I.0 Chapter Introduction

Contract Pricing Environment. An important part of your job as a contract specialist is to conduct the price analyses necessary to ensure that the Government purchases supplies and services from responsible sources at fair and reasonable prices. To begin your study of contract pricing, we will examine the pricing environment, including:

- Definitions of price;
- Seller pricing objectives and approaches;
- The Government pricing objective;
- Government approaches to contract pricing; and
- Potential participants in the acquisition process

Definitions of Price. From both work and personal business dealings, most people think of price as the amount of money that a buyer pays a seller for the delivery of a product or the performance of a service. The FAR definition of price (FAR 15.401) emphasizes its components: Cost plus any fee or profit applicable to the contract type.

Both definitions of price are important. Primarily, price is defined as the amount the buyer pays for a product or service. However, it is important to remember that, if prices do not cover supplier costs and provide a profit, losses will occur. When a contract is priced below cost, performance risk increases. The contractor must finance contract performance with funds from other sources (e.g., profits from other contracts, financial reserves, or overpriced contract modifications). If contractor efforts to control costs result in unsatisfactory performance, contractor default is a real possibility.

I.1 - Identifying The Seller's Pricing Objectives And Approaches This section covers the following topics:

- I.1.1 - Identify Seller’s Pricing Objectives
- I.1.2 - Identify Seller’s Approaches To Pricing
- I.1.3 - Review Seller’s Cost-Based Pricing Strategies
- I.1.4 - Review Seller’s Market-Based Strategies

Pricing Perspectives. Buyers and sellers look at the same price from different perspectives. Each party to a sales transaction has unique pricing objectives. As a contract specialist, you should be aware that:

- Sellers in different markets often have different approaches to contract pricing.
- Different sellers in the same market may have different pricing objectives and approaches.
- A single firm may have different objectives and approaches in different contracting situations.

I.1.1 - Identify Seller’s Pricing Objectives

Pricing Objectives. To sellers, contract pricing has two primary, related objectives:

- To cover costs; and
- To contribute to attaining corporate operational objectives.

Cover Costs. Many firms would have us believe that they lose money on every unit they sell, but make up for it in volume. Unfortunately, business does not work that way. A seller may accept a loss on a particular contract or group of contracts, but a firm that consistently fails to cover its costs cannot survive.

Operational Objectives. All firms have several operational objectives that serve as benchmarks for business decisions. In the best firms, they are usually clearly defined and tailored to the market decisions. In other firms, they may be less clear.

Common objectives include:

- Short-term and/or long-term profitability;
- Market share;
Long-term survival;
Product quality;
Technological leadership; and
High productivity.

To attain its operational objectives, a firm must cover its costs and earn an overall profit. Some products may sell for less than cost, but if they do, other products must make sufficient profit to compensate for those losses. Profits are essential for:

- Investment;
- Product Development;
- Productivity Improvement;
- Retirement of Debt Principal; and
- Rewarding Investors.

### I.1.2 Identify Seller’s Approaches To Pricing

**Seller’s Pricing Approaches.** In product pricing, sellers commonly use one of two basic approaches -- cost-based pricing or market-based pricing. The following are common strategies associated with each approach:

**Cost-based pricing:**
- Mark-up pricing
- Margin on direct cost
- Rate-of-return pricing

**Market-based pricing:**
- Profit-maximization pricing
- Market-share pricing
- Market skimming
- Current-revenue pricing
- Promotional pricing
- Demand-differential pricing
- Market-competition pricing

### I.1.3 Review Seller’s Cost-Based Pricing Strategies

This subsection covers the following topics:

- I.1.3.1 - Mark-Up Pricing
- I.1.3.2 - Margin On Direct Cost
- I.1.3.3 - Rate-of-return Pricing

**General Approach.** The cost-based pricing approach to pricing involves an analysis of a firm's cost to produce a product, and the addition of a reasonable profit to determine the selling price. Seller cost will depend on many factors including production methods and product sales volume. The seller's definition of a reasonable profit will also depend on many factors, including:

- Competition;
- Objectives of the firm;
- Necessary investment; and
- Risk involved.

**Cost-based Pricing Strategies.** How is profit calculated and applied? There are three basic strategies:

- Mark-up pricing;
- Margin pricing; and
- Rate-of-return Pricing.

### I.1.3.1 Mark-up Pricing

**Definition.** Mark-up pricing is the establishment of prices based on estimated direct cost or total cost plus a percentage mark-up. If the base is direct cost, the mark-up covers profit plus indirect costs (i.e., overhead and general and administrative costs). If the base is total cost, the mark-up only covers profit.
Procedure. To understand mark-up pricing, you must understand the steps followed by a firm when using the technique:

- Estimate the sales volume.
- Estimate product unit cost at the estimated sales volume.
- Determine the mark-up rate to be used.
- Calculate unit selling price by applying the mark-up rate to the product cost.

Example. Price the following product using straight mark-up pricing:

**Given:**
- Estimated Sales Volume = 1,000 units
- Estimated Unit Cost = $80
- Mark-up Rate = 20%

**Calculate Unit Selling Price:**

\[
\text{Unit Selling Price} = \text{Cost} + (\text{Mark-Up Rate} \times \text{Cost})
\]

\[
= $80 + (0.20 \times $80)
\]

\[
= $80 + $16
\]

\[
= $96
\]

**Strategy Implications for Buyers** Profit is set using a mark-up rate that is simply a percentage of direct or total cost. That rate depends on:

- Market Factors. The product line, tradition, competition, and other market factors will affect the mark-up rate. Investment required to produce the product is not normally one of the factors considered in setting a mark-up rate. Similar products are typically priced using similar mark-up rates. However, a new state-of-the-art product will typically be priced using a higher mark-up rate than a similar older product that has been on the market for a long time.

- Cost Base Used in Applying the Rate.
  - Mark-Up on Direct Cost. A firm that bases its mark-up on direct cost will have a higher mark-up than the firm that bases the mark-up on full cost. Why? Because a mark-up based on direct cost must cover overhead costs, as well as profit. A mark-up rate of 100 percent or more may be quite reasonable.
  - Mark-Up on Total Cost. A firm that bases its mark-up on full costs should have a lower mark-up rate than the firm that bases the mark-up on direct cost only. A mark-up rate of 100 percent on full cost would normally be considered excessive.

The use of mark-up pricing varies by:

- Industry. Mark-up pricing is particularly common in industries where customers are expected to negotiate sales price (e.g., automobiles). The profit represented in the mark-up is set high enough to provide the seller with room to compromise. Hence, a good buyer should be aware of relevant industry mark-up practices. Knowledge of prevailing mark-ups can be a tremendous advantage in negotiating reasonable prices.
- Product. Mark-up pricing is particularly common for unique items or services provided for a single customer or a small group of customers. The mark-up will commonly vary based on the type of work and risk involved.

### I.1.3.2 Margin Pricing

**Definition.** Margin pricing is similar to mark-up pricing in that price is based on the relationship between cost and profit. Margin pricing based on direct costs must cover both indirect cost and profit. Margin pricing based on total cost must only provide for profit. Instead of adding a mark-up based on a percentage of cost, margin pricing uses cost to calculate a price that will provide a profit margin that is an established percentage of price. Many commercial firms use this technique because it matches their accounting reports where costs and profits are reported as a percentage of sales.

**Procedure.** Use the following steps to calculate price based on the margin on direct cost pricing technique:

- Estimate the sales volume.
- Estimate cost at the estimated sales volume.
- Determine the margin rate to be used.
Calculate the selling price by applying the margin rate to the product cost.

*Example.* Price the following product using margin pricing:

**Given:**  
Estimated Sales Volume = 1,000 units  
Estimated Unit Cost = $81  
Margin Rate = 40%

**Calculate Unit Selling Price:**  
Unit Selling Price = Cost/(1 - Margin Rate)  
= $80/(1 - .40)  
= $80/.60  
= $133

*Strategy Implications for Buyers.* Like mark-up rates, margin rates depend on the product line, tradition, and competition. Similar products are priced using similar mark-up rates. A firm’s management is often rated by the margin rate that they can obtain. You should be aware of relevant industry mark-up practices. Knowledge of prevailing margins can be a tremendous advantage in negotiating reasonable prices, especially when buying in commercial markets.

I.1.3.3 Rate-Of-Return Pricing

*Definition.* Rate-of-return pricing is similar to mark-up pricing in that profit dollars are added to estimated costs. However, profit dollars are not calculated based on the cost of labor and material required to provide the product. Instead, profit is calculated based on the financial investment required to provide the product, the return needed to attract that investment, and estimated sales volume.

*Procedure.* Follow these steps to determine profit using rate-of-return pricing:

- Determine desired rate of return on investment.
- Estimate investment required.
- Estimate level of sales.
- Estimate unit cost at the projected sales level.
- Calculate desired unit profit.
- Calculate unit selling price (estimated cost + desired profit).

Price the following product using rate-of-return pricing:

**Given:**  
Desired Rate of Return = 15%  
Estimated Investment Required = $600,000  
Estimated Sales = 5,000 units  
Estimated Unit Total Cost = $80

**Calculate Unit Selling Price:**  
Calculate Desired Unit Profit = (15% * $600,000)/5,000 Units = $90,000/5,000  
= $18 per unit  
Calculate Unit Selling Price = $80 + $18  
(Unit Cost + Unit Profit) = $98

*Strategy Implications for Buyers.* Firms that use this method of pricing are probably more sensitive to changes in overall sales volume than firms using the other cost-based pricing methods. They are concerned about the rate of return, not just a mark-up or margin rate. A lower item price coupled with a higher sales volume can actually increase the rate of return. On the other hand, a higher item price coupled with a lower sales volume can decrease the rate of return. You should be aware of the investment required to make different products. Any action that enables the seller to reduce its investment or spread that investment over more products should reduce the profit that must be earned on any one product to maintain a required rate of return on investment.

I.1.4 - Review Seller’s Market-based Pricing Strategies

In a competitive market, the seller must consider the four "P"s of marketing: price, product, place, and promotion. Firms must develop pricing strategies to accomplish overall marketing objectives based on their assessment of market conditions (e.g., forecasts of supply and demand) and the economic condition.
of the business entity. This section covers the following market-based pricing strategies which can be used in various market conditions:

- **I.1.4.1 - Profit-Maximization Pricing**
- **I.1.4.2 - Market-Share Pricing**
- **I.1.4.3 - Market Skimming**
- **I.1.4.4 - Current-Revenue Pricing**
- **I.1.4.5 - Promotional Pricing**
- **I.1.4.6 - Demand-Differential Pricing**
- **I.1.4.7 - Market-Competition Pricing**

### I.1.4.1 Profit-Maximization Pricing

**Definition.** In profit-maximization pricing, the seller assumes that demand falls as prices increase and grows as prices decrease. A firm using this strategy carefully analyzes the market to find the combination of price per unit and quantity of sales that maximizes profit.

**Strategy.** When employing this strategy, the seller considers the following questions:

- Is demand sensitive to price changes?
  - As price increases, does demand decrease?
  - As price decreases, does demand increase?
- What is the point of profit maximization?
  - This is determined through analysis of the relationship between price and demand.

This pricing strategy is:

- **Most effective** in situations where:
  - Price is an important marketing factor affecting demand.
  - Competitors react relatively slowly to price changes.
  - Actual relationships between price and customer demand can be effectively estimated.
- **Least effective** when competitors react rapidly to price changes.

**Strategy Implications for the Buyer**

Be aware of the relationship between price and quantity in the marketplace. Working with users to take advantage of price breaks can save the Government substantial sums of money.

In Government contracting, the purchase quantity estimates are generally fixed, based on the needs of the Government. No matter how low the offeror's price, the quantity acquired by the Government does not change. Thus there is no advantage to the offeror to offer a price lower than that necessary to win the contract.

Prices for multiple-award Federal Supply Schedules are a possible exception. Another possible exception are prices for inventory items, when the amounts ordered by inventory managers vary from one period to the next based in part on price/quantity tradeoffs.

### I.1.4.2 Market-Share Pricing

**Definition.** Market-share pricing is based on the assumption that long-run profitability is associated with market share. When using this strategy, the goal is to dominate the market through market penetration. Firms set prices relatively low to win customers and discourage competition. Early losses may occur, but as volume increases, cost per unit decreases and long-term profits are achieved.

**Strategy.** When employing this strategy, the seller normally attempts to:

- Build efficient operations;
- Set price at or below competitors' prices to win market share; and
- Lower prices as costs fall.

**Strategy Implications for the Buyer.** As a buyer, you should encourage mass production efficiencies that may reduce contractor costs and provide a reasonable profit. The Model T Ford is one example of a situation where a firm's use of this strategy generally benefited customers. Ford drove down prices to reach more customers. Other competitors were forced to reduce prices or offer product improvements to stay in the market.

You should discourage a contractor "buy-in," (i.e., bid below cost to win a contract and exclude others from the market) when there is evidence that the contractor may jeopardize contract performance
because the contract price will not cover costs. You should be particularly concerned when sellers:

- Have limited financial resources, or
- Are apparently gambling on capturing a larger share of the market (and of unit sales) than they are likely to achieve.

I.1.4.3 Market Skimming

**Definition.** In market skimming, prices are set to achieve a high profit on each unit by selling to buyers who are willing to pay a higher price for a product of perceived higher value. After the demand of these buyers is satisfied, or competitors produce similar products at lower prices, prices may be reduced to increase volume and maintain overall profitability.

**Strategy.** When employing this strategy, the seller considers the following points:

- Establish a high price to achieve a high profit margin at relatively low volume.
- Decrease price over time to attract buyers not willing to pay the price premium.

Personal computers are good examples of this strategy:

- Prices remained relatively high for years;
- Firms catered to buyers willing to "pay for the best"; and
- As quality competition increased, prices began to decrease.

**Strategy Implications for the Buyer.** As a buyer, you should resist user attempts to "pay for the best" when the "best" is more than the Government needs or the perception of quality is based more on superior marketing than on a superior product.

Remember the "best product" is not always the best value. To be the best value, the perceived benefits of a higher-priced product must merit the higher price. For example, a stainless steel screw may be the best product, but the quality does not justify the higher price when the screw will be used in constructing a wooden cabinet.

You should encourage attempts at source development to increase competition and control prices.

I.1.4.4 Current-Revenue Pricing

**Definition.** In current-revenue pricing, the emphasis is on maximization of current revenue rather than profit or long-term revenue. Firms using this strategy are typically concerned about long-term market uncertainty or the firm's financial instability. To them, a sure dollar today is much more important than the possibility of more dollars tomorrow.

**Strategy.** When employing this strategy, the seller must determine the price/quantity combination that maximizes revenue.

**Strategy Implications for the Buyer.** You need to be aware that this strategy predominates when risk is high. Action to reduce risk will likely be rewarded with lower prices and a more stable business environment.

Consider long-term demand for the product. Firms pricing product crazes, like the "hula hoop," are likely to consider current-revenue pricing.

- Demand is high one day, but may disappear the next.
- Near-term cash recovery is more important than long-term profitability.

Assure that all contractors are responsible. Firms with limited financial resources may employ this strategy.

- If near-term cash needs are not met, there will be no long term for the firm.
- Unfortunately, concentration on the near-term may also jeopardize the long-term future of the firm.

I.1.4.5 Promotional Pricing

**Definition.** In promotional pricing, products are priced to enhance the sales of the overall product line rather than to assure the profitability of each product.

**Strategy.** When employing this strategy, the seller considers the following points:

- Determine whether selling a product at a loss (a loss leader) will increase the sale of related products and increase profit.
- Determine whether selling a product at a high (prestige) price will improve the product-
line quality image and increase profit.

*Strategy Implications for the Buyer.* This strategy can be used for pricing a wide range of consumer and industrial products, from groceries to electronics and services. Government personnel evaluating offers for a delivery-order or task-order contract with multiple line items should be particularly alert to offers prepared using this strategy.

Promotional contracting can take many forms:

- Bait and switch pricing can be particularly attractive to a firm preparing an offer for a delivery-order contract with multiple line items. An offeror using this strategy lures the buyer using a low-priced item (e.g., a low labor rate for a particular labor category) and then switches the buyer to a "better" item (e.g., a higher-priced category of labor) during the sale.
- Loss-leader can be attractive in situations where many items are commonly bought from the same source. An offeror using this strategy reduces the price of one, or a group of items, to near cost, or even below. Customers are attracted to buy the low-priced items and buy other related items at the same time (e.g., set the price of a system low and the price of supplies for the system high).
- Prestige pricing uses a high-quality, high-priced item to enhance the image of an entire product line and attract more buyers. For example, many consultants feel that buyers are reluctant to buy from firms that do not charge enough. In other words, it can be almost impossible to evaluate qualifications so high price equals high quality.

### I.1.4.6 Demand-Differential Pricing

*Definition.* In demand-differential pricing, products or services sold in different market segments are priced in a way that is not consistent with the marginal costs related to segment differences.

*Strategy.* When employing this strategy, the seller considers the following points:

- Identify the segmentation factors that may affect pricing:
  - Customer;
  - Product Form;
  - Place; and
  - Time.
- Determine the demand intensity in each segment.
- Identify actual and potential competitors.
- Assure that demand-differential will not breed customer resentment.

*Strategy Implications for the Buyer.* You need to be aware of the effect of the various segmentation factors on different products.

- Customers may pay different prices based on buying power or negotiation skills-for example, automobile purchases. In addition, different classes of customers (e.g., wholesalers, retailers, and governments) may pay different prices.
- Product-form (e.g., electronic component assembly) may warrant a price higher than the price of the components plus assembly.
- Location of the sales transaction may affect price. The price of an item sold in New York may be substantially greater than the price of the item in Ohio plus the shipping charge to New York.
- Time may affect pricing, particularly in industries that have substantial fixed investment and identifiable peaks in demand. Utilities, for example, offer lower prices for service during "off-peak" hours.

### I.1.4.7 Market-Competition Pricing

*Definition.* In market-competition pricing, emphasis is on competitive action/reaction to pricing actions that competitors have taken or are expected to take. Firms following this pricing strategy in relatively homogeneous markets establish prices based on what the competition charges or what they think the competition is going to charge.

*Strategy.* You may find that different companies may set prices at a level that keeps pace with competitor's prices. When employing this strategy, the seller considers the following points:
• Determine competitor prices and/or anticipated prices.
• Set price to keep pace with competitor prices.

Major strategy applications include sealed-bid and going-rate pricing.

• Sealed-bid pricing forces the seller to:
  o Estimate what competitors will bid
  o Determine what the seller can profitably bid
  o Submit the bid knowing that it will be accepted or rejected without further discussion

• Going-rate pricing requires the seller to:
  o Determine what competitors are charging
  o Establish product price within an established range of the competition

**Strategy Implications for the Buyer.** Government policy on competition and market pricing is designed to encourage sellers to establish prices using market-competition pricing. You need to remember that this is only one method of market pricing. Many firms are reluctant to compete in a market where success is achieved by low price alone.

### I.2 Identifying Government’s Pricing Objectives

This section covers the following topics:

• I.2.1 - Pay A Fair And Reasonable Price
• I.2.2 - Price Each Contract Separately
• I.2.3 - Exclude Contingencies

**Government Pricing Objectives.** When buying for the Government, your primary pricing objective for all contract actions is to acquire supplies and services from responsible sources at fair and reasonable prices.

When awarding contracts through the negotiated procedures of FAR Part 15, you must also (see FAR 15.402(a), (b), and (c)):

- Price each contract separately and independently and not:
  1. Use proposed price reductions under other contracts as an evaluation factor or
  2. Consider losses or profits realized or anticipated under other contracts.
- Not include in a contract price any amount for a specified contingency to the extent that the contract provides for price adjustment based upon the occurrence of that contingency.

#### I.2.1 - Pay A Fair And Reasonable Price

**Understand Fair and Reasonable.** The first element of the Government pricing objective requires that contract prices be fair and reasonable.

Under the FAR, the contracting officer’s primary objective in pricing a contract is to balance the contract type, cost, and profit or fee negotiated to achieve a total result -- a price that is fair and reasonable to both the Government and the contractor. **[The contracting officer must consider the terms and conditions (delivery, financing, etc.) of each specific contract in order to determine if the price for that contract is fair and reasonable.]**

The FAR does NOT define the term “fair and reasonable price,” but it implies two tests:

- What is fair?
- What is reasonable?

**What Is Fair?** Buyers and sellers may have different perceptions on what price is fair.

1. **Fair to the Buyer.** To be fair to the buyer, a price must be in line with (or below) either of the following:
   - The fair market value of the contract deliverable (if that can be ascertained through price analysis). Expect to pay the fair market value, given the prices of market transactions between informed buyers and sellers under similar competitive market conditions for deliverables with similar product, quality, and quantity requirements.
   - The (1) total allowable cost of providing the contract deliverable that would have been incurred by a well managed, responsible firm using reasonably efficient and economical methods of performance plus (2) a reasonable profit.

As a buyer, you should consider a price that is TOO HIGH to be unfair. What happens if you agree to a price that is too high?

- You will have failed to fulfill your most basic responsibility as a Government contracting
officer or contract specialist.
- You will waste scarce Government funds.
- Since you are publicly accountable as a Federal employee for your decisions, you may have to answer to management, the Inspector General, the General Accounting Office, a Congressional committee, or the public at large.

2. Fair to the Seller. To be fair to the seller a price must be realistic in terms of the seller's ability to satisfy the terms and conditions of the contract.
- **Risk of Prices Unfair to the Seller.** Why should you care if a low offer is unrealistic? Because an unrealistic price puts both parties at risk. The risk to the Government is that the firm -- to cut its losses -- might:
  - Cut corners on product quality;
  - Deliver late;
  - Default, forcing a time-consuming reprocurement; or
  - Refuse to deal with the Government in the future or be forced out of business entirely.

*Situations for Special Consideration.* Fairness to the seller can be a concern in both competitive and noncompetitive situations.
- **Below-Cost Prices.** Below-cost prices are NOT necessarily unfair to the seller. A bidder, for various reasons, in its business judgment may decide to submit a below-cost bid; such a bid is not invalid. Whether the awardee can perform the contract at the price offered is a matter of responsibility.
  - On the other hand, be on guard against the practice of buying-in -- submitting offers below anticipated costs, expecting to:
    - Increase the contract amount after award (e.g., through unnecessary or excessively priced change orders); or
    - Receive follow-on contracts at artificially high prices to recover losses incurred on the buy-in contract.
    - FAR 3.501 presents a number of techniques to prevent a contractor from recovering buy-in losses. It also refers you to FAR 15.405 for guidance on treatment of unreasonable price quotations. That portion of the FAR (among other things) advises contracting officers to consider risks to the Government represented by the proposed contract type and price.
- **Mistakes.** The offered price may be unexpectedly low because the seller has made gross mistakes in estimating costs or is otherwise nonresponsible.
  - The award of a contract to a supplier based on lowest evaluated price alone can be false economy if there is subsequent default, late deliveries, or other unsatisfactory performance resulting in additional contractual or administrative costs. While it is important that Government purchases be made at the lowest price, this does not require an award to a supplier solely because that supplier submits the lowest offer. A prospective contractor must affirmatively demonstrate its responsibility, including, when necessary, the responsibility of its proposed subcontractors.
  - If a vendor offers a price that is far below other offered prices or your estimate of the probable price, treat the offer as a potential mistake. In such cases, both FAR Part 14 and Part 15 authorize fact-finding to determine whether the offeror understands the work and can perform at the offered price.
- **Single-Source Procurements.** Do NOT force a below-cost price on the offeror even if you believe that the offeror has the financial ability to absorb the probable loss. Instead, negotiate a contract of a type and a price that is likely to cover all allowable costs of performance, assuming reasonable economy and efficiency, and provide a reasonable profit (consistent with FAR profit policies). Even your opening position in non-competitive negotiations should NOT be a “below cost” number. Rather, your opening position should be based on a more optimistic reading of the potential production improvements, risks, and costs of providing the contract deliverable than that of the target position on price.

*What Is Reasonable?* A **reasonable price** is a price that a prudent and competent buyer would be willing to pay, given available data on:
- Market Conditions. Economic forces such as supply, demand, general economic conditions, and competition change constantly. Hence, a price that is reasonable today may not be
reasonable tomorrow.

○ **Supply and Demand.** The forces of supply and demand can have a significant effect on product prices:
  ○ If demand is constant, decreasing supply usually results in higher prices, while increasing supply usually results in lower prices.
  ○ If supply is constant, decreasing demand usually results in lower prices, while increasing demand usually results in higher prices.

○ **General Economic Conditions.** General economic conditions affect the prices of all products, but the effect will NOT be the same for every product. Inflation and deflation affect the value of the dollar. Boom, recession, and depression affect available production capacity.

○ **Competition.** When competition does not exist, the forces of supply and demand may not work effectively. The buyer or seller may have an advantage in the pricing decision process.

- Markets can be defined by considering: the number of buyers, the number of sellers, product homogeneity, and ease of market entry and exit.
- The buyer's relative pricing power compared with that of sellers changes in different market situations. The table below examines the relative pricing in each situation:

<table>
<thead>
<tr>
<th>Level</th>
<th>Buyers</th>
<th>Sellers</th>
<th>Market Entry/Exit</th>
<th>Relative Pricing Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfect Competition</td>
<td>Many independent</td>
<td>Many independent</td>
<td>Relatively easy</td>
<td>Pricing balance between buyers and sellers</td>
</tr>
<tr>
<td>Effective Competition</td>
<td>Limited independent</td>
<td>Limited independent</td>
<td>Relatively easy</td>
<td>Relative pricing balance between buyers and sellers</td>
</tr>
<tr>
<td>Oligopoly</td>
<td>Many independent</td>
<td>Few independent</td>
<td>Restrictions</td>
<td>Relatively greater pricing advantage to sellers</td>
</tr>
<tr>
<td>Oligopsony</td>
<td>Few independent</td>
<td>Many independent</td>
<td>Relatively easy</td>
<td>Relatively greater pricing power to buyers</td>
</tr>
<tr>
<td>Monopoly</td>
<td>Many independent</td>
<td>One</td>
<td>Restrictions</td>
<td>Considerable pricing power to sellers</td>
</tr>
<tr>
<td>Monopsony</td>
<td>One</td>
<td>Many independent</td>
<td>Relatively easy</td>
<td>Considerable pricing power to buyers</td>
</tr>
<tr>
<td>Bilateral Monopoly</td>
<td>One</td>
<td>One</td>
<td>Restrictions</td>
<td>Pricing power established by negotiation (as in sole source Government negotiation)</td>
</tr>
</tbody>
</table>

**Alternatives for Meeting the Requirement.** In making any acquisition, you should consider the alternatives. In a competitive acquisition, you should first consider how an offered price compares with competitive offers. However, your analysis should NOT end there. You should also consider other alternatives for acquiring the product or service. For example, sealed bidding procedures permit the agency head to cancel a solicitation when otherwise acceptable bids are at unreasonable prices (FAR 14.404-1(c)(6)) and negotiation procedures permit the source selection authority to reject all proposals if doing so is in the best interest of the Government (FAR 15.305(b)).

**Price-Related Evaluation Factors.** A prudent buyer will consider differences in the cost of acquiring and owning a deliverable that are not covered by the contract price. To consider these price-related factors in a competitive acquisition, the solicitation must provide for such consideration. For example:

- **Direct Costs Not Included in The Contract Price.** The solicitation allowed offers to submit offers either for f.o.b. destination or f.o.b. origin. FAR requires that offer evaluation criteria provide for consideration of the shipping costs from f.o.b. origin points to destination.

- **Costs of Ownership Not Included in The Contract Price.** Your market research indicates that several products could satisfy your requirement. However, the products differ substantially in maintenance and repair costs. Offer evaluation criteria should provide for consideration of the related costs to the Government.

- **Costs of Contract Award and Administration.** In a competitive contracting situation,
you may solicit line item prices and an aggregate price for all solicitation line items. The contracting officer could split the line items among five offerors, or award all line items to the single firm that offered the lowest aggregate price. To determine which method of award would provide the best value to the Government, offer evaluation criteria must provide for consideration of cost to the Government for awarding and administering multiple contracts (e.g., see FAR 14.201-6(q)).

Noncompetitive Acquisitions. In a noncompetitive acquisition, you should be alert to potential risks and costs NOT covered in the offered price. A price that seems reasonable on the surface may be unreasonable if proposed terms and conditions shift costs to the Government. For instance, an offered price may seem reasonable until you discover that the proposed terms and conditions have shifted responsibility for furnishing the necessary tooling from the firm (per the RFP) to the Government (per the proposal). Likewise, a contractor's proposed price, regardless of amount, might be unreasonable if conditioned on the use of a cost-reimbursement contract that transfers an inappropriate portion of the risk of cost growth to the Government.

Non-Price Evaluation Factors. In some acquisitions, the test of reasonableness requires a trade-off analysis between price, price-related factors, and non-price factors such as past performance and relative technical capabilities of the competing firms (see FAR 15.101-1). In particular, do NOT compete cost-reimbursement contracts primarily on the basis of lowest proposed costs. That would only encourage offerors to submit unrealistically low estimates and increase the likelihood of cost overruns (see FAR 15.404-1(d)).

Applying Judgment to the Determination.
Your determination of whether an offer is fair and reasonable is a matter of judgment. There is no simple formula in which you can just plug in a few values and receive a firm answer of fair and reasonable. Determining what is fair and reasonable depends on market conditions, your alternatives for meeting the requirement, price-related factors, and the non-price evaluation factors that relate to each procurement. It also depends on what price you can negotiate with an offeror. FAR 15.405(a) states that: A fair and reasonable price does not require that agreement be reached on every element of cost, nor is it mandatory that the agreed price be within the contracting officer's initial negotiation position. Taking into consideration the advisory recommendations, reports of contributing specialists, and the current status of the contractor's purchasing system, the contracting officer is responsible for exercising the requisite judgment needed to reach a negotiated settlement with the offeror and is solely responsible for the final price agreement.

There may be times when you find it impossible to reach agreement on a price that you consider fair and reasonable. If that happens, follow the FAR guidance at FAR 15.405(d). If, however, the contractor insists on a price or demands a profit or fee that the contracting officer considers unreasonable, and the contracting officer has taken all authorized actions (including determining the feasibility of developing an alternative source) without success, the contracting officer shall refer the contract action to a level above the contracting officer. Disposition of the action should be documented.

I.2.2 Price Each Contract Separately
The second element of the Government pricing objective requires that contracts be priced separately. FAR 15.402(b).

Perspective. It is human nature to try to balance one contract against another in terms of financial results.

- A seller's position might be that the firm lost money on the last contract; therefore, an effort should be made to make up for that loss on the next contract.
- A buyer's position might be that the contractor made too much profit on the last contract; therefore, the next contract should be structured to restrict profit.

Government Contracting. While these attitudes may be understandable in a personal sense, they are not valid in Government contracting.

Government contracting is very complex because:

- Buyers and sellers do not have perfect knowledge of all transactions between a contractor and the Government.
- The market forces of competition, supply, and demand change.
- Business conditions change.

Thus, you must price each contract separately and independently to ensure that all proposed prices are
fair and reasonable to all involved parties.

I.2.3 Exclude Contingencies
The third element of the Government pricing objective requires that contracts exclude contingencies that CANNOT be reasonably estimated at the time of award FAR 15.402(c).

Contingency Definition. A contingency is a possible future event or condition arising from presently known or unknown causes, the outcome of which is not determinable at the present time.

Types of Contingencies. (see FAR 31.205-7) You should know that there are two types of contingencies that are important in Government contracting:

- Contingencies that may arise from presently known and existing conditions, the effects of which are foreseeable within reasonable limits of accuracy; and
- Contingencies that may arise from presently known or unknown conditions, the effects of which CANNOT be measured so precisely as to provide equitable results to the contractor and the Government

Pricing Decision. The following table shows you how to handle each type of contingency in terms of the contract price:

<table>
<thead>
<tr>
<th>Contingency</th>
<th>Examples</th>
<th>Contract Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreseeable within</td>
<td>Cost of rejects; Cost of defective work</td>
<td>Contingencies of this type should be included in contract cost estimates to make those estimates as accurate as possible.</td>
</tr>
<tr>
<td>reasonable limits of accuracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANNOT be measured so</td>
<td>Results of pending litigation; Costs of</td>
<td>Contingencies of this type should be excluded from the cost estimates under the several items of cost, but should be disclosed separately (including the basis on which the contingency is computed) to facilitate the negotiation of appropriate contract coverage.</td>
</tr>
<tr>
<td>precisely as to provide</td>
<td>volatile material price changes</td>
<td></td>
</tr>
<tr>
<td>equitable results to the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contractor and to the Government</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For example, if you have extensive production experience with a given product, the contractor and the Government can likely agree on the amount of scrap that can reasonably be expected during production. This type of contingency should be included in contract cost estimates.

On the other hand, in times of volatile material price changes, it would be unreasonable to both parties for an offeror to include a contingency to cover significant price increases when none may occur. In this situation, you should consider use of a contract type (e.g. fixed-price economic price adjustment) that provides for separate consideration of volatile price changes. Separate consideration will provide for better contract pricing and more effective competition.

I.3 Identifying Government Approaches To Contract Pricing
This section covers the following topics:

- I.3.1 - Identify Price Analysis Considerations
- I.3.2 - Identify Cost Analysis Considerations
- I.3.3 - Identify Cost Realism Analysis Considerations

Approaches to Determine Fair and Reasonable Prices (FAR 15.402)
As a contract specialist, your primary objective as a Government buyer is to acquire supplies and services from responsible sources as fair and reasonable prices. You can use three basic approaches to attain this objective:

- Price analysis;
- Cost analysis; and
- Cost realism analysis.

In this section, you will learn about each of these approaches, how it is defined, when it is used, and key elements to consider.
I.3.1 Identify Price Analysis Considerations

*Definition of Price Analysis.* Price analysis is the process of examining and evaluating a proposed price to determine if it is fair and reasonable, without evaluating its separate cost elements and proposed profit. Price analysis may be, when necessary, supplemented by evaluation of cost elements.

*When to Use Price Analysis.* When an offeror is not required to provide cost or pricing data, you must use price analysis to ensure that the overall price is fair and reasonable. When an offeror is required to provide cost or pricing data, use cost analysis to evaluate the reasonableness of individual cost elements. Use price analysis to verify that the overall price offered is fair and reasonable.

*Bases for Price Analysis.* Price analysis **always** involves some form of comparison with other prices. As the contracting officer, you are responsible for selecting the bases for comparison that you will use in determining if a price is fair and reasonable, such as:

- Proposed prices received in response to the solicitation;
- Commercial prices including competitive published price lists, published commodity market prices, similar indexes, and discount or rebate arrangements;
- Previously-proposed prices and contract prices for the same or similar end items, if you can establish both the validity of the comparison and the reasonableness of the proposed price;
- Parametric estimates or estimates developed using rough yardsticks;
- Independent Government Estimates; or
- Prices obtained through market research for the same or similar items (Because market research can span commercial prices, previously-proposed prices, contract prices, parametric or rough yardstick estimates, and Independent Government Estimates, this base for price analysis will not be considered separately in the remainder of this text.)

The order in which the bases for price analysis are presented on this list represents the general order of desirability. However, the order is **NOT** set in concrete. For example:

- Comparisons with commercial catalog, market, or regulated prices can be just as desirable as comparisons with competitive offers. After all, the prices of commercial products are defined by commercial market competition.
- Independent Government estimates are normally considered to be the least desirable comparison base for price analysis. However, in cases (e.g., construction) where estimates are based on extensive detailed analysis of requirements and the market, the Government estimate can be one of the best bases for price analysis.

Moreover, you should use all bases for which you have recent, reliable, and valid data. For instance, you would be well advised to consider the last price paid in addition to current competitive prices — especially if the prior contract was awarded at a reasonable price last month.

*Buyer Evaluation and Documentation.* Price analysis is a subjective evaluation. For any given procurement, different bases for price analysis may give you a different view of price reasonableness. Even given the same information, different buyers/contracting officers might make different decisions about price reasonableness.

It is the cognizant contracting officer who must be satisfied that the price is fair and reasonable. You must document the file concerning the rationale used in making the pricing decision. Otherwise, the individuals who may review your file later may not know or understand the factors that affected your decision.

I.3.2 Identify Cost Analysis Considerations

*Definition of Cost Analysis.* Cost analysis is the review and evaluation of the separate cost elements and proposed profit/fee of:

- An offeror’s or contractor’s cost or pricing data or information other than cost or pricing data and
- The judgmental factors applied in projecting from the data to the estimated costs.

The purpose of the evaluation is to form an opinion on the degree to which the proposed costs represent what the cost of the contract should be, assuming reasonable economy and efficiency.

*When to Use Cost Analysis.* Perform cost analysis in **either** of the following situations:
When the Truth in Negotiations Act (TINA) applies and the offeror is required to submit cost or pricing data. In this situation, the offeror must provide complete, accurate, and current data to support all proposed costs and profit/fee.

When you require an offeror to submit cost information other than cost or pricing data to support your decision on price reasonableness or cost realism. In this situation, require only the information necessary to determine price reasonableness or cost realism. This may be required, for example, when you are comparing a proposed price to a price previously paid on a similar item. You may need cost information from the contractor to determine the impact, on the price, of the differences between the two items.

**Definition of Contract Cost.** Contract cost is the sum of the allowable **direct and indirect costs** allocable to a particular contract, incurred or to be incurred, less any allocable credits, plus any allocable cost of money.

**Direct cost** is any cost that can be identified specifically with a final cost objective, such as a contract.

**Indirect cost** is any cost that CANNOT be directly identified with a single, final cost objective, but is identified with two or more final cost objectives or an intermediate cost objective.

For reasons of practicality, any direct cost of minor dollar amount may be treated as an indirect cost if the accounting treatment is consistently applied to all cost objectives and the treatment produces substantially the same results as treating the cost as a direct cost.

**Definition of Profit/Fee.** Profit/fee is the dollar amount **over and above allowable costs** paid to the contractor to motivate contractor performance. Together contract cost and contract profit/fee total contract price. Thus contract profit is an important element of contract price and must be considered in cost analysis. Each agency must establish a structured approach for analysis of proposed profit/fee.

**Identifying Contract Costs.** Not all contract costs are cash expenditures during the contract period. Major contract costs can fall in the following categories:

- **Cash expenditures** - the actual outlay of dollars in exchange for goods or services.
- **Expense accrual** - expenses are recorded for accounting purposes when the obligation is incurred, regardless of when cash is paid out for the goods or services.
- **Draw down of inventory** - the use of goods purchased and held in stock for production and/or direct sale to customers. The term refers to both the number of units and the dollar amount of items drawn out of inventory.

For example, both direct and indirect costs can result from a draw down of inventory and many indirect costs are accrual expenses.

**Type of Contract Cost**

<table>
<thead>
<tr>
<th>Type of Contract Cost</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash expenditure</td>
<td>Payment by cash, check, or electronic funds transfer to a vendor for raw materials.</td>
</tr>
<tr>
<td>Expense accrual</td>
<td>Incurring of an obligation in the current year to pay an employee a retirement pension at some point in the future.</td>
</tr>
<tr>
<td>Draw down of inventory</td>
<td>Electronic components purchased in large volume against anticipated total demand and held in inventory until drawn out to fill a specific order. While the components were paid for in the past, the drawing out of a component to meet a contract need is a reduction of the assets of the firm and therefore a cost to the contract.</td>
</tr>
</tbody>
</table>

**Cost Analysis Supplements Price Analysis.** Cost analysis is not a substitute for effective price analysis. Cost analysis should provide insight into what it will cost the firm to complete the contract using the methods proposed. However, cost analysis does not necessarily provide a picture of what the market is willing to pay for the product involved. For that you need price analysis.

**For example,** suppose that you wanted to procure a custom-made automobile. At your request, your neighborhood mechanic agrees to build you such a car. In building the car, the mechanic gets competitive quotes on all the necessary parts and tooling, pays laborers only the minimum wage, and asks only a very small profit.

How do you think the final price will compare to a car off an assembly line? Probably at least ten times more expensive. Parts alone may be five times more expensive. The entire cost of tooling will be charged to one car. Labor, although cheaper, will likely not be as efficient as assembly-line labor. Is the price reasonable? That decision can only be made through price analysis.
I.3.3 Identify Cost Realism Analysis Considerations

Definition of Cost Realism Analysis. Cost realism analysis is the process of independently reviewing and evaluating specific elements of each offeror’s proposed cost estimate to determine whether the estimated proposed cost elements:

- Are realistic for the work to be performed;
- Reflect a clear understanding of the requirements; and
- Are consistent with the unique methods of performance and materials described in the offeror’s technical proposal.

When to Use Cost Realism Analysis. Perform a cost realism analysis of each cost-reimbursement contract offer to determine the probable cost of contract performance and use that estimate in your evaluation of the best value to the Government.

- The probable contract cost related to a cost-reimbursement contract offer may differ substantially from the proposed cost. Your most probable cost estimate should reflect your best estimate of the cost of any contract that is most likely to result from the offeror’s proposal.
- Determine the probable cost for each offer by adjusting the proposed cost, and fee when appropriate, to reflect any additions or reductions in cost elements to realistic levels based on the results of the cost realism analysis.

You may also use cost realism analysis in evaluating competitive offers for fixed-price incentive contracts or, in exceptional cases, on other competitive fixed-price contracts.

- Give special consideration to using cost realism analysis to evaluate offers for fixed-price contracts when:
  - New requirements may not be fully understood by competing offerors;
  - There are quality concerns, or
  - Past experience indicates that contractors’ proposed costs have resulted in quality or service shortfalls.

- When using cost realism analysis to evaluate offers for a fixed-price contract, you may use the results of your analysis in performance risk assessments and responsibility determinations. However, proposals must be evaluated using the criteria in the solicitation, and the offered prices must not be adjusted as a result of the analysis.

I.4 Identifying Potential Acquisition Team Members

The Acquisition Team includes everyone involved in the acquisition -- beginning with the customer and ending with the contractor providing the product or service. This text refers to Government participants in the acquisition process as the Government Acquisition Team.

The Government is committed to providing training, professional development, and other resources necessary for maintaining and improving the knowledge, skills, and abilities of all Government Acquisition Team participants. This commitment applies both to the individual’s particular area of expertise within the Government and the individual’s role as a Team member.

Potential Team Members For most contracts, the Government Acquisition Team will be relatively small. The following will typically play a key role in contract pricing:

- Contracting officer or contract specialist;
- Requirements manager (i.e., program or project manager);
- End user; and
- Commodity specialist.

You might also obtain assistance from one or more of the following:

- Inventory manager;
- Auditor;
- Technical specialist;
- Transportation, property, or logistics managers;
- Legal counsel;
- Competition advocate;
- Administrative contracting officer or administration specialist; or
This table summarizes the role that potential Government Acquisition Team members might play in making or supporting the contract pricing decision.

<table>
<thead>
<tr>
<th>Potential Members</th>
<th>Typical Role in Contract Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contracting Officer</td>
<td>The contracting officer is the person with authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the contracting officer operating within the limits of their authority as delegated by the contracting officer.</td>
</tr>
<tr>
<td>Contract Specialist</td>
<td>A contract specialist may be responsible for performing a wide variety of contracting activities under the authority of the contracting officer assigned to the contract. In this capacity, a contract specialist will likely provide key input to the pricing decision, but the ultimate decision on price reasonableness rests with the contracting officer.</td>
</tr>
<tr>
<td>Requirements Manager</td>
<td>Requirements managers initiate acquisitions by preparing purchase requests. Purchase requests specify the requirement and generally include an Independent Government Estimate. After you receive of the purchase request, requirements managers often can help:</td>
</tr>
<tr>
<td>End User</td>
<td>The end user may or may not be the requirements manager. If the requirements manager is not the end user, you may find it useful to consult the end user when building the solicitation and making price-related decisions. In addition, the end user may be more knowledgeable about the product and a better source for an Independent Government Estimate than the requirements manager.</td>
</tr>
<tr>
<td>Commodity Specialist</td>
<td>Some organizations have dedicated commodity specialists who, among other things, heavily research the markets for their respective commodities.</td>
</tr>
<tr>
<td>Inventory Manager</td>
<td>Inventory managers keep track of large stocks of products in Government warehouses and other such facilities. Among other things, inventory managers generate purchase requests for replacement supplies as users draw on the Government stocks. They tend to be especially concerned about the solicitation/contract, in terms of its potential impact on delivery, inventory levels, and inventory costs.</td>
</tr>
<tr>
<td>Auditor</td>
<td>Auditors are accountants with specialized training and experience in examining and analyzing cost or pricing data provided by offerors and contractor records (particularly accounting records). Their support can be invaluable in cost proposal analysis. In the Department of Defense, contract auditors are assigned to the Defense Contract Audit Agency (DCAA). In other agencies, auditors are typically assigned to the agency Inspector General.</td>
</tr>
<tr>
<td>Technical Specialist</td>
<td>These specialists generally write specifications or statements of work and technical evaluation factors and evaluate technical proposals. In many acquisitions, the requirements manager acts as the technical specialist. Larger acquisitions, however, may involve teams or panels of technical experts (who, depending on the specific deliverable, may be engineers, scientists, or other similar professionals). From a pricing standpoint, technical specialists may have a good understanding of the costs necessary to build a deliverable and also of the types and sources of commercial products that may be available to satisfy a requirement.</td>
</tr>
</tbody>
</table>
Transportation, Property, or Logistics Managers

These specialists can help you select and apply price-related factors that involve transportation costs, Government-furnished property, and ownership costs. All may be involved if you plan to solicit based on a full life-cycle cost model.

Legal Counsel

Lawyers may play a role in clearing contracts and reviewing justifications for such price-related decisions as cancellation of an IFB after opening. Look to them for advice on the solicitation and on making the price-related decisions.

Competition Advocate

Competition advocates review acquisition plans and analyze specifications to identify and, where possible, remove “barriers” to full and open competition. They also review justifications for other than full and open competition. From a pricing standpoint, they can be valuable allies in maximizing price competition.

Administrative Contracting Officers and Administration Specialist

Some Federal agencies have dedicated contract administration offices. These offices are often involved in preaward reviews of contract pricing proposals because contract administrators have more complete information on the production and pricing practices of specific offerors. Administrative contacting officers may also be responsible for pricing certain kinds of contract modifications.

Cost/Price Analyst

Some contracting activities have dedicated cost/price analysts who can assist in performing the tasks described in this book. However, such analysts are typically only available for higher dollar, more complex procurements.

1.0 Chapter Introduction

Presolicitation Market Research. In Government acquisition, market research requires collecting and analyzing information about capabilities within the market to satisfy Government needs. Market research policies and procedures should be designed to arrive at the most suitable approach to acquiring, distributing, and supporting supplies and services. The personnel involved must ensure that legitimate needs are identified and trade-offs evaluated to acquire items which meet those needs.

To get the supplies and services that will best meet the needs of the Government, the Government members of the Acquisition Team must understand the true needs of the Government and know what is available in the marketplace. Market research should be an ongoing process for every member of the Acquisition Team, but there are three points where effective market research is particularly important:

- The purchase request should reflect the results of market research conducted by the requester. The requester should consider input from other Government members of the Acquisition Team, especially from the user (if different than the requester) and Government technical personnel. Contracting personnel should support and encourage requester market research efforts whenever possible. For example, the catalogs and price lists available in the contracting office may be invaluable to the requester’s market research effort. Contracting personnel should not take the responsibility for developing the requirements documents and should remind other members of the Team not to disclose source selection information outside channels authorized by the agency head (see FAR 3.104-4).
- Before soliciting offers for acquisitions with an estimated value in excess of the simplified acquisition threshold, you must conduct market research to assure that together the requirements documents and the contract business terms form the most suitable approach to acquiring, distributing, and supporting supplies and services. This research may be a one-time analysis or part of your ongoing effort to know and understand the marketplace for the items that you routinely procure. As you perform your market research, you may question the requirements documents, but you must never change those documents without authorization from the requester.
- Before soliciting offers for acquisitions with an estimated value less than the simplified acquisition threshold, you should perform market research whenever adequate information is not available and the circumstances justify its cost.

Information for Market Research. When conducting market research, you should not request potential sources to submit more than the minimum information necessary. Most firms will gladly support Government market research as long as the result will benefit the firm. Most will provide complete information about how the products that they can provide will meet Government requirements. However, they are unlikely to provide information about problems with their products or about other products that
could better meet the Government's needs at a lower total cost. Generally, information on a particular product or industry is available from many sources other than potential offerors. These sources include:

- Knowledgeable individuals in Government and industry;
- The results of recent market research undertaken to meet similar or identical requirements;
- Government data bases that provide information relevant to agency acquisitions;
- Interactive, on-line communication among industry, acquisition personnel, and customers;
- Source lists of similar items obtained from other contracting activities or agencies, trade associations or other sources; or
- Catalogs and other generally available product literature published by manufacturers, distributors, and dealers or available on-line.

**Market Research Results** Use the results of market research to:

- Determine if there are sources capable of satisfying the agency's requirements;
- Determine if commercial items or, to the extent commercial items are not available, nondevelopmental items are available that:
  - Meet the agency's requirements;
  - Could be modified to meet the agency's requirements; or
  - Could meet the agency's requirements if those requirements were modified to a reasonable extent.
- Determine the extent to which commercial items or nondevelopmental items could be incorporated at the component level;
- Determine the practices of firms engaged in producing, distributing, and supporting commercial items, such as terms for warranties, buyer financing, maintenance, and packaging and marking; and
- Ensure maximum practicable use of recovered materials and promote energy conservation and efficiency.

**Market Research and Contract Pricing.** FAR Part 10 requires that you use the results of market research in developing Government requirements and determining how you will satisfy those requirements. This research is required because the decisions made in the presolicitation phase of the acquisition process will be key factors in defining what the Government receives and the price that the Government will pay. For example, contracting decisions that:

- Increase contractor performance costs will normally increase contract price.
- Lower contractor performance costs will normally reduce contract price.
- Limit competition will normally increase contract price.
- Facilitate competition will normally reduce contract price.
- Increase contractor risk will normally increase contract price.
- Limit contractor risk will normally decrease contract price.

The better you understand the marketplace the better you will be able to make decisions that will enable you to meet the needs of the Government at a reasonable price. This same understanding of the marketplace will enable you to develop a better estimate of a reasonable price for a contract that meets the needs of the Government. Your preliminary price estimate and the factors that affect contract price will be key inputs to the acquisition planning process. For example, the method of contracting and required contract terms and conditions both depend on your estimate of contract price. In addition, your preliminary estimate of contract price will become a key input to your final determination of contract price reasonableness.

**1.1 Reviewing The Purchase Request And Related Market Research**

When determining how much reliance you can place on the Independent Government Estimate in making contracting decisions, you must evaluate the depth and quality of the analysis involved in developing the estimate. As a minimum, you should consider the following five areas:

- 1.1.1 - How Was The Estimate Made?
1.1.2 - What Assumptions Were Made?

Every estimate involves assumptions. Knowing and understanding those assumptions can give you an insight into the estimator's understanding of reliable estimate development.

Analysis of Assumptions In many cases, user/technical/program personnel are not familiar with relevant
cost factors and market forces that affect contract pricing. As a result, assumptions and estimates may not be accurate.

If the rationale used to develop the estimate is not clear or does not seem reasonable, ask questions! **IN PRICING, THERE ARE NO DUMB QUESTIONS!** If you do not know, ask! By asking questions about the Independent Government Estimate and accompanying documentation, you can identify assumptions that are not consistent with market realities and work with the requester to improve the estimate before the contracting process begins.

**Estimate Example 1:** The requester used the last price paid for an item to estimate the price for the same item 10 years later.

- **Assumptions** The requester has assumed that the last price paid was reasonable, and that the market situation has not changed in 10 years.
- **Analysis** Over a few days or weeks, it may be reasonable to assume that the price has not changed if quantity, delivery, and other factors have not changed. But in this case the last purchase was made 10 years ago. Normally, it is not reasonable to assume that the price has not changed in 10 years. Once you identify the assumptions used in estimate development, you can evaluate them and adjust for any that do not appear consistent with market realities.

**Estimate Example 2:** The requester estimated the price of 100 warehouse trucks with 3 cubic foot capacity based on the price paid for 2 cubic foot units acquired during the last month.

- **Assumptions** The requester has assumed that the recent price was reasonable, and that the unit price is not affected by changes in unit capacity.
- **Analysis** The assumption that unit price will not be affected by the unit's capacity may or may not be reasonable. However, the great difference in capacity should lead you to subject this assumption to closer scrutiny during your market research.

### 1.1.3 What Information And Analysis Were Used?

It is important to determine what the requester knows about the item or service being requested and what type of analysis was used in estimate development.

**Market Research Information.** The most successful estimators know their item. Before they make an estimate, they collect information on the product and the market for that product. Their market research may be a one-time effort or part of an on-going process that is an integral part of their normal job. The most reliable estimates are prepared by estimators who have performed detailed market research and can answer "yes" to the following questions that apply to a particular purchase request:

- Did the estimator perform a detailed analysis of the Government requirements documents?
- Did the estimator identify performance, quality, and/or acceptance criteria differences exist between new "requirement" and the information analyzed?
- Is the estimator familiar with the market for the item, including:
  - Last price paid?
  - General market price changes?
  - Current commercial market price?
  - Quantity price breaks?
  - Possible substitutes?

**Estimating Analysis.** Market information alone is usually not enough. The estimator must be able to apply appropriate analysis to estimate development. Reasoned analysis provides a much more supportable estimate than one that is simply based on estimator judgment and experience. The strongest estimates are usually the result of a reasoned analysis supported by the use of appropriate quantitative techniques.

**Reasoned Analysis.** A reasoned analysis is an analysis that sets forth the known information and clearly explains how it was used in estimate development. This analysis may or may not be supported by the use of quantitative techniques.

**Quantitative Techniques.** When appropriate, adjustments should be made using accepted quantitative techniques. For example, index numbers can be used to quantify price changes and adjust historical pricing data.

**Estimate Support Comparison.** Estimates supported by words such as "professional judgment," but no factual data and explanations about how that professional judgment was applied, are typically of little
value. Estimates based on good information and the application of appropriate quantitative techniques or reasoned analysis will generally be more accurate and easier to support throughout the acquisition process. For example, in an analysis of changes in technology, which of the following techniques would be more useful in price estimation?

**Professional Judgment.** "Based on my 20 years of experience as a Project Engineer and my knowledge of the product, I estimate the price of this unit at $585,000."

**Reasoned Analysis.** "We are requesting new high sensitivity replacement units. A year ago, a product could not be produced with this level of sensitivity to high frequency sound. Today, units with similar sensitivity improvements are available at a 30 percent higher price than the less sensitive units they replaced. Therefore the estimated price for this unit, $585,000, is 30 percent higher than the $450,000 price last paid for the less sensitive unit that it will replace."

### 1.1.4 Where Was The Information Obtained?

The breadth and depth of the requester’s market information will have a substantial impact on the quality of the estimate. Learn what you can about the sources of information used by the requester in estimate development, because some sources of information are better than others. Knowing the sources of information will make it easier for you to evaluate the reliability of the estimate.

**Estimate Information Sources.** Many estimators rely exclusively on historical prices as their base for estimate development. Historical prices are an excellent source of information on the price at some point in the past but market conditions and Government requirements change over time. Past prices for a similar item may have been based on detailed Government specifications while the current requirement is based on products commonly traded in the commercial market place. In that situation, historical prices may not provide a viable price estimate.

Encourage requesters to provide source data with their estimates. Information, such as a vendor catalog or portion thereof, will provide an excellent starting point for your market research.

**Product Analysis.** If the requirement is unique and there is no price history available, the estimator must develop a price estimate by some other form of analysis. One option is for the requester to develop an estimate based on an evaluation of the material and labor required to produce the product, as well as the risks associated with design, development, production, delivery, and acceptance. When such estimates are required, the more current the data used to develop the cost estimate, the more reliance you can place on the estimate.

**Misleading Information.** Many data sources, such as stock lists, can present information that is difficult to use in price estimating. The price information is usually not current and there is typically little information about its source. Prices may be historical prices from an unknown point in the past or even averages of historical prices. It is typically difficult or impossible to adjust these prices for changes in the market situation. As a result, you must be particularly careful when using such data as a base for estimated development.

**Emphasize Estimator Independence.** While use of vendor catalogs and other methods of market research should be encouraged, estimators MUST BE DISCOURAGED FROM CONTACTING VENDORS FOR SPECIFIC QUOTATIONS. This is particularly true in sole source situations, where the Independent Government Estimate may be a primary basis for determining price reasonableness. If both the estimate and the proposal come from the offeror, there is no independent measure of price reasonableness. If the estimator must contact a vendor to better understand specifications, pricing, discounts, etc. then two very important steps must be taken:

- First discuss the need to contact the vendor with the responsible contracting officer
- Also, make it very clear, in writing, to the vendor that you are performing market research and need more information about the product or pricing, and that you ARE NOT REQUESTING A QUOTATION OF ANY KIND.

### 1.1.5 How Did Previous Estimates Compare With Prices Paid?

An examination of the Independent Government Estimate should include an examination of the estimator's track record. Just as past vendor performance is an indicator of future contract performance, the quality of past estimator performance is an indicator of the quality of the current estimate.

**Comparison with Prices Paid.** In evaluating estimates, ask: "Have the estimator's past estimates been close to contract prices determined fair and reasonable through analysis using other price analysis..."
techniques?"
If the answer is yes, greater reliance can be placed on current estimates developed using similar techniques.
If the answer is no, less reliance should be placed on these estimates.

1.2 - Considering Contract Pricing In Your Market Research
The Independent Government Estimate is only one preliminary estimate of contract price. As a minimum, your research, should consider the following data sources:

- 1.2.1 - Historical Pricing Data For Market Research
- 1.2.2 - Published Data For Market Research
- 1.2.3 - Market Research Data From Buyers And Other Experts
- 1.2.4 - Market Research Data From Prospective Offerors
- 1.2.5 - Market Research Data From Other Sources

Factors to Consider in Researching the Market. Each time you conduct market research the process will be different because of differences in Government requirements, market conditions, and other factors. The following table identifies research factors and outlines the type of questions that you should be able to answer when you complete your market research. Not all of the questions identified in the table will be valid for every acquisition. For some acquisitions, you will have many specialized questions that are not covered in the following table. However, the research factors identified and the related questions provide a good framework for your market research.

### Pricing Factors to Consider in Market Research

<table>
<thead>
<tr>
<th>Research Factor</th>
<th>You Should Be Able to Answer Questions Such As...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing History</td>
<td>● What information is available concerning past prices paid for the product and changes in the product or market since then?</td>
</tr>
<tr>
<td></td>
<td>● Have there been historic differences between prices paid by the Government vis-à-vis other buyers? Why?</td>
</tr>
<tr>
<td>Current Competitive Conditions</td>
<td>● How many sellers are in the market?</td>
</tr>
<tr>
<td></td>
<td>● How many buyers?</td>
</tr>
<tr>
<td>Current Overall Level of Demand</td>
<td>● What is the relationship of the quantity we intend to buy vis-à-vis the quantities that others buy?</td>
</tr>
<tr>
<td></td>
<td>● Will our volume justify a lower than market price due to the seller's increased economies of scale?</td>
</tr>
<tr>
<td></td>
<td>● Will our volume be so large as to drive the sellers to or beyond full capacity, resulting in unanticipated inflation?</td>
</tr>
<tr>
<td>Trends in Supply and Demand</td>
<td>● Will demand be higher or lower at the time of award than now?</td>
</tr>
<tr>
<td></td>
<td>● Will supply capacity keep pace with demand?</td>
</tr>
<tr>
<td>Pattern of Demand</td>
<td>● Is there a cyclical pattern to supply and demand?</td>
</tr>
<tr>
<td></td>
<td>● Would awarding six months from now result in lower prices than an immediate award?</td>
</tr>
<tr>
<td></td>
<td>● Or would it be better to stock up now at today's prices?</td>
</tr>
<tr>
<td>Other Market Forces Expected to Affect</td>
<td>● What forces might drive up prices in the near future?</td>
</tr>
<tr>
<td></td>
<td>● What forces might lead us to expect lower prices in the future?</td>
</tr>
<tr>
<td>Pricing Strategies</td>
<td>What are the pricing strategies of firms in the market?</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>What are the implications for expected prices?</td>
</tr>
<tr>
<td>Sources of Supplies or Services</td>
<td>Which firms in the market are the most likely to submit offers to a Government solicitation?</td>
</tr>
<tr>
<td></td>
<td>Which are the least likely and why?</td>
</tr>
<tr>
<td>Product Characteristics</td>
<td>What features distinguish one product from another?</td>
</tr>
<tr>
<td></td>
<td>Which commercial products match most closely with the Government requirements document (as it currently reads in the purchase request)?</td>
</tr>
<tr>
<td></td>
<td>What is the apparent tradeoff between features and price?</td>
</tr>
<tr>
<td>Delivery/Performance Terms</td>
<td>What are the current distribution channels?</td>
</tr>
<tr>
<td></td>
<td>What are current transportation costs (if available and applicable)?</td>
</tr>
<tr>
<td></td>
<td>What are the commercial lead-times?</td>
</tr>
<tr>
<td>Ownership Costs</td>
<td>What are the commercial warranty terms and conditions (if any)?</td>
</tr>
<tr>
<td></td>
<td>What are the historical repair costs for each product?</td>
</tr>
<tr>
<td></td>
<td>What are the historical maintenance costs for each product?</td>
</tr>
<tr>
<td>Contract Terms and Conditions</td>
<td>What terms and conditions are used in commercial transactions?</td>
</tr>
<tr>
<td></td>
<td>What terms and conditions have been used in other Government acquisitions?</td>
</tr>
<tr>
<td></td>
<td>What type of contract is generally used in commercial transactions? Government acquisitions?</td>
</tr>
<tr>
<td>Problems</td>
<td>What has been the historical default rate by firms performing similar contracts?</td>
</tr>
<tr>
<td></td>
<td>What performance problems have typically been encountered?</td>
</tr>
<tr>
<td></td>
<td>Have similar acquisitions been characterized by claims or cost overruns?</td>
</tr>
</tbody>
</table>

### 1.2.1 Historical Pricing Data For Market Research
Prior to contracting, FAR 7.103(l) requires the contracting officer to review:
- The acquisition history of the supplies and services; and
- A description of the supplies, including, when necessary for adequate description, a picture, drawing, diagram, or other graphic representation.

One of the reasons for this requirement is to ensure that prior prices are considered in estimating the proper price of the current acquisition. However, you must also remember that information from Government historical price data bases provides a picture of what happened in the past. You must integrate this information with information from other market research to enhance the accuracy of your price estimate.

**Sources of Acquisition Histories.** Acquisition histories can be found in many sources. Typically, the best sources are contract files, computerized acquisition data files, and manual item records.

**Contract Files.** Usually, the best source of information on past pricing decisions is the original file of the contract action. Detailed information, and the rationale used to determine price reasonableness should be available in the file.

**Computerized Acquisition Data Files.** Computers provide immediate access to the data considered
most important to purchase decision making. While computer data files may not be as complete as purchase files, they do provide key data in a form that can be used by the buyer in a timely fashion. **Manual Item Records.** Manual item records typically provide data similar to that contained in computerized acquisition data files.

**Researching Historical Acquisition Pricing Information.** Historical prices are an excellent source of market information. Research of historical market information can tell you a lot about the acquisition situation for the product at some point or points in the past. For that information to be useful, you must be able to determine what the market situation was in the past and how it has changed since then. The following table presents research elements that you should consider in your examination of historical acquisition information and questions that you should consider in your research.

### Historical Acquisition Data for Pricing

<table>
<thead>
<tr>
<th>Research Element</th>
<th>You Should Be Able to Answer Questions Such As...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trends in Supply and Demand</strong></td>
<td>• When did past acquisitions take place?</td>
</tr>
<tr>
<td></td>
<td>• Is there any indication of prevailing market conditions at that time?</td>
</tr>
<tr>
<td><strong>Pattern of Demand</strong></td>
<td>• What quantities were solicited for each acquisition?</td>
</tr>
<tr>
<td></td>
<td>• What quantities were acquired?</td>
</tr>
<tr>
<td><strong>Trends in Prices</strong></td>
<td>• What was the contract price?</td>
</tr>
<tr>
<td></td>
<td>• How did the unsuccessful offers compare with the successful offer?</td>
</tr>
<tr>
<td><strong>Start-up Costs and Pricing Strategy</strong></td>
<td>• Did the contract price include one-time engineering, tooling, or other start-up costs?</td>
</tr>
<tr>
<td></td>
<td>• Should future contracts include similar or related costs?</td>
</tr>
<tr>
<td></td>
<td>• Were necessary start-up costs paid for in a manner separate from the price for the item or service?</td>
</tr>
<tr>
<td><strong>Sources of Supplies or Services</strong></td>
<td>• How many sources were solicited for the prior acquisition?</td>
</tr>
<tr>
<td></td>
<td>• What specific sources were solicited?</td>
</tr>
<tr>
<td></td>
<td>• How many sources offered bids or proposals?</td>
</tr>
<tr>
<td></td>
<td>• What specific sources offered bids or proposals?</td>
</tr>
<tr>
<td><strong>Product Characteristics</strong></td>
<td>• Are there any significant differences between the Government requirements documents for the prior contract and the current requirements?</td>
</tr>
<tr>
<td><strong>Delivery/Performance Terms</strong></td>
<td>• What was the delivery or performance period in days, weeks, months, or years?</td>
</tr>
<tr>
<td></td>
<td>• In what month(s) were the supplies to be delivered or the service to be performed?</td>
</tr>
<tr>
<td></td>
<td>• Did the vendor meet the delivery targets?</td>
</tr>
<tr>
<td></td>
<td>• What was the FOB point?</td>
</tr>
<tr>
<td></td>
<td>• Was premium transportation required for timely delivery?</td>
</tr>
<tr>
<td><strong>Ownership Costs</strong></td>
<td>• What costs of ownership were associated with the acquisition?</td>
</tr>
<tr>
<td><strong>Acquisition Method</strong></td>
<td>• What acquisition method was employed for past acquisitions?</td>
</tr>
</tbody>
</table>
Contract Terms and Conditions

- What were the general terms of past contracts?
- Are there any significant differences between terms of the last contract (e.g., packing requirements, type of contract, and the like) and those recommended for this acquisition?

Problems

- What problems (if any) were encountered during contract performance?

1.2.2 Published Data For Market Research

This subsection presents examples of several types of published information that you can use in developing your preliminary estimates of contract price.

- 1.2.2.1 - Manufacturer And Dealer Catalogs
- 1.2.2.2 - Product Brochures And Promotional Material
- 1.2.2.3 - Trade Journals
- 1.2.2.4 - Government Or Independent Testing
- 1.2.2.5 - Source Identification Publications
- 1.2.2.6 - Federal Supply Schedules (FSS)
- 1.2.2.7 - Government Economic Data
- 1.2.2.8 - Non-Government Economic Data

Typical Data Available by Source. The table below summarizes the sources of pricing related data and typical data available for each source.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalogs</td>
<td>Yes</td>
<td>Often</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Rarely</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Product Brochures</td>
<td>Yes</td>
<td>Often</td>
<td>Often</td>
<td>Often</td>
<td>Often</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Trade Journals</td>
<td>Yes</td>
<td>Yes</td>
<td>Often Rarelly</td>
<td>Rarelly</td>
<td>Rarelly</td>
<td>Often Rarelly</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Advertisement Product Evals</td>
<td>Yes</td>
<td>Yes</td>
<td>Rarely</td>
<td>Often Rarelly</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Source ID Pubs</td>
<td>No</td>
<td>Rarelly</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Yellow Pages</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Thomas Register</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Gov't or Independent Testing</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalogs</td>
<td>Yes</td>
<td>Often</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Rarely</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Product Brochures</td>
<td>Yes</td>
<td>Often</td>
<td>Often</td>
<td>Often</td>
<td>Often</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Trade Journals</td>
<td>Yes</td>
<td>Yes</td>
<td>Often Rarelly</td>
<td>Rarelly</td>
<td>Rarelly</td>
<td>Often Rarelly</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Advertisement Product Evals</td>
<td>Yes</td>
<td>Yes</td>
<td>Rarely</td>
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<td>Yes</td>
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</tr>
<tr>
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<td>Rarelly</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Yellow Pages</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Thomas Register</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Gov't or Independent Testing</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
1.2.2.1 Manufacturer And Dealer Catalogs
Catalogs are familiar sources of data that can be found in both department stores and mail order houses. The manufacturer and dealer catalogs used in Government purchasing resemble these catalogs in the type of information they provide. [These catalogs can often be found on the company’s website.]
Typical data you can find in manufacturer and dealer catalogs include:

- Product descriptions
- Pictures
- Prices and quantity discounts
- Minimum order requirements
- Delivery data
- Points of contact for quotes and orders

1.2.2.2 Product Brochures And Promotional Material
Brochures and promotional material provide much greater detail about specific products than would normally be included in a catalog with several thousand other products. [This type of material may also be available on the company’s website.] While details on pricing and delivery are often included, this information may be excluded in order to provide greater latitude in negotiating the terms of sale.
The following are typical data you can find in product brochures and promotional material:

- Detailed specifications
- Pictures
- Available service guarantees and products
- Points of contact for quotes and orders
- Pricing information
- Delivery data

1.2.2.3 Trade Journals
Trade journals provide a variety of information from different sources, including advertisements, product evaluations, and independent articles. 
Trade Journal Data Sources. 
Advertisements typically consist of product descriptions, often with pictures and comparisons with competitor’s products. Sources to consult for additional information may also be identified.
Product evaluations provide independent information to members of the trade who may be considering the purchase of that product or a similar one. Evaluations usually deal with technical capabilities, but
often include information on source locations, pricing, and warranties. Articles about the trade may indirectly provide an independent analysis of product capabilities. Successes or failures in using particular products or services serve as evaluations of their quality.

The table below gives an overview of typical data you can find in trade Journals.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Typical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertisements for Products Used in the Trade</td>
<td>● General product descriptions</td>
</tr>
<tr>
<td></td>
<td>● Pictures</td>
</tr>
<tr>
<td></td>
<td>● Comparisons with competitive products</td>
</tr>
<tr>
<td></td>
<td>● List prices</td>
</tr>
<tr>
<td>Independent Product Evaluations</td>
<td>● Strengths and weaknesses of products</td>
</tr>
<tr>
<td></td>
<td>● Warranty or guarantee provisions</td>
</tr>
<tr>
<td></td>
<td>● Comparisons with competitive products</td>
</tr>
<tr>
<td></td>
<td>● Pricing information</td>
</tr>
<tr>
<td>Articles</td>
<td>● Application of existing products to problem solving</td>
</tr>
<tr>
<td></td>
<td>● Strengths and weaknesses of products in problem solving</td>
</tr>
</tbody>
</table>

1.2.2.4 - Government Or Independent Testing

Product testing by Government or independent laboratories can provide essential product data. The data can be used to determine if a product meets minimum requirements and to identify and compare similar products. Qualified Products Lists (FAR 9.201 and 9.202(c)). Successful testing of a product, by the Government may result in inclusion of that product on a Qualified Products List (QPL). A QPL is a listing of products which have been examined, tested, and have satisfied all applicable Government product qualification requirements. When a QPL applies to a particular product, all potential offerors must either be on the list or demonstrate to the satisfaction of the contracting officer that their product meets or can meet QPL standards before the date set for contract award. You can also use QPLs to identify potential sources for similar products. Underwriters Laboratory. The best known independent testing laboratory is Underwriters Laboratory (UL). Testing and approval by UL is essential for a wide variety of electrical products.

The table below gives an overview of typical data you can obtain from product standards and testing laboratories.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Typical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualified Products Lists</td>
<td>Results of product tests to Government requirements</td>
</tr>
<tr>
<td>Underwriters Laboratory (UL)</td>
<td>Results of tests of electrical products to UL commercial standards</td>
</tr>
</tbody>
</table>

1.2.2.5 Source Identification Publications

There are thousands of publications designed to assist you in locating possible sources of product information. The most widely accepted of these are the Yellow Pages and the Thomas Register of American Manufacturers.

Yellow Pages. Every city, large or small, has a telephone book with an associated Yellow Pages. Larger cities and metropolitan areas typically have one or more Commercial Yellow Pages and Business Yellow Pages. Many firms advertise in both types, but the business Yellow Pages specialize in the business and industrial products that are more relevant to Government acquisition. Both Commercial and Business Yellow Pages identify firms by the products or services that they provide. Listings may even include pictures of major products.
The Thomas Register of American Manufacturers. The Thomas Register of American Manufacturers, commonly referred to as the Thomas Register, devotes 23 volumes to assisting commercial buyers identify potential product sources. The volumes are divided into four sections:

- Products and Services -- companies listed by product or service.
- Company Profiles -- capabilities and contact information are presented for listed firms.
- Catalog Files -- detailed product information, specifications, drawings, photos, availability, and performance data.
- Inbound Traffic Guide -- intermodal guide to transportation sources.

The table below gives an overview of typical data you can find in the Yellow Pages and the Thomas Register.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Typical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow Pages</td>
<td>Sources of identified products and services by geographic</td>
</tr>
<tr>
<td></td>
<td>location</td>
</tr>
<tr>
<td></td>
<td>Specific products within a product service category</td>
</tr>
<tr>
<td>Thomas Register</td>
<td>Sources of identified products and services</td>
</tr>
<tr>
<td></td>
<td>Source capabilities and contact information</td>
</tr>
<tr>
<td></td>
<td>Product specifications</td>
</tr>
<tr>
<td></td>
<td>Selected product pictures</td>
</tr>
<tr>
<td></td>
<td>Product availability</td>
</tr>
<tr>
<td></td>
<td>Product performance</td>
</tr>
<tr>
<td></td>
<td>Transportation sources</td>
</tr>
</tbody>
</table>

1.2.2.6 Federal Supply Schedules (FAR 8.401 and FAR 8.404(a))

The General Services Administration (GSA) is best known for its stock program which buys, stores, and distributes a wide variety of items for use by all Government agencies. However, GSA also directs and manages the Federal Supply Schedule program that provides Federal agencies with a simplified process for obtaining commonly used supplies and services at prices associated with volume buying. GSA establishes indefinite delivery contracts with commercial firms to provide supplies and services at stated prices for given periods of time. The Federal Supply Schedule (FSS) program then issues Federal Supply Schedules (FSSs) that contain the information for placing delivery orders with contractors. Contracting offices can then issue delivery orders directly to the FSS contractors for the required supply or service. The FSS provides you with sources for a wide variety of supplies and services. It is important to understand the basics for using the FSSs. Oversight organizations have found in the past that contracting officers sometimes simply compare a proposed price for a sole source item to prices posted on the FSS for similar items to determine price reasonableness. This is not sufficient, especially for larger purchases, nor does it meet the requirements for obtaining competition. Let's look at the FSS process, including specific DoD requirements.

Use of the FSSs is considered a "competitive procedure" when the procedures established by the GSA Administrator are followed. Under the existing FAR, the FSSs prices have been determined to be fair and reasonable and a separate determination of fair and reasonableness is not required except for orders of services that require a statement of work (SOW). For orders of services that require a SOW, the ordering activity is responsible for considering the level of effort and the mix of labor proposed to perform a specific task being ordered, and for determining that the total price is reasonable.

Effective March 13, 2014, a deviation to the FAR was issued requiring ordering contracting officers using Federal Supply Schedules on behalf of the Department of Defense to evaluate prices using the proposal analysis techniques at FAR 15.404-1 in lieu of FAR 8.404 (d), Pricing. The deviation states:

Supplies offered on the schedule are listed at fixed prices. Services offered on the schedule are priced either at hourly rates, or at a fixed price for performance of a specific task (e.g., installation,
maintenance, and repair). GSA has determined the prices of supplies and fixed-price services, and rates for services offered at hourly rates, to be fair and reasonable for the purpose of establishing the schedule contract (emphasis added). GSA's determination does not relieve the ordering activity contracting officer from the responsibility of making a determination of fair and reasonable pricing for individual orders, BPAs, and orders under BPAs, using the proposal analysis techniques at 15.404-1. The complexity and circumstances of each acquisition should determine the level of detail of the analysis required.

This deviation remains in effect until incorporated into the DFARS or rescinded. A copy of the Director, Defense Procurement policy memo may be found at http://www.acq.osd.mil/dpap/policy/policyvault/USA001004-14-DPAP.pdf.

GSA has established a maximum order threshold on a Special Item Number (SIN)-by-SIN basis for each schedule contract. For all FSSs orders that exceed the maximum order threshold, ordering activities must seek additional price reductions from the schedule prices. The FAR also permits ordering activities to seek additional price reductions for orders that do not exceed the maximum order thresholds. Additional FSS ordering procedures are discussed below.

(1) For orders of supplies, and services that do not require a SOW, ordering activities are required to survey at least three schedule contractors or review the catalogs or pricelists of at least three schedule contracts before placing an order that exceeds the micro-purchase threshold. If the order exceeds the maximum order threshold, ordering activities are also required to-

(a) Review the pricelists of additional schedule contractors;
(b) Seek price reductions from the schedule contractor(s) considered to offer best value; and
(c) Place an order with the schedule contractor that provides best value.

(2) For orders of services that require a SOW over the micro-purchase threshold, ordering activities-

(a) Must develop a SOW that includes the work to be performed, location of work, period of performance, deliverable schedule, applicable performance standards, and any special requirements.
(b) Must provide the RFQ (including the SOW and evaluation criteria) to at least three schedule contractors that offer services that will meet the agency's needs.
(c) Should request that contractors submit firm-fixed prices to perform the services identified in the statement of work.

(3) For orders of services that require a SOW over the maximum order threshold, the ordering activity is required to-

(a) Provide the RFQ (including the SOW and evaluation criteria) to additional schedule contractors that offer services that will meet the needs of the ordering activity. To determine the appropriate number of additional schedule contractors to provide the RFQ to, ordering activity are advised to consider the complexity, scope and estimated value of the requirement and the market search results.
(b) Seek price reductions.
(c) Further, ordering activities are required to provide the RFQ (including the SOW and evaluation criteria) to any schedule contractor who requests a copy of it and evaluate all responses received.

Additional DoD FSS Ordering Procedures (DFARS 208.405-70). DoD policy requires each order exceeding $100,000 to be made on a competitive basis. An order is placed on a competitive basis only if the contracting officer provides fair notice of the intent to make the purchase, including a description of the supplies to be delivered or the services to be performed and the basis upon which the contracting officer will make the selection, to-

(1) As many schedule contractors as practicable to reasonably ensure that offers will be received from at least three schedule contractors that can fulfill the requirements, and the contracting officer receives offers from at least three contractors that can fulfill the requirements; or
(2) All contractors offering the required supplies or services under the schedule.

(3) All offers received must be fairly considered. These requirements apply to orders placed by DoD and non-DoD agencies placing orders on the behalf of DoD. In December 2006, the SARA panel cited the DoD competition policy as a "best practice" and recommended that the policy be adopted government-wide.

Other Related Matters. On December 6, 2006, DoD and GSA established a Memorandum of Agreement (MOA) to identify the roles and responsibilities of DoD and GSA for the FSSs. As a part of the MOA, an action plan was established, in part, to improve the pricing of DoD orders on the FSSs. Specifically, the plan includes actions to ensure-

(1) Price reasonableness determinations are completed on every contract or order placed by or on the
behalf of DoD.
(2) Pricing on GSA contract vehicles and the services it provides represents the best value on a contract/order basis.
(3) Adequate price competition is obtained for contracts or orders either issued by or on the behalf of DoD in accordance with statutory and regulatory requirements.
(4) In addition, the plan requires GSA to perform comprehensive reviews of targeted GSA schedules to ensure competitive market pricing has been established and to conduct a follow-on review of compliance with DoD competition requirements including Section 803 of the 2002 National Defense Authorization Act.

GSA Advantage
GSA Advantage is an electronic on-line shopping mall maintained by the General Services Administration to support Government operations. With GSA Advantage, you can instantly obtain a wide variety of product information that you can use in pricing the same or similar products. Research capabilities include:
Browsing or searching for items using key words, part numbers, National Stock Numbers, or vendor names;
Comparing features, prices, and delivery options; and
Configuring products and adding accessories.
The following gives an overview of typical data available in FSS including FSS available published from GSA Advantage:
Product descriptions
Pictures
Pricing and discount information
Delivery/Performance terms

1.2.2.7 - Government Economic Data
The Federal Government develops and publishes large amounts of economic data. Much of this information is used to make national economic decisions. It is valuable to buyers attempting to develop preliminary price estimates, because knowledge of the economy and market forces is vital.

Data are published by several Government departments and bureaus. The best known sources include:
- Department of Agriculture
- Department of Commerce
- Bureau of Labor Statistics (BLS)
- Federal Reserve System
- Congress

Index Numbers. Specific price comparisons, known as price index numbers, are particularly useful in making price comparisons over time. You can use price index numbers to adjust the price for any purchase or sale of a particular product at any time, to estimate the contract price for your current requirement. You can even make comparisons using information from several acquisitions involving several different vendors.

You can use indexes routinely published by the Government or you can tailor indexes to fit your particular needs. The organizations that prepare Government indexes may even be willing to construct a special price index to meet your estimating needs, if the need for the index justifies their cost of developing it.

Probably the best known Government index is the Consumer Price Index (CPI), an index published by the Bureau of Labor Statistics. You may be able to use the CPI to evaluate price changes related to labor and labor intensive products. However, the index most commonly used by Government buyers is the Producer Price Indexes (PPI), another index published monthly by the Bureau of Labor Statistics. You can use the PPI to monitor and estimate price changes for products traded at the wholesale level.

The table below gives an overview of indexes and other data available from various Government departments and bureaus.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Typical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Agriculture</td>
<td>Agricultural Price Monthly -- Monthly agricultural price information by commodity</td>
</tr>
<tr>
<td></td>
<td>Agricultural Statistics -- Annual agricultural commodity information including price data</td>
</tr>
</tbody>
</table>
1.2.2.8 Non-Government Economic Data

There are a number of non-Government sources of economic and market data, including:

- Purchasing organizations;
- Commodity or industry publications; and
- Economic analysis services.

**Purchasing Organizations.** The most noted purchasing organization that publishes market data is the Institute for Supply Management (ISM). The ISM provides members with monthly information on market price trends and product availability. Data are based on the actual experience and projections of purchasing managers throughout the country.

**Commodity or Industry Publications.** Numerous commodity and industry publications provide specific market data. Periods of publication and the information presented vary.

**Economic Analysis Services.** Commercial economic analysis services have also been established to provide estimators with current analyses of general market conditions and price trends. Currently, the economic analysis service most widely accepted by Government purchasing organizations is Global Insights, Inc. A number of Government agencies contract with Global Insight which gives them access to Global Insight's economic analysis and forecasts. Global Insight, and similar companies provide a variety of services. As the timeliness and amount of information increases, the price also increases.

**Data from Non-Government Economic Sources.** The table below gives an overview of typical economic and market data that you can obtain from various non-Government sources.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Typical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchasing Organizations</strong></td>
<td>Manufacturing <a href="#">NAPM Report on Business</a> -- Monthly information on business activity, new orders, backlog of orders, supplier deliveries, and prices</td>
</tr>
<tr>
<td><strong>Commodity or Industry Publications</strong></td>
<td><a href="#">American Metal Market</a> -- Daily information on the metals industry from scrap to precious metals including prices</td>
</tr>
<tr>
<td></td>
<td><a href="#">Black’s Guide</a> -- Periodic information on commercial and industrial real estate leasing in key U.S. metropolitan areas</td>
</tr>
<tr>
<td></td>
<td><a href="#">Chemical Marketing Reporter</a> -- Weekly information on market indexes, current prices, and price changes</td>
</tr>
<tr>
<td></td>
<td><a href="#">Platt’s Oilgram Price Report</a> -- Daily information on current oil prices</td>
</tr>
<tr>
<td></td>
<td><a href="#">Pulp and Paper Week</a> -- Weekly information on paper industry prices, economics, and technology</td>
</tr>
<tr>
<td></td>
<td><a href="#">Random Lengths</a> -- Weekly information on prices of wood products</td>
</tr>
<tr>
<td><strong>Economic Forecasting</strong></td>
<td><a href="#">Standard &amp; Poor’s DRI Cost Information Service</a> -- Information and forecasts for more than 650 prices and wages in North America, Europe,</td>
</tr>
</tbody>
</table>
Services and the Pacific Rim

Buyers and other experts are important sources of market information. This is especially true when they have been involved in the acquisition of the same or similar items. They can refer you to official contract files that you may not otherwise find and they can provide tips and insights that may not appear in official files.

Data from Government Personnel

Examples of Government personnel who can provide information useful in pricing include:

- Buyers;
- Contract administrators;
- Technical experts, and
- Auditors

The table below gives an overview of typical data you can obtain from Federal Government buyers and analysts.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Typical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyers</td>
<td>● Information on purchases of the same or similar products</td>
</tr>
<tr>
<td></td>
<td>● Identification of potential sources</td>
</tr>
<tr>
<td></td>
<td>● Information on the capabilities of sources already identified</td>
</tr>
<tr>
<td>Contract Administrators</td>
<td>● Information on purchases of the same or similar products</td>
</tr>
<tr>
<td></td>
<td>● Information on the capabilities of sources already identified</td>
</tr>
<tr>
<td></td>
<td>● Contractor performance assessment review data</td>
</tr>
<tr>
<td>Technical Experts</td>
<td>● Identification of potential sources</td>
</tr>
<tr>
<td></td>
<td>● Information on the capabilities and efficiency of sources already identified</td>
</tr>
<tr>
<td></td>
<td>● Identification of price drivers in the Government requirements</td>
</tr>
<tr>
<td>Auditors</td>
<td>● Information from prior audits, including rate and other cost trends</td>
</tr>
<tr>
<td></td>
<td>● Information from contractor compensation reviews</td>
</tr>
</tbody>
</table>

Data from Personnel Outside the Government. Buyers and other experts from industry, state and local governments can also provide useful information, particularly for common supplies and services. The information that you can gather will depend on the personnel involved. For example, a buyer from outside the Federal Government can provide the same type of information that you would expect to receive from a Government buyer. However, the amount and types of data that you can gather depends largely on the willingness of the source to release what is often considered proprietary data.

Collecting Information. Information can be gathered in several ways. The two most common methods are interaction at professional meetings and specific questions or surveys.

- **Professional Meetings and Presentations.** Discussions at professional meetings and presentations are a good way to gather general information on purchasing particular categories of supplies and services. Professional organizations such as the National Contract Management Association and the National Association of Purchasing Managers actively encourage such professional development.
- **Telephone Surveys.** Telephone surveys can also provide useful information on potential sources in the area. Both government and non-government experts are usually anxious to respond to questions from fellow professionals. However, be aware that proprietary data restrictions may prevent many responses.

1.2.4 Market Research Data From Prospective Offerors

*Encourage Early Exchanges* ([FAR 15.201(a)](https://www.acs.org.uk/FAR/Federal-Acquisition-Rules-15.201-a)) Potential offerors are a good source of information of market information for planning purposes. Early exchanges of information between potential offerors and
members of the Government Acquisition Team can identify and resolve concerns regarding the acquisition strategy, the Government requirement, proposal instructions, offer evaluation criteria, reference documents, and other industry concerns.  

Techniques to Promote Early Exchanges  When draft Request for Proposals are released, they should be complete as possible, including factors for evaluation and price. Without this level of detail, offerors do not have sufficient insight into the Government's plans for the solicitation to be able to provide meaningful feedback. Techniques to promote early exchanges of information include:

- **Industry or Small Business Conferences.** Many industries sponsor periodic conferences to share information on technical achievements and business practices.
- **Public Hearings.** Government personnel can use public hearings to disseminate information about projected Government requirements. Prospective offerors and other interested parties can ask questions and provide input to the acquisition decision makers.
- **One-On-One Meetings.** Any meetings with prospective offerors that are substantially involved with potential contract terms and conditions should include the contracting officer.
- **Presolicitation Notices.** The notice may be used as a preliminary step in preparation for a negotiated acquisition. Issue the notice to potential sources and synopsizze the notice in accordance with FAR 5.2.
- **Draft Requests for Proposals.** Distributing a draft of the proposed solicitation in as complete a form as possible will provide prospective offerors an opportunity to comment on specific requirements that may unreasonably restrict competition or favor one firm over other firms in the industry.
- **Requests for Information.** A request for information (RFI) may be used when the Government does not presently intend to award a contract, but wants to obtain price, delivery, or other information for planning purposes. Responses to an RFI are not offers and cannot be accepted by the Government to form a binding contract. Agency approval may be required before issuing an RFI.
- **Presolicitation or Preproposal Conferences.** When you use a preproposal or presolicitation conference, materials distributed at the conference should be made available to all potential offerors, upon request.
- **Site Visits.** Visits to contractor plants or proposed sites of Government contract performance can facilitate information exchange.

Public Disclosure of Information. When specific information about a proposed acquisition that would be necessary for proposal preparation is disclosed to one or more potential offerors, that information must be made available to the public as soon as practicable, but no later than the next general release of information, in order to avoid creating an unfair competitive advantage. Information provided to a potential offeror in response to that offeror's request must not be disclosed if doing so would reveal the potential offeror's confidential business strategy.

The table below gives an overview of typical data available from these various mechanisms for exchanging information with prospective offerors.

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Typical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry or Small Business Conferences</td>
<td>General information about industry capabilities and business practices</td>
</tr>
<tr>
<td>Public Hearings</td>
<td>Industry feedback on projected Government requirements</td>
</tr>
<tr>
<td>One-On-One Meetings</td>
<td>Individual company feedback on ways and means to meet Government requirements</td>
</tr>
<tr>
<td>Presolicitation Notices</td>
<td>Expressions of potential offeror interest in the contemplated acquisition</td>
</tr>
<tr>
<td></td>
<td>Information on potential offeror's management, engineering, and production capabilities</td>
</tr>
</tbody>
</table>
1.2.5 Market Research Data From Other Sources
Other important sources of market data include trade and professional associations, state and local watchdog agencies, and interactive on-line communication groups. 

Trade and Professional Associations. Trade and professional associations can provide information about sources, source responsibility, commercial standards, and cost drivers.

Chamber of Commerce and Better Business Bureau. Professional organizations devoted to business development and the maintenance of responsible business practices, such as the Chamber of Commerce and Better Business Bureau, can provide substantial information on pricing, available competition, and the responsibility of identified sources.

State and Local Watchdog Agencies. State and local watchdog agencies can provide information on the capabilities and pricing of sources, particularly sources accused of price gouging or poor performance.

1.3 - Using Market Research To Estimate Probable Price
This section covers the following topics:

- 1.3.1 Evaluating Your Market Research
- 1.3.2 Developing Your Price Estimate

Use Market Research to Estimate Probable Price. As you perform your market research, document the sources of information that you considered and what you found. Consider how you can increase competition that includes firms that commonly sell the same or similar items in the commercial market. At the same time, consider how current requirements, particularly Government-unique requirements will affect competition and contract price. Generally, both tasks will focus on the same requirements, because requirements that unnecessarily limit competition will also unnecessarily increase contract price.

1.3.1 Evaluating Your Market Research
Questions to Consider in Evaluating Your Research. The better your research, the more reliance you should be able to place on the price estimate that you develop from that research. The list below contains
questions that you can use to evaluate the quality of your market research. Note that there may be some acquisitions where a particular question does not apply. For example, the first question deals with the use of historical price. If the Government has never acquired the product or a similar product, this question would not apply in your evaluation of estimate quality.

Factors to Consider in Developing an Estimated Price

In preparing your price estimate, have you considered:

- Historical prices paid for the product and changes in the product or market since then?
- The current level of competition between prospective offerors and how it will affect contract price?
- How increasing or decreasing the quantity being acquired would likely affect contract price?
- How changing the timing of the acquisition would likely affect contract price because of projected trends in supply or demand?
- How changing the timing of the acquisition would likely affect contract price because of projected cyclical changes in supply or demand?
- How other forces are expected to affect prices in the near future?
- How the pricing strategies of prospective offerors will affect contract price?
- Which firms in the market are expected to respond to the solicitation and how their prices compare with the firms that are not expected to respond?
- Whether the requirements document will unnecessarily increase prices proposed by offerors?
- Whether delivery/performance requirements will unnecessarily increase prices proposed by offerors?
- Whether different products from different vendors will have different costs of ownership?
- Whether contract terms and conditions will unnecessarily increase prices proposed by offerors?
- Ways to improve the risk related to problems associated with performance of similar contracts?

Evaluating Your Research. If you can answer “Yes” to all the questions in the list above, you have done an excellent job of market research for estimate development. When you must answer “No,” your research is incomplete. For smaller dollar acquisitions, an incomplete evaluation may be acceptable as long as the evaluation covers the factors that you feel are most likely to affect contract price. However, as the estimated price increases, the need for in-depth research also increases.

1.3.2 Developing Your Price Estimate

Different Data, Different Estimates. As you perform your market research, you will likely find different data that could lead you to different preliminary estimates of contract price. Using the price that you paid for the item 11 months ago, your estimate might be $19,700. If you use the last price paid for the item plus 4 percent inflation your estimate might be $20,488. The catalog price for a similar item from a commercial vendor might be $19,750. The catalog price for a comparable item from a second vendor might be $19,900.

Consider Various Estimates. Which estimate is correct? There is no one answer. They all appear to be valid estimates based on the information used to develop them. This demonstrates a common situation -- there is no single estimate that you can say is right to the exclusion of all other estimates. In fact, they define a range of reasonable prices from $19,700 to $20,488.

You could document the various estimates in a paragraph or in a table similar to the following:

<table>
<thead>
<tr>
<th>Preliminary Estimate of Contract Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Estimate</td>
</tr>
<tr>
<td>$19,700</td>
</tr>
<tr>
<td>$20,488</td>
</tr>
</tbody>
</table>
under contract XX-9X-XXXX plus 4 percent inflation estimated using the Producers Price Index for similar items.

$19,750 Estimate based on current FloMo Systems catalog price for the quantity required.

$19,900 Estimate based on current Acme Products catalog price for the quantity required.

Point Estimate. Given this same information, different estimators could have different opinions as to which of these estimates you should use as your preliminary price estimate. That is one reason why it is so important to present the range of possible estimates and the rationale for each. However, in this case an estimate of $19,750 appears most reasonable because it is based on a current catalog price. Remember, the lower $19,700 estimate is 11 months old.

Contract Type and Risk. Estimators must consider the impact of contract type and resulting performance risk to contractors when estimating future costs and price, whether estimates are based on historical or market data or whether estimates are based on the judgment of qualified estimators. For example, sound estimating practices would include probable impacts of performance risk in estimates prepared under a fixed price contract. Performance risk at the pre-proposal and proposal preparation stage of the acquisition cycle is analogous to estimating uncertainty. In this context, risk associated with future performance must be evaluated by estimators in terms of the potential for variability of performance under a resulting fixed price contract arrangement and include, as appropriate, estimated costs associated with mitigating risk and the impact of the probable occurrence of risk. Prudent estimators will perform a risk assessment in conjunction with development of estimates to evaluate those presently known and existing conditions and their foreseeable effects on future performance such that, and within reasonable limits of estimating accuracy, estimates of future costs reflect the best estimate of performance cost and resulting price to the government. (FAR 16.103(a), FAR 31.205-7)

- 2.0 - Chapter Introduction
- 2.1 - Improving the Schedule
  - 2.1.1 - Consolidate the Requirements
  - 2.1.2 - Describe Government Needs to Promote Competition
  - 2.1.3 - Consider Acquiring Other Than New Material
  - 2.1.4 - Consider Delivery Or Performance Schedules
  - 2.1.5 - Consider Liquidated Damages
- 2.2 - Improving Business Terms and Conditions
  - 2.2.1 - Base The Contract Type On Risk Analysis
  - 2.2.2 - Review Applicability Of Socioeconomic Requirements
  - 2.2.3 - Match Payment And Finance Terms to Market Conditions
  - 2.2.4 - Furnish Government Property
  - 2.2.5 - Optimize Price/Technical Trade-Offs
- 2.3 - Publicizing The Acquisition

2.0 - Chapter Introduction

Acquisition strategy. In this chapter, we will examine the effect of numerous acquisition decisions on competition and contract pricing. The sections of this chapter, provide answers to the following three questions:

- How can solicitation Schedules (e.g., Part I of the Unified Contract Format or UCF) be improved to yield more effective price competition?
- How can business terms and conditions (e.g., Parts II - IV of the UCF) be improved to yield more effective price competition?
- How can the methods of publicizing the buy be tailored to yield more effective price competition?

Why promote competition? The Government policy regarding competition is stated in FAR 6.101(b): Contracting officers shall provide for full and open competition through the use of competitive
procedure(s) . . . that are best suited to the circumstances of the contract action and consistent with the need to fulfill the Government's requirements efficiently.

Competition is important to contract pricing in three ways:

- Competition is widely acknowledged as the best way to encourage firms to offer a quality product at a reasonable price.
- Competitive prices are one of the best bases to use in evaluating the reasonableness of an offered price.
- Adequate price competition is the most common basis for excepting offerors from the Truth in Negotiations (TINA) requirement to submit cost or pricing data.

What does "Maximizing Price Competition" mean? To maximize price competition, you must:

- Attract competitive offers from the best vendors (in terms of their track records for pricing, quality, timeliness, and integrity), and
- Obtain reasonably-priced offers, in part because the solicitation:
  - Reflects the Government's actual minimum need and
  - Prospective contract provisions balance the cost risk associated with satisfying that need.

Key acquisition team members. Efforts to maximize competition require a detailed analysis of Government requirements. To be effective this analysis must involve affected members of the Acquisition Team. Member participation will vary from acquisition to acquisition, but most often contracting personnel and one or more of the following team members will be involved:

- Users-key source of information on the real needs of the Government;
- Requirement Managers-key decision makers;
- Suppliers-information source in market research and analysis; and
- Contracting Personnel-responsible for the effectiveness of the acquisition decision.

Potential impediments to competition. In various acquisition situations, you may use many different formats to organize a solicitation or contract. Regardless of the format, there are potential impediments to competition.

### Potential Impediments to Price Competition

<table>
<thead>
<tr>
<th>Solicitation Element</th>
<th>Potential Impediments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplies or Services and Prices</td>
<td>Failure to consolidate requirements</td>
</tr>
<tr>
<td>Requirements Documents</td>
<td>Use of vague or ambiguous terms</td>
</tr>
<tr>
<td></td>
<td>Excessive (i.e., gold plated) or impractical requirements</td>
</tr>
<tr>
<td></td>
<td>Use of design specifications when performance specifications are feasible</td>
</tr>
<tr>
<td></td>
<td>Brand-name specifications</td>
</tr>
<tr>
<td></td>
<td>Brand-name-or-equal specifications that admit few, if any, equals</td>
</tr>
<tr>
<td></td>
<td>Use of Government-unique specifications for commercial or commercial-type deliverables</td>
</tr>
<tr>
<td></td>
<td>Biased specifications (i.e., specifications geared to the unique features of a single product or of premium priced products)</td>
</tr>
<tr>
<td>Packaging and Marking</td>
<td>Noncommercial requirements</td>
</tr>
<tr>
<td>Inspection and Acceptance</td>
<td>Noncommercial requirements</td>
</tr>
<tr>
<td></td>
<td>Excessive requirements</td>
</tr>
<tr>
<td></td>
<td>Biased requirements</td>
</tr>
</tbody>
</table>
| Deliveries or Performance | ● Noncommercial terms  
● Delivery requirements not in tune with market cycles (e.g., requirements for “out-of-season” deliveries.)  
● Excessively tight deadlines |
| Contract Administration Data | ● Noncommercial requirements  
● Excessive requirements |
| Special Contract Requirements | ● Noncommercial requirements  
● Excessive requirements |
| Contract Clauses | ● Noncommercial terms and conditions  
● Excessive requirements (e.g., an excessively long warranty period, relative to commercial warranties)  
● Use of the wrong type of contract, given risks inherent in the work  
● Failure to use terms and conditions that could encourage competition |
| Instructions, Conditions, and Notices to Offerors | ● Noncommercial requirements  
● Excessive requirements |
| Evaluation for Award | ● Price given too little weight relative to technical factors  
● Biased evaluation factors (e.g., geared to unique features of a single product or of premium priced products) |

### 2.1 - Improving The Schedule

**Section Introduction.** Solicitations and contracts must include the product or service requirements that the contractor is expected to meet. These requirements should be specified in a manner designed to promote full and open competition and should only include restrictive provisions or conditions that are necessary to satisfy the minimum needs of the Government (see FAR 11.002(a)(1)).

This section covers the following strategies for improving purchase descriptions and related terms (i.e., Part I of the UCF-Schedule) to obtain more effective price competition:

- 2.1.1 - **Consolidate Requirements**
- 2.1.2 - **Describe Government Needs To Promote Competition**
- 2.1.3 - **Review Requirements Documents**
- 2.1.4 - **Use And Maintain Requirements Documents**
- 2.1.5 - **Acquire Other Than New Material**
- 2.1.6 - **Consider Delivery Or Performance Schedules**
- 2.1.7 - **Use Liquidated Damages**
- 2.1.8 - **Use Variation In Quantity**
- 2.1.9 - **Pursue Restrictive Requirement Relief**

### 2.1.1 - Consolidate Requirements

**Introduction.** Federal agencies are required to procure supplies in quantities that will:

- Result in the total cost and unit cost most advantageous to the Government, where practicable (FAR 7.202).
  - Total cost is the sum of allowable direct and indirect costs allocable to the contract, incurred or to be incurred, less any allocable credits, plus any allocable facilities capital cost of money (FAR 31.201-1).
  - Unit cost is the cost to complete any unit identified in the contract.
Not exceed the reasonable quantity expected to be required by the agency.

In contracting, the general assumption is that larger quantities will attract greater competition and result in lower prices due to manufacturing economies of scale and specialization. However, most inventory management systems do not consider the effect of larger quantities on price. Price is considered to be fixed regardless of the quantity purchased. Because inventory management systems typically do not consider the benefits of requirement consolidation, contracting personnel must often take primary responsibility for coordinating consolidation efforts.

**Consolidation decision.** As you review the Government requirements and prepare the schedules of supplies or services, consider the following:

**Consolidation Decision**

If you can answer "YES" to the following questions... AND... Then...

- Is the contracting office likely to receive more purchase requests for this item or service during the coming year?
- Can we reasonably estimate total organization requirements for the coming year?
- Can this requirement be combined with other known requirements to reduce the total cost to the Government?

**Consolidate purchase requests.** If you expect to receive purchase requests from a number of different activities for the same end item, encourage those activities to submit their purchase requests at roughly the same time. Then award a single contract for the aggregate quantity in the purchase requests. Consider polling the requiring activities by phone if you suspect that a number of requiring activities will need the same end item. You might also consider "riding" the contract of another agency that needs the same end items (see FAR 17.502).

**Place economic order quantities.** The major drawback to consolidating requirements is that you may acquire a warehouse full of supplies that are not immediately needed. The Government incurs a daily cost for storing unused supplies—a cost that may over time outweigh any price breaks from having purchased in bulk. Therefore, when deciding the quantity to acquire at any one time, you should minimize the total cost of both:

- Buying the supplies; and
- Storing the supplies.

This means balancing per unit prices against per unit storage costs, taking into account how many units are likely to be drawn from inventory each month. The "Economic Order Quantity" is the quantity that represents the best balance of acquisition and storage costs—this is the quantity that ideally you should award at any one time.

If inventory managers are available, work with them to determine the economic order quantity. You can also solicit information from offerors relevant to determining the economic order quantity.

**Use indefinite delivery contracts.** Indefinite-delivery contracts give the Government greater flexibility and buying power by combining requirements over an extended period of time with limited obligation regarding the exact time of delivery. They establish limits on the Government's obligation under the contract and provide flexibility in scheduling deliveries to minimize the costs to the Government for holding and managing inventory. See FAR 16.5 for specific details about the various types of indefinite-delivery contracts available.

**Comparison of contract types.** The following table compares the Government pricing leverage for the three indefinite-delivery contract types and a definite-quantity definite-delivery contract:

<table>
<thead>
<tr>
<th>Contract Type and Pricing Leverage</th>
<th>Contract Type</th>
<th>Pricing Leverage Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definite-Quantity-Definite-Delivery</td>
<td>First, if the entire quantity is known and contracted for at one time. Last, if individual small orders are required.</td>
<td></td>
</tr>
</tbody>
</table>
2.1.2 Describe Government Needs To Promote Competition
Need description objectives. FAR 11.002(a) requires that agencies describe Government needs in a manner designed to:
- Promote full and open competition, with due regard to the nature of the supplies or services to be acquired; and
- Only include restrictive provisions or conditions to the extent necessary to satisfy the minimum needs of the agency or as authorized by law.
Contracting officer responsibility. Normally, you will not be ultimately responsible for describing Government needs. That will normally be the responsibility of technical experts and the requiring activity. However, as a member of the Acquisition Team, you are responsible for sharing your acquisition knowledge in an attempt to meet the needs of the Government. See FAR 11 for additional information on describing Agency needs/requirements.

2.1.3 Consider Acquiring Other Than New Material
Introduction. Your market research may identify situations were it would be advantageous to the Government to acquire items that are not new (e.g., rebuilt items), former Government surplus property, or residual inventory. Such items may be available at a fraction of the price of new material. You must consider the best interests of the Government in deciding whether to solicit offers based on providing such items.
Contracting Officer Authorization. Do not permit a contractor to provide other than new material, former Government surplus property, or residual inventory unless the contractor has obtained the appropriate contracting officer authorizations required by FAR 52.211-5, Material Requirements clause.

2.1.4 Consider Delivery Or Performance Schedules
The time of delivery or performance is an essential contract element and must be clearly stated in solicitations and contracts. See FAR 11.4 for additional considerations related to delivery or performance schedules. Assure that delivery or performance schedules are realistic and meet the requirements of the acquisition. Remember that unreasonably tight or difficult to attain schedules:
- Tend to restrict competition;
- Are inconsistent with small business policies; and
- May result in higher prices.

2.1.5 Consider Liquidated Damages
In Government contracting, a liquidated damages clause is a stipulation by the Government and contractor to a sum of money to be recovered by the Government in the event the contractor fails to meet a specified contract delivery or performance requirement. Liquidated damages are normally assessed at a daily rate for each day of delay in meeting the delivery or performance requirement. A liquidated damages clause may be used in any type of contract, but such clauses are most commonly used in construction contracts. See FAR 11.5 for additional information on Liquidated Damages.
As you decide whether to include a liquidated damages clause in the contract, consider the probable effect on contract pricing, competition, and contract administration:
- Concern among prospective offerors about the cost risk associated with liquidated damages may increase contract prices and decrease competition. A tight delivery schedule will increase offeror concern. If the risk of timely performance is substantial, consider using positive performance incentives rather than liquidated damages.
- The cost/difficulty of contract administration will likely increase if the contractor perceives that timely performance is unlikely or impossible. Numerous claims may result as the contractor attempts to use Government action or inaction to justify its failure to meet the contract schedule.
Estimating a Reasonable Rate (FAR 11.502(b), FAR 11.503(b), and FAR11.503(c)). Whenever you use liquidated damages, you must calculate the rate on a case-by-case basis, based on an estimate of actual damage to the Government if the contractor does not perform on time. Assure that the rate is reasonable because a rate fixed without any reference to probable actual damages may be held to be a penalty, and therefore unenforceable.

If a liquidated damages clause is used in a construction contract, the contract should identify a daily rate for the assessment of liquidated damages. As a minimum, the rate should cover the estimated cost of inspection and superintendence for each day of delay in contract completion. Whenever the Government will suffer other specific losses due to the failure of the contractor to complete the work on time, the rate should also include an amount to cover those losses. Examples of specific losses include the:
- Cost of substitute facilities;
- Rental of buildings and/or equipment; or
- Continued payment of quarters allowances.

Usually, a single liquidated damages rate (e.g., $500 per day) is used from the date of contractually required delivery/performance until the contractor actually delivers or the contract is terminated. However, the probable damage to the Government may not follow a linear pattern.
- If appropriate to reflect probable damages to the Government, you may develop two or more incremental rates which provide for a declining rate assessment as the delinquency continues.
- You may also include an overall maximum dollar amount or period of time, or both, during which liquidated damages may be assessed, to ensure that the result is not an unreasonable assessment of liquidated damages.

2.2 - Improving Business Terms And Conditions

Section Introduction. This section covers the following strategies for selecting clauses and provisions for the solicitation to maximize price competition:
- 2.2.1 - Base The Contract Type On Risk Analysis
- 2.2.2 - Review Applicability Of Socioeconomic Requirements
- 2.2.3 - Match Payment And Finance Terms To Market Conditions
- 2.2.4 - Furnish Government Property
- 2.2.5 - Consider Warranty Requirements
- 2.2.6 - Optimize Price/Technical Tradeoffs

2.2.1 - Base The Contract Type On Risk Analysis

Introduction. The selection of contract type can have a significant effect on both competition and contract price. See FAR 16.1 for additional information on selecting contract types.

Two Contract Categories. Most contract types fit into one of two categories:
- Fixed-Price; or
- Cost-Reimbursement.

The biggest difference between the two is the assignment of risk.

In fixed-price contracts, the contractor is required to deliver the product specified and there is a maximum limit on the amount of money the Government must pay.

In cost-reimbursement contracts, the contract is required to deliver a "best effort" to provide the specified product. All allowable costs must be reimbursed, regardless of delivery, up to the level specified in the contract.

Risk, Contract Type, and Price. Analysis of the risk inherent in the contracting situation is the key element in the selection of an appropriate contract type. The relationship between risk, contract type, and price can be demonstrated by the following examples.

Examples:
- Selection of a fixed-price contract when the risks are beyond the contractor's control, as in many development contracts, will increase price and reduce competition.
- Selection of a cost-reimbursement contract when the risks are well within the contractor's control, as in most production contracts, will reduce the contractor's motivation to control costs.
*Commercial Items.* When acquiring commercial items, agencies shall use firm-fixed-price contracts or fixed-price contracts with economic price adjustment for the acquisition of commercial items, except, a time-and-materials contract or labor-hour contract (see Subpart 16.6) may be used for the acquisition of commercial services when specified conditions are met. See FAR 12.207(b).

*Major Types of Contracts.* The table below presents a comparison of the major contract types.

### Comparison of Major Types of Contracts

<table>
<thead>
<tr>
<th>Principal Risk to Be Mitigated</th>
<th>Firm Fixed-Price (FFP)</th>
<th>Indefinite Delivery (ID)</th>
<th>Fixed-Price Economic Price Adjustment (FPEPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs of performance can be estimated with a high degree of confidence. Thus, the contractor assumes the risk.</td>
<td>At time of award, delivery requirements are not certain.</td>
<td>Market prices for required labor and/or materials are likely to be highly unstable over the life of contract.</td>
<td></td>
</tr>
<tr>
<td>Use When</td>
<td>The requirement is well-defined. Commercial item Contractors are experienced in the requirement. Market conditions are stable. Financial risks are otherwise insignificant.</td>
<td><strong>Definite Quantity:</strong> The required quantity is known and funded at the time of award. <strong>Indefinite Quantity:</strong> The minimum quantity required is known and funded at award. <strong>Requirements:</strong> No commitment on quantity is possible at award.</td>
<td>Commercial item The market prices at risk are severable and significant. The risk stems from industry-wide contingencies beyond the contractor's control. The dollars at risk outweigh the administrative burdens of an FPEPA.</td>
</tr>
<tr>
<td>Elements</td>
<td>Firm fixed-price for each line item or one or more groupings of line items.</td>
<td>Performance period. Ordering activities and delivery points. Maximum or minimum limit (if any) on each order. Extent of each party’s obligation on quantity.</td>
<td>A fixed-price, ceiling on upward adjustment, and a formula for adjusting the price up or down based on: Established prices. Actual costs of the labor or materials. Labor or material indices.</td>
</tr>
<tr>
<td>Contractor Is Obliged To</td>
<td>Provide an acceptable deliverable at the time, place, and price specified in the contract.</td>
<td>Provide acceptable deliverables at the time and place specified in each order at the per unit price, within any ordering limits established by the contract.</td>
<td>Provide an acceptable deliverable at the time and place specified in the contract at the adjusted price.</td>
</tr>
<tr>
<td>Contractor Incentive (Other Than Maximizing Goodwill)</td>
<td>Generally realizes an additional dollar of profit for every dollar that costs are reduced.</td>
<td>Incentive will depend on the contract pricing arrangement.</td>
<td>Generally realizes an additional dollar of profit for every dollar that costs are reduced.</td>
</tr>
<tr>
<td>A Typical Application</td>
<td>Commercial supplies and services.</td>
<td>Long-term contracts for commercial supplies or support services.</td>
<td>Long-term contracts for commercial supplies during a period of high inflation.</td>
</tr>
<tr>
<td>Principal Limitations In FAR Parts 16, 32, 35, and 52</td>
<td>Generally not appropriate for R&amp;D. Fixed-price arrangements may be used for R&amp;D to</td>
<td>May use any appropriate cost or pricing arrangement that complies with FAR Part 16.</td>
<td>Must be justified.</td>
</tr>
</tbody>
</table>
the extent that goals, objectives, specifications, and cost estimates are sufficient to permit such a preference. But see FAR 35.

<table>
<thead>
<tr>
<th>Variants</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Fixed-Price Level of Effort</td>
<td>Multiple awards preferred for most indefinite quantity contract items.</td>
</tr>
<tr>
<td></td>
<td>Single award required for requirements contract items.</td>
</tr>
<tr>
<td></td>
<td>Multiple awards preferred for most indefinite quantity contract items.</td>
</tr>
<tr>
<td></td>
<td>Single award required for requirements contract items.</td>
</tr>
<tr>
<td></td>
<td>Cost estimates can be estimated with confidence only for the first year of performance.</td>
</tr>
<tr>
<td></td>
<td>Labor or material requirements for work are moderately uncertain. Hence, the Government assumes part of the risk.</td>
</tr>
<tr>
<td></td>
<td>Ceiling price can be established that covers the most probable risks inherent in the nature of the work.</td>
</tr>
<tr>
<td></td>
<td>The proposed profit sharing formula would motivate the contractor to control costs and meet other objectives.</td>
</tr>
</tbody>
</table>

### Comparison of Major Types of Contracts

<table>
<thead>
<tr>
<th>Principal Risk to Be Mitigated</th>
<th>Fixed-Price Award Fee (FPAF)</th>
<th>Fixed-Price Prospective Redetermination (FPPR)</th>
<th>Fixed-Price Incentive (FPI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptance criteria are inherently judgmental, with a corresponding risk that the end user will not be fully satisfied.</td>
<td>Costs of performance can be estimated with confidence only for the first year of performance.</td>
<td>Labor or material requirements for work are moderately uncertain. Hence, the Government assumes part of the risk.</td>
<td></td>
</tr>
<tr>
<td>Judgmental standards can be fairly applied. The potential fee is large enough to both: Provide a meaningful incentive and Justify the administrative burdens of an FPAF.</td>
<td>The Government needs a firm commitment from the contractor to deliver the supplies or services during subsequent years. The dollars at risk outweigh the administrative burdens of an FPPR.</td>
<td>Ceiling price can be established that covers the most probable risks inherent in the nature of the work. The proposed profit sharing formula would motivate the contractor to control costs and meet other objectives.</td>
<td></td>
</tr>
<tr>
<td>A firm fixed-price Fee pool Standards for evaluating performance. Criteria for determining a &quot;fee&quot; based on performance against the standards.</td>
<td>Fixed price for the first period. Proposed subsequent periods (at least 12 months apart). Timetable for pricing the next period(s).</td>
<td>Ceiling price</td>
<td></td>
</tr>
<tr>
<td>Provide acceptable deliverables at the time and place specified in the contract at the price established for each period.</td>
<td>Contractor must have an adequate accounting system that supports the pricing periods. Prompt redeterminations.</td>
<td>Target cost Target profit Delivery, quality, and/or other performance targets (optional) Ratio for adjusting profit based on actual costs and/or performance.</td>
<td></td>
</tr>
<tr>
<td>Generally realizes an additional dollar of profit for every dollar that costs are reduced; earns an additional fee for satisfying the performance standards.</td>
<td>Must be negotiated. Contractor must have an adequate accounting system that supports the pricing periods. Prompt redeterminations.</td>
<td>Must be justified. Must be negotiated. Contractor must have an adequate accounting system. Targets must be supported by the cost data.</td>
<td></td>
</tr>
</tbody>
</table>
**Variants**

Retroactive Redetermination.

Firm or Successive Targets.

<table>
<thead>
<tr>
<th>Principal Risk to Be Mitigated</th>
<th>Use When</th>
<th>Elements</th>
<th>Contractor Is Obliged To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor hours, labor mix, and/or material requirements (among other things) necessary to perform are highly uncertain and speculative. Hence, the Government assumes the risks inherent in the contract, benefiting if the actual cost is lower than the expected cost; losing if the work cannot be completed within the expected cost of performance. Some cost type contracts include procedures for raising or lowering the fee as an incentive for the contractor to perform at lower cost and/or attain performance goals.</td>
<td>Formulas relating fee to performance (e.g. to actual costs) would be unworkable or of marginal utility.</td>
<td>Estimated cost</td>
<td>Make a good faith effort to meet the Government's needs within the estimated cost in the Schedule.</td>
</tr>
<tr>
<td>Objective relationship can be established between the fee and such performance measures as actual costs, delivery dates, performance benchmarks, and the like.</td>
<td>Objective incentive targets are not feasible for critical aspects of performance. Judgemental standards can be fairly applied. Potential fee would provide a meaningful incentive.</td>
<td>Target cost</td>
<td>Realizes a higher fee by meeting judgmental performance standards.</td>
</tr>
<tr>
<td>Estimated cost Standards for evaluating performance Base and maximum fees Procedures for adjusting “fee” based on performance against the standards</td>
<td>Performance targets (optional) Minimum, maximum, and target fee Ratio for adjusting fee based on actual costs and/or performance</td>
<td>Realizes a higher fee by completing the work at a lower cost and/or by meeting other objective performance targets.</td>
<td>Research and development of the prototype for a major system.</td>
</tr>
<tr>
<td>Realizes a higher rate of return (i.e., fee divided by total cost) as total cost decreases.</td>
<td>Research study.</td>
<td>Large scale research study.</td>
<td></td>
</tr>
</tbody>
</table>

**A Typical Application**

Research study. Research and development of the prototype for a major system.

Principal Limitation In FAR Parts 16, 32, 35, and 52

Variants

Completion or Term.

---

**Comparison of Major Types of Contracts**

<table>
<thead>
<tr>
<th>Variants</th>
<th>Retroactive Redetermination.</th>
<th>Firm or Successive Targets.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost-Plus-Fixed-Fee (CPFF)</strong></td>
<td><strong>Cost-Plus-Incentive-Fee (CPIF)</strong></td>
<td><strong>Cost-Plus-Award-Fee (CPAF)</strong></td>
</tr>
<tr>
<td>Principal Risk to Be Mitigated</td>
<td>Use When</td>
<td>Elements</td>
</tr>
<tr>
<td>Labor hours, labor mix, and/or material requirements (among other things) necessary to perform are highly uncertain and speculative. Hence, the Government assumes the risks inherent in the contract, benefiting if the actual cost is lower than the expected cost; losing if the work cannot be completed within the expected cost of performance. Some cost type contracts include procedures for raising or lowering the fee as an incentive for the contractor to perform at lower cost and/or attain performance goals.</td>
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<tr>
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<tr>
<td>Realizes a higher rate of return (i.e., fee divided by total cost) as total cost decreases.</td>
<td>Research study.</td>
<td>Large scale research study.</td>
</tr>
</tbody>
</table>

**A Typical Application**

Research study. Research and development of the prototype for a major system.

Principal Limitation In FAR Parts 16, 32, 35, and 52

Variants

Completion or Term.
Principal Risk to Be Mitigated: Labor hours, labor mix, and/or material requirements (among other things) necessary to perform are highly uncertain and speculative. Hence, the Government assumes the risks inherent in the contract, benefiting if the actual cost is lower than the expected cost; losing if the work cannot be completed within the expected cost of performance.

Use When: Hourly labor rates can be firmly defined at contract award but hours required to complete the required task cannot.

Elements: Hourly labor rates can be firmly defined at contract award but hours required to complete the required task cannot.

Contractor Is Obliged To: Make a good faith effort to meet the Government's needs within the estimated cost in the Schedule.

Contractor Incentive (Other Than Maximizing Goodwill): Cost sharing shares the cost of providing a deliverable of mutual benefit.

A Typical Application: Joint research with educational institutions.

Principal Limitations In FAR Parts 16, 32, 35, and 52: The contractor must have an adequate accounting system. The Government must exercise surveillance during performance to ensure use of efficient methods and cost controls. Must be negotiated. Must be justified. Must include the applicable FAR Limitation of Cost clause.

Contracting officer must determine in writing that no other contract type is suitable. Labor rate must be negotiated and justified. The Government must exercise appropriate surveillance to ensure efficient performance. Contract must include a ceiling price.

Variants: Labor Hour

Notes to tables:
Note 1 - Goodwill being the value of the name, reputation, location and other intangible assets of a firm.
Note 2 - Performance is evaluated by an Award Fee Panel with fee determined by a Fee Determining Official. Fee determinations are not subject to contract disputes provisions.
Note 3 - The CPFF contract is commonly used in situations where the Government is more interested in technical excellence than cost control. However, you must be aware that higher cost does not necessarily equal technical excellence. Contractors may attempt to shift unnecessary resources to CPFF contracts to control costs on other contracts.

2.2.2 - Review Applicability Of Socioeconomic Requirements
Introduction. The Government has established socioeconomic programs to achieve national social and economic goals, but these programs can also limit potential sources. As you implement these programs, always consider the probable effect on competition and contract pricing. See FAR 8 for information on required sources of supply and FAR 19 for information on Small Business Programs.

2.2.3 - Match Payment And Finance Terms To Market Conditions
Introduction. See FAR 32 for policies and procedures for contract financing and other payment matters.
Under cost-reimbursement contracts, contractors are typically reimbursed for costs incurred on a monthly basis. Under fixed-price contracts, payment is made in a lump sum at contract completion unless other financing terms are provided for in the contract. Sometimes, you can attract a greater level of competition and lower-priced offers by providing financing. However the costs of extending such financing must be considered.

Contractor Financing. Requiring contractors to fund the entire contract may severely limit competition, particularly with large contracts and long performance periods. Any firm that does submit an offer will probably offer a higher price to cover the cost of working capital. Recognizing the potential effects of required contractor funding on competition and pricing, you may want to consider other financial terms. However, there are negative aspects to Government funding. Government funds are not free. The Government must also pay interest on borrowed capital. In addition, when the Government provides working capital support, the contractor has both the funds and the product. In the event of contractor default or bankruptcy, the Government may lose both the product and the funds.

Circumstances for Financing Commercial Items. In some markets, commercial buyers commonly provide contract financing. You may include appropriate financing terms in contracts for commercial purchases when doing so will be in the best interest of the Government (see FAR 32.202-1).

Do not automatically include financing in commercial item contracts. Consider customary commercial financing arrangements as part of your market research. In particular, consider:

- The extent to which other buyers provide contract financing for purchases in that market;
- The overall level of financing normally provided;
- The amount or percentages of any payments equivalent to advance payments;
- The basis for any payments equivalent to commercial interim payments as well as the frequency, and amounts of percentages; and
- Methods of liquidation of contract financing payments and any special or unusual payment terms applicable to delivery payments.

### 2.2.4 - Furnish Government Property

**Introduction.** Government-furnished property can be used in several ways to encourage competition and assure overall price reasonableness. See FAR 45 for information related to Government Property.

**Description.** The term property includes facilities, material, special tooling, special test equipment, and agency peculiar property. Different types of property can be used to affect competition and pricing.

**Overview of Government Property.** The table below provides an overview of the various types of Government property and how each type can be used to affect competition and pricing.

<table>
<thead>
<tr>
<th>Furnishing Government Property</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Property</strong></td>
</tr>
<tr>
<td>Facilities (FAR 45.302)</td>
</tr>
<tr>
<td>Material (FAR 45.301)</td>
</tr>
<tr>
<td>Special Tooling (FAR 45.101)</td>
</tr>
</tbody>
</table>
Substantial modification, or alterations, their use is limited to the development or production of particular supplies or parts thereof, or to particular services. It does not include material, special test equipment, facilities (except foundations and similar improvements necessary for installing special tooling), general or special machine tools, or similar capital items.

Special Test Equipment (FAR 45.101) Single or multipurpose integrated test units engineered, designed, fabricated, or modified to accomplish special purpose testing in performing a contract. It consists of items or assemblies of equipment including standard or general purpose items or components that are interconnected and interdependent so as to become a new functional entity for special testing purposes. It does not include material, special tooling, facilities (except foundations and similar improvements necessary for installing special test equipment), and plant equipment items used for general plant testing purposes.

Like special tooling, Government provision of special test equipment increases competition by reducing the need for investment that can only be used on one contract or project. Government ownership and right to move test equipment limit producer ability to obtain a lock on the competition because of unique tooling capacity.

2.2.5 - Optimize Price/Technical Trade-Offs

**Technical Factors that Can Reduce Competition.** The factors already considered in this chapter have the greatest effect on competition and contract price. There are, however, many other technical and business factors that can reduce competition and increase prices. These include:

- Security requirements;
- Payment provisions that increase contractor investment;
- Packaging requirements that require survival under extreme conditions;
- Unclear instructions, certifications, and notices to bidders/offerors;
- Unclear source selection criteria; and
- Conflicting and restrictive general contract clauses.

**Technical Factors and Price.** Technical factors could invite offerors to submit higher prices as the tradeoff for a technically superior offer. Key questions to ask regarding proposed technical evaluation factors:

- Will the technical evaluation factor unnecessarily force the acquisition into a higher-priced market segment?
- Will the technical factor constructively amend the specifications to require more than the Government's actual minimum needs?
- Given the likely effect on contract price, is the factor truly necessary to minimize the technical or business risks inherent in the contract requirements?
- Will use of the technical factor likely result in a "greater value" for the taxpayer?
- Are technical factors clear such that offerors understand the Government's priorities and how offerors will be evaluated in accordance with these priorities?

- 3.0 - Chapter Introduction
- 3.1 - Certified Cost or Pricing Data
- 3.2 - Certified Cost or Pricing Data Exceptions
  - 3.2.1 - Adequate Price Competition Exception
  - 3.2.2 - Price Set by Law or Regulation Exception
  - 3.2.3 - Commercial Item Exception
  - 3.2.4 - Waiver Exception
- 3.3 - Data Other Than Certified Cost or Pricing Data
3.0 - Chapter Introduction
This chapter covers the steps you will take to determine what data will be needed from offerors to support the pricing decision.

The policies described in this chapter for obtaining and evaluating certified cost or pricing data or data other than certified cost or pricing data from offerors apply only to acquisition by negotiation including those below the Simplified Acquisition Threshold acquired using FAR 13 and those including commercial items acquired using FAR 12.

NEVER require offerors to submit certified cost or pricing data or data other than certified cost or pricing data with sealed bids. For sealed bidding, you may only require bidders to submit original worksheets and other data used in bid preparation when there is an alleged mistake in bid (FAR 14.407-3(g)(2)).

Flow Chart of the Decision Process. This flow chart outlines the decision process that you should follow to determine what (if any) information to require from offerors/contractors.

Cost or Pricing Data (FAR 2.101). Cost or pricing data:
- Are all facts that, as of the date of price agreement or, if applicable, another date agreed upon between the parties that is as close as practicable to the date of agreement on price, prudent buyers and sellers would reasonably expect to affect price negotiations significantly.
- Are factual, not judgmental, and are therefore verifiable.
- Include the data that form the basis for the prospective offeror's judgment about future cost projections. The data do not indicate the accuracy of the prospective contractor's judgment.
- Are more than historical accounting data. They are all the facts that can be reasonably expected to contribute to the soundness of estimates of future costs and to the validity of
determinations of costs already incurred.

- Include such factors as:
  - Vendor quotations;
  - Nonrecurring costs;
  - Information on changes in production methods and in production or purchasing volume;
  - Data supporting projections of business prospects and objectives and related operations costs;
  - Unit-cost trends such as those associated with labor efficiency;
  - Make-or-buy decisions;
  - Estimated resources to attain business goals; and
  - Information on management decisions that could have a significant bearing on costs.

Certified Cost or Pricing Data (FAR 2.101). Certified cost or pricing data:

- Are cost and pricing data that were required to be submitted in accordance with FAR 15.403-4 and 15.403-5 and have been certified, or are required to be certified, in accordance with FAR 15.406-2. This certification states that, to the best of the person's knowledge and belief, the cost or pricing data are accurate, complete, and current as of a date certain before contract award.

Data Other Than Certified Cost or Pricing Data (FAR 2.101). Data other than certified cost or pricing data:

- Are pricing data, cost data and judgmental information necessary for the contracting officer to determine a fair and reasonable price or to determine cost realism that are not required to be certified as accurate, complete, and current, in accordance with FAR 15.406-2.

- May include sales data and any data reasonably required to explain the offeror's estimating process including but not limited to –
  - The Judgmental factors applied and the mathematical or other methods used in the estimate, including those used in projecting from known data; and
  - The nature and amount of any contingencies included in the proposed price.

- Includes "cost or pricing data" but for which certification is not required.

Order of Preference for Information (FAR 15.402). The contracting officer must obtain the minimum amount of information required to allow an adequate determination that a contract price is fair and reasonable. To the extent that certified cost or pricing data are not required by FAR 15.403-4, the contracting officer must generally use the following order of preference in determining the type of information required:

1. No additional data from the offeror, if the price is based on adequate price competition, except as provided by FAR 15.403-3(b). You may require offerors to submit data other than certified cost or pricing data to determine the cost realism of competing offers or to evaluate competitive approaches.

2. Data other than certified cost or pricing data:
   (i) Data related to prices (e.g., established catalog or market prices or sales to governmental and non-governmental entities), relying:
      (a) First on data available within the Government. For example, data in existing contract files for previous buys, data from market research, etc. Second, on data obtained from sources other than the offeror. For example, data from catalogs, vendor price lists, etc. If necessary, on data obtained from the offeror. When obtaining data from the offeror is necessary, unless an exception under FAR 15.403-1(b)(1) or (2) applies, such data submitted by the offeror shall include, at a minimum, appropriate data on the prices at which the same or similar items have been sold previously, adequate for evaluating the reasonableness of the price. For example, Government and non-Government sales data for the same item in similar quantities, company catalogs, discounts, etc.
   (ii) Data related to cost (hours by labor category and direct and indirect rates, or possibly full cost data where absolutely necessary). Because the pricing action is exempt from TINA, the contractor would not be required to sign a certificate of current cost or pricing data.

3. Cost or Pricing Data. The contracting officer should use every means available to ascertain whether a fair and reasonable price can be determined before requesting cost or pricing data. Contracting officers must not require unnecessarily the submission of cost or pricing data, because it leads to increased proposal preparation costs, generally extends acquisition lead time, and consumes additional contractor and Government resources.

Remember, this paragraph applies to actions when certified cost or pricing data are not required by
Rationale: When certified cost or pricing data are not otherwise required by FAR 15.403-4, FAR 15.403-4(a)(2) provides that, unless prohibited because an exception at FAR 15.403-1(b) applies, the head of the contracting activity, without power of delegation, may authorize the contracting officer to obtain certified cost or pricing data for pricing actions below the pertinent threshold in FAR 15.403-4(a)(1), provided the action exceeds the simplified acquisition threshold, because without certified cost or pricing data, there is no other means to determine price reasonableness. These should be rare circumstances.

EXAMPLE: A contractor has proposed to provide aircraft repair for $680,000, just under the TINA threshold. Based on technical input and market research the contracting officer does not think the subject repairs should be so costly, and the independent government cost estimate estimates the work at approximately $380,000. The contracting officer has no way to evaluate the reasonableness of the price without certified cost or pricing data. Because of the sensitivity of the program for which the solicitation was issued, the very tight budget constraints, and the fact that this is a sole source provider of this type of repair that has overcharged the government in the past, the contracting officer obtains the Head of the Contracting Activity’s approval to require “Certified Cost or Pricing Data,” obtains field pricing assistance in evaluating the certified cost or pricing data and requires a certificate of current cost or pricing data.

Solicitation Price-Related Information Requirements (FAR 15.403-5 and FAR 15.408(l) and (m)). You may require offerors to submit pricing-related data at any time prior to the close of negotiations. However, identifying all requirements in the solicitation will permit offerors to gather and document the required data during proposal preparation. If you require data after proposals are received, the contracting process must be delayed while the offeror gathers and documents the data required.

The solicitation must specify:

- Whether certified cost or pricing data are required;
- That, when certified cost or pricing data are required, the offeror may submit a request for exception from the requirement to submit certified cost or pricing data;
- Whether data other than certified cost or pricing data is required;
- Necessary preaward or post award access to the offeror’s records;
- The format required for submission of certified cost or pricing data or data other than certified cost or pricing data (the FAR Table 15-2 format, a specified alternate format, or a format selected by the offeror).

Price-Related Data Requirements After Receipt of Offers (FAR 15.403-4(c)). Decisions on pricing-related information requirements continue after proposals are received:

- If offerors were required to submit certified cost or pricing data and:
  - An offeror submitted the data, but the contracting officer later finds that an exception applies, never require the offeror to certify that the data are accurate, complete, and current. Instead treat the data as data other than certified cost or pricing data.
  - No exception applies, but an offeror initially refuses to provide the required data, or the data provided are so deficient as to preclude adequate analysis and evaluation, the contracting officer must again attempt to obtain the data. If the offeror persists in refusing to provide the needed data, the contracting officer must withhold contract award or price adjustment and refer the contract action to higher authority, with details of the attempts made to resolve the matter and a statement on the practicality of obtaining the supplies or services from another source.
- If offerors are not required to submit certified cost or pricing data and the contracting officer later determines that the data are necessary, the contracting officer should require the offeror to submit the required data prior to the close of contract negotiations.
- If the Government does not require submission of certified cost or pricing data or data other than certified cost or pricing data, but the contracting officer later determines that data other than certified cost or pricing data are needed from the offeror to determine price reasonableness, the contracting officer should require the offeror to submit the necessary data prior to the close of contract negotiations.

3.1 - Cost or Pricing Data
Decision Process for Requiring Cost or Pricing Data (FAR 15.402(a)(3), FAR 15.403-1(b), and FAR
The Truth in Negotiations Act (TINA) requires that you obtain certified cost or pricing data in specific contracting situations, described in this section. However, the Act also provides exceptions to that requirement, also described in the next section. Never require an offeror to submit certified cost or pricing data unless the contracting officer concludes that none of the exceptions to the certified cost or pricing data requirement are appropriate. This refers to requesting "certified cost or pricing data," meaning that which is certified to be accurate, current and complete. The contracting officer can always obtain "data other than certified cost or pricing data," as defined at FAR 2.101, to the extent the data is needed to determine fair and reasonable prices. Although the same type of pricing or cost data may be obtained, when required, the difference is that under "data other than certified cost or pricing data" certification of the data is not required.

Because you must consider the exceptions before requiring certified cost or pricing data, the decision to require certified cost or pricing data is the last determination in the flow chart presented at the beginning of this chapter. However, in the chapter, we present this section first to identify the general requirement from which contracting officers should consider possible exceptions.

Situations Requiring Certified Cost or Pricing Data (FAR 15.403-4(a)). When no exception is appropriate, obtain certified cost or pricing data before accomplishing any of the following actions when the price is expected to exceed the certified cost or pricing data threshold:

- The award of any negotiated contract (except for undefinitized actions such as letter contracts).
- The award of a subcontract at any tier, if the contractor and each higher-tier subcontractor were required to furnish certified cost or pricing data.
- The modification of any sealed bid or negotiated contract (whether or not cost or pricing data were initially required). This requirement also applies to subcontracts if the contractor and each higher-tier subcontract have been required to furnish cost or pricing data (but see waivers at 15.403-1 (c)(4) ).
  - When deciding whether certified cost or pricing data are required, sum the value of related increases and decreases in contract requirements. For example, a $200,000 modification resulting from a reduction of $500,000 and an increase of $300,000 is an $800,000 price adjustment when determining the need for certified cost or pricing data.
  - Do not sum the value of unrelated and separately priced changes for which certified cost or pricing data would not otherwise be required. Such changes may be included in the same contract modification for administrative convenience.

Contract Certified Cost or Pricing Data Threshold. For a new contract, the applicable certified cost or pricing data threshold is the threshold that is in effect on the date of agreement on price, or the date of award, whichever is later. The certified cost or pricing data threshold is contained in FAR 15.403-4(a)(1).

Subcontract And Modification Certified Cost or Pricing Data Threshold. For prime contract modifications, new subcontracts at any tier, and subcontract modifications, the applicable certified cost or pricing data threshold is established by the prime contract.

- For most contracts, the applicable certified cost or pricing data threshold is the current threshold on the date of agreement on price, or the date of award, whichever is later.
- Some older contracts specify a dollar threshold that does not automatically change as the current threshold changes. However, a specific dollar threshold can be updated using a bilateral contract modification.

HCA-Approved Certified Cost or Pricing Data Below the Threshold (FAR 2.101, FAR 15.403-1, and FAR 15.403-4(a)(2)). The contracting officer may require certified cost or pricing data submission at or below the certified cost or pricing data threshold, but only if all three of the following requirements are met:

- The estimated value of the contract action exceeds the simplified acquisition threshold.
  - The simplified acquisition threshold for most noncommercial acquisitions is currently $150,000.
  - For contracts awarded and performed, or purchases to be made, outside the United States in support of contingency operations, the simplified acquisition threshold is $1,000,000.
  - For contracts awarded and performed, or purchases to be made, inside the United States in support of contingency operations, the simplified acquisition threshold is $300,000.
See the definition for Simplified Acquisition Threshold at FAR 2.101 for the current thresholds.

- No exception to obtaining certified cost or pricing data applies. (For example, never require certified cost or pricing data when contracting for a commercial item.)
- The head of the contracting activity (without power of delegation) authorizes the certified cost or pricing data requirement.
  - The head of the contracting activity must justify the certified cost or pricing data requirement.
  - File documentation must include a written finding that certified cost or pricing data are necessary to determine whether an offered price is fair and reasonable and the facts supporting that finding.

3.2 - Cost or Pricing Data Exceptions
Section Introduction. This section will present a brief review of points to consider in determining whether an exception applies to certified cost or pricing data requirements. Topics that will be covered include:

- 3.2.1 - Adequate Price Competition Exception
- 3.2.2 - Price Set By Law Or Regulation Exception
- 3.2.3 - Commercial Item Exception
- 3.2.4 - Waiver Exception

General Guidelines on Exceptions (FAR 15.403-4(a)). Never require certified cost or pricing data when an exception to certified cost or pricing data requirements applies. In determining whether a specific exception applies, consider the conditions for granting that exception and the special issues associated with granting that exception. Keep in mind, however, that the contracting officer can obtain "data other than certified cost or pricing data," which could include full cost supporting data, to the extent that the data is required in order to determine that prices are fair and reasonable. In the case of "data other than certified cost or pricing data," certification of the data is not required.

Contract Options (FAR 15.403-2(a)). Never require certified cost or pricing data when exercising an option at the price established at contract/subcontract award or initial contract/subcontract negotiation.

Funding Adjustments (FAR 15.403-2(b)). Never require certified cost or pricing data for proposals used solely for overrun funding or interim billing price adjustments.

Actions at or Below the Certified Cost or Pricing Data Threshold. (FAR 15.403-4(a)(2)) Never require certified cost or pricing data for contract or subcontract actions priced at or below the certified cost or pricing data threshold unless the requirement is authorized by the head of the contracting activity in accordance with FAR 15.403-4(a)(2).

Never require certified cost or pricing data for contract or subcontract actions priced at or below the simplified acquisition threshold FAR 15.403-1(a).

3.2.1 Adequate Price Competition Exception
The contracting officer should keep in mind that, competition can exist and not be adequate; or can be "adequate" but not truly effective and hence not be adequate. The Government is seeking adequate & effective competition.

Conditions for New Contract or Subcontract Exception (FAR 15.403-1(b)(1) and FAR 15.403-1(c)(1)).

Never require certified cost or pricing data when the contracting officer determines that the agreed-upon prices are based on adequate price competition. A price is based on adequate price competition if:

- Two or more responsible offerors, competing independently, submit priced offers that satisfy the Government's expressed requirement and both of the following conditions are met:
  - Award will be made to the offeror whose proposal represents the best value to the Government where price is a substantial factor in the source selection;
  - There is no finding that the price of the otherwise successful offeror is unreasonable. Any finding that a proposed price is unreasonable must be supported by a statement of the facts and approved at a level above the contracting officer;

- Per USD AT&L memorandum dated 24 Nov 2010 re: Improving Competition in Defense Procurements, contracting officers will no longer use the standard at FAR 15.403-1(c)(ii)or (iii) to determine that the offered price is based on adequate competition when only one offer is received.
If a solicitation was open for less than 30 days and only one offer was received, the contracting officer shall re-advertise the solicitation for a minimum of an additional 30 days, unless a waiver is obtained from the head of the contracting activity. Further, if the solicitation was open for at least 30 days, or has been re-advertised and still only one offer is received, the contracting officer shall conduct negotiations with the offeror unless this requirement is specifically waived by the head of the contracting activity. The basis for these negotiations shall be either certified cost or pricing data or data other than certified cost or pricing data, as appropriate. In no event, should the negotiated price exceed the price originally offered.

Certified Cost or pricing data when modifying a contract (FAR 52.215-21(a)(ii)).

Never require certified cost or pricing data for a modification of a contract or subcontract for a commercial item if:

- The original contract or subcontract was granted an exception from certified cost or pricing data requirements because:
  - The price agreed upon was based on adequate price competition or prices set by law or regulation, or
  - The contract or subcontract was for a commercial item; and
- The modification would not change the contract or subcontract from a contract or subcontract for acquisition of a commercial item to a contract or subcontract for acquisition of an item other than a commercial item.

To have adequate price competition, price must be a substantial factor in the contract award decision, but neither the FAR nor the law define what weight price must have to be considered a substantial factor.

- In general, the weight assigned must be large enough to cause offerors to seriously consider price in preparing their offers.
- The Comptroller General (CGEN) has found adequate price competition in cases where price was assigned a weight of only 20 percent in the award decision. However, price is usually assigned a weight that is higher than 20 percent.

Recent Competition. The FAR does not provide any guidelines on how recent competition must be to be considered as a basis for excepting an offeror from submitting certified cost or pricing data. The term "recent" must be judged subjectively.

- The price must be recent enough to use as a basis for determining price reasonableness.
- Normally, competition is considered recent if it took place within the last 12 months.
- However, be careful.
  - Before you except an offeror from submission of certified cost or pricing data based on recent competition, examine the market to see how market conditions have changed since the last competitive acquisition.
  - If the product market is extremely volatile, a price that is only a few months old may not be recent enough to use as a basis for determining price reasonableness.

3.2.2 Price Set By Law or Regulation Exception

Conditions for Exception (FAR 15.403-1(b)(2), FAR 15.403-1(c)(2), and FAR 52.215-21(a)(1)). Never require certified cost or pricing data for a new contract, new subcontract, or a contract or subcontract modification when the contracting officer determines that the agreed-upon prices are based on prices set by law or regulation. Pronouncements in the form of periodic rulings, reviews, or similar actions of a governmental body, or embodied in the laws, are sufficient to set a price.

Applicable Items. To apply this exception, the price of the item that you are acquiring must be set by law or regulation. You are not permitted to use this exception for items similar to those priced by law or regulation.

Request for Exception (FAR 52.215-20(a)(1) and FAR 52.215-21(a)(1)). When a solicitation or contract clause requires submission of certified cost or pricing data, an offeror/contractor may request an exception using prices set by law or regulation. The request for exception must (as a minimum):

- Identify the law or regulation that establishes the price offered.
- Include a copy of any periodic ruling, review, or similar action of a governmental body used to establish the offered price, unless it was previously submitted to the contracting office.
3.2.3 Commercial Item Exception

Conditions for Exception (FAR 15.403-1(b)(3), FAR 15.403-1(b)(5), and FAR 15.403-1(c)(3)). Never require certified cost or pricing data for a new contract, new subcontract, or contract or subcontract modification when you are acquiring a commercial item.

- Any acquisition for an item that meets the FAR definition of a commercial item is excepted from certified cost or pricing data requirements.
- Any contract modification that does not change the item from a commercial item to a noncommercial item is also excepted from certified cost or pricing data requirements.

Commercial Item Identification The definition of a commercial item is found at (FAR 2.101). The concept behind the commercial items pricing exception is that the item, its value, and its price are results of product & pricing supply and demand, disciplined by the commercial marketplace where buyers and sellers have other commercial alternatives which compete with the commercial item(s) being procured.

In some situations when a commercial item is to be modified as a part of the contract, and the modification fits the minor modification portion of the commercial item definition, the cost/price related to that modification of the commercial item is not excepted from the TINA requirement to obtain certified cost or pricing data. The cost/price related to the basic commercial item is excepted. These situations are addressed in FAR 15.403-1(c)(3)(ii). For acquisitions funded by DoD, NASA, or Coast Guard, such modifications of a commercial item are exempt from the requirement for submission of certified cost or pricing data provided the total price of all such modifications under a particular contract action does not exceed the greater of the threshold for obtaining certified cost and pricing data in 15.403-4 or 5 percent of the total price of the contract at the time of contract award.

Request for Exception (FAR 52.215-20(a)(1) and FAR 52.215-21(a)(1)). When a solicitation or contract clause requires submission of certified cost or pricing data, a firm may request a commercial item exception. At a minimum, the request for exception must include information on prices at which the same or similar items have previously been sold in the commercial market that is adequate for evaluating the reasonableness of the current acquisition price.

- For catalog items, the firm should include:
  - A copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted;
  - A copy or description of current discount policies and price lists (published or unpublished) (e.g., wholesale, original equipment manufacturer, or reseller); or
  - An explanation of the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities.

- For market-priced items, the firm should include:
  - The source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts; and
  - A description of the nature of the market.

- For items included on an active Federal Supply Service Multiple-Award Schedule contract, the firm should include proof that an exception has been granted for the schedule item.

3.2.4 Waiver Exception

Conditions for Exception (FAR 15.403-1(b)(4) and FAR 15.403-1(c)(4)). Never require certified cost or pricing data for a new contract, new subcontract, or contract or subcontract modification when the head of the contracting activity waives the requirement for certified cost or pricing data.

- The authorization for the waiver and the supporting rationale must be in writing.
- The head of the contracting activity (without power of delegation) may consider waiving the certified cost or pricing data requirement in exceptional cases (see FAR 15.403-1(c)(4)). DoD contracting activities must follow more stringent criteria for granting of exceptional case TINA waivers. Section 817 of Public Law 107-314 (NDAA 2003) established the criteria that must be met in order for DoD to grant a TINA waiver under the exceptional circumstances exception (See
DFARS 215.403-1(c)(4)). The criteria are:

1. The property or services cannot reasonably be obtained under the contract, subcontract, or modification, without the granting of the waiver;
2. The price can be determined to be fair and reasonable without the submission of certified cost or pricing data; and
3. There are demonstrated benefits to granting the waiver.

It is DoD policy to apply this waiver authority only to situations where the Government could not otherwise obtain the needed product or service without the waiver. An example would be when a commercial business segment offers a non-commercial item that is essential to DoD’s mission but is not available from other sources, and the company refuses to accept the TINA requirements. In such cases, a TINA waiver may be granted, provided the price can be determined fair and reasonable without submission of the certified cost and pricing data. However, in such cases, the procuring activity shall also develop a strategy for procuring the item in the future (e.g., develop a second source, develop an alternative product that satisfies the department’s needs, have the Government produce the product, continue to use this source with a TINA waiver because the business case does not support any other alternative).

It is important for DoD to apply the TINA waiver authority in a judicious manner. For example, TINA waivers should not be granted to contractor business segments that normally perform Government contracts subject to TINA. In addition, a waiver should not be granted simply because the waiver could allow the parties to execute the contract at an earlier date than if TINA was applied.

Special Issue for Waivers (FAR 15.403-1(c)(4)). For all other exceptions to certified cost or pricing data requirements, granting the exception to a prime contractor or higher-tier subcontractor means that lower-tier subcontractors are also excepted from submitting certified cost or pricing data. Under the waiver of certified cost or pricing data requirements, the contractor or higher-tier subcontractor to whom the waiver applies must be considered as having been required to submit certified cost or pricing data. Consequently, lower-tier subcontract actions that are expected to exceed the certified cost or pricing data threshold require the submission of certified cost or pricing data unless:

- An exception otherwise applies to the lower-tier subcontract; or
- The prime contract waiver specifically includes the subcontract and the rationale supporting the waiver for that subcontract.

3.3 Data Other Than Certified Cost or Pricing Data

Policy on Requiring Data Other Than Certified Cost or Pricing Data (FAR 15.403-3). The contracting officer is responsible for obtaining data other than certified cost or pricing data to the extent necessary to determine price reasonableness or cost realism. See the definition of “data other than certified cost or pricing data” at FAR 2.101, and in section 3.0 above.

- When certified cost or pricing data are required, contractors are required to use the format in FAR 15.408, Table 15-2.
- When the pricing action is not subject to TINA and the contracting officer has no other means for determining price reasonableness, data other than certified cost or pricing data may be required. The contracting officer must determine the amount and format of additional data that will be needed in order to determine price reasonableness. To the maximum extent practicable, limit the requirement to data in a form regularly maintained by the offeror in commercial operations.
- Read the referenced definition of data other than certified cost or pricing data carefully. Although we want to limit requests for data to only that which is necessary to determine fair and reasonable prices, there is virtually no limit on the type of data the contracting officer can require. The type of data that may be required include: prior sales; catalog pricing and discounts; limited cost data such as: hours by labor category and direct and indirect rates, or possibly full cost data where absolutely necessary. Because the pricing action is exempt from TINA, the contractor would not be required to sign a certificate of current cost or pricing data.
- The key differences between “certified cost or pricing data” and “data other than certified cost or pricing data” is that “certified cost or pricing data” requires the contractor to also submit a Certificate of Current Cost or Pricing Data and requires the use of Table 15.2 (FAR 15.408). On the other hand, “data other than certified cost or pricing data,” although it could be made up of the same data, does not require a Certificate of Current Cost or Pricing Data and does not require submission of data in the format at Table 15.2. Also, while under TINA requirements the
Offeror/contractor is required to disclose all facts that a prudent buyer or seller would expect to have a significant impact on price, under "data other than certified cost or pricing data" the contracting officer may only require limited cost information from the offeror/contractor.

- Generally, you should not require firms to submit data other than certified cost or pricing data when there is adequate price competition.
  - If you need additional information to determine price reasonableness, to the maximum extent practicable, the contracting officer must obtain the necessary information from sources other than the offeror.
  - However, the contracting officer may require data other than certified cost or pricing data to determine the cost realism of competing offers or to evaluate competing approaches.
- Unless price reasonableness will be determined by adequate price competition or a price set by law or regulation, obtain (as a minimum) appropriate information on prices at which the same item or similar items have previously been sold that is adequate for determining price reasonableness.
- For commercial items:
  - Limit requests for sales information to data for the same or similar items during a relevant time period. **When using sales information for similar items, the contracting officer may also request cost information to help determine the impact, on price, of the differences between the item being procured and the similar item being used for comparison.**
  - To the maximum extent practicable, limit the requirement to information in a form regularly maintained by the offeror in commercial operations.
- As specified in FAR 15.403-3(a)(4) (Section 808 of Public Law 105-261), an offeror who does not comply with a requirement to submit data that the contracting officer has deemed necessary to determine price reasonableness or cost realism is ineligible for award unless the Head of the Contracting Activity determines that it is in the best interest of the Government to make the award to that offeror, based on consideration of the following:
  - The effort made to obtain the data.
  - The need for the item or service.
  - Increased cost or significant harm to the Government if award is not made.
- Contractor refusals to submit requested information, and all actions taken by the contracting officer and at levels above the contracting officer to address those refusals, must be fully documented.

**Price Data Other Than Certified Cost or Pricing Data.** The contracting officer may require the offeror/contractor to provide price data under the requirements of "data other than certified cost or pricing data." Price data will be particularly important for commercial items purchased noncompetitively.

### Price Data Other Than Certified Cost or Pricing Data

<table>
<thead>
<tr>
<th>Information Element</th>
<th>Consider Requiring Offerors/Contractors To...</th>
<th>Related Analysis Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog pricing</td>
<td>Identify any relevant offeror commercial catalog, its date, catalog prices, and related discounts. Also require the offeror/contractor to explain any differences between the offered price, the established catalog price, and price of recent sales in quantities similar to the proposed quantities.</td>
<td>Does the firm have a commercial catalog price? How do the prices for recent commercial sales compare with the catalog price? How does the price offered compare to the catalog price and the circumstances of the commercial sales?</td>
</tr>
<tr>
<td>Market pricing</td>
<td>Describe the nature of the relevant market and how that market affects the offered price including the source and date or period of any relevant market quotation or other basis for market price, the base market price, and applicable discounts or other price.</td>
<td>Is there a commercial market for the item? Is there an independent and verifiable record of the market price? How does the price offered</td>
</tr>
</tbody>
</table>
**Cost Data Other Than Certified Cost or Pricing Data.** You may require an offeror/contractor to provide cost data under the requirements of "data other than certified cost or pricing data" to support your analysis of price reasonableness or cost realism. The table below examines situations in which additional cost data under "data other than certified cost or pricing data" might be needed. Examples of the type of questions that cost data could help answer are also provided. Government technical, field pricing, and audit assistance may be required to analyze the cost information and answer related questions.

<table>
<thead>
<tr>
<th>Contracting Situation</th>
<th>Analysis Purpose</th>
<th>Analysis Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other evidence of prices charged</strong></td>
<td>Provide evidence of prices charged other customers under similar circumstances. For example, the firm could provide copies of contracts with other customers to document the prices charged.</td>
<td>Can the offeror provide evidence of the prices paid by commercial customers? Do commercial customers verify the prices paid? How does the price offered compare with the prices paid by other customers under similar circumstances?</td>
</tr>
<tr>
<td><strong>Services normally provided</strong></td>
<td>Describe the services provided by the offeror/contract to the firm's buying at the prices provided as bases for price analysis. Different firms and industries provide different levels of support services for their products, including product warranties, set-up, and financing.</td>
<td>What services are provided other customers? Based on services provided, should the Government price be different than the price charged commercial customers?</td>
</tr>
<tr>
<td><strong>Normal order size</strong></td>
<td>Document the normal order size for firms paying prices provided by the offeror/contractor as bases for price analysis. Prices may relate to the total size of each order, not just the price of the item involved. For example, an order could include 100 units of the item and nothing else, or the order could include 100 units of the item and thousands of units of other items. Presumably, the larger order should merit a lower price.</td>
<td>What was the total dollar value of orders with other customers? Based on the relative order size, should the Government price be different than the price charged other customers?</td>
</tr>
<tr>
<td><strong>Annual Volume of Sales to Similar Customers</strong></td>
<td>Document the sales volume to similar customers and the prices paid by those customers. For example, commercial firms often negotiate total volume discounts with major customers, over and above normal order quantity discounts. In comparing total volume of purchases, you should normally consider known acquisitions from all Government activities as a group.</td>
<td>Under similar circumstances, does the firm sell at lower prices to firms with larger total annual purchases? What prices are charged other customers with total annual purchases similar to that of the Government?</td>
</tr>
<tr>
<td><strong>Lowest Price Charged Other Customers</strong></td>
<td>Document the lowest prices recently charged other customers for the same or similar products. The Government procurement may not this most favored customer treatment, however this information will provide useful information on the lowest prices paid by any customer under any circumstances. What is recent will vary based on the type of item and the market. Generally, it will vary from three months to a year.</td>
<td>What is the lowest recent price paid for the same or similar product? How do the circumstances of the Government procurement differ from the circumstances of the lowest priced sale?</td>
</tr>
</tbody>
</table>
Information Requirement (FAR 15.403-3(a), FAR 15.408(l), FAR 15.408(m), FAR 52.215-20, and FAR 52.215-21).

The solicitation/contract must specify the data and the format required:

- Tailor the requirement to the data essential for your analysis (e.g., do not require cost data if price data is adequate).
- Permit the firm to select the format for submitting the data unless the contracting officer determines that use of a specific format is essential.
- Ensure that the data used to support price negotiations is sufficiently current to permit negotiation of a fair and reasonable price.
- Limit requests for updated offeror/contractor data to data that affects the adequacy of the proposal for negotiations (e.g., changes in price lists).
- Never require a certificate of current cost or pricing data for any data other than certified cost or pricing data.
4.0 Chapter Introduction

Criteria Development Process. The figure below depicts the sequence of events or steps that you should follow in developing contract award criteria for contract pricing.

Identify Most Advantageous Award Strategy. As you prepare any solicitation, you must clearly define the groupings and possible award combinations that will be considered in evaluating offers for contract award. When you solicit offers to provide one unit of a single product, only one firm can receive a contract award to provide that unit. However, as the number of different items and the number of units of each item increase, the number of award possibilities also increases. Theoretically, the award possibilities could become almost infinite.
There is no one method of grouping items for contract award that will always result in effective competition and reasonable prices. However, each method described in this chapter can improve competition and lower prices when used in the appropriate acquisition situation. As you decide which method to use in a particular acquisition situation, consider both the product that you are acquiring and the potential offerors. Use market research to learn about the customary practices used by Government and industry.

### 4.1 Aggregate Award Of All Line Items To One Contractor

**Aggregate Awards**. The table below presents descriptions and pricing considerations for making aggregate awards.

<table>
<thead>
<tr>
<th>Description</th>
<th>Use When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award to the single responsible offeror whose offer provides the best value to the Government.</td>
<td>Award on an &quot;all or none&quot; basis would probably result in a total price that is lower than the sum of low offers from a line-item by line-item competition. This method would be especially appropriate when firms regularly sell the contract items as an integrated package to realize economies of scale that are not possible when selling each component independently. <strong>For example:</strong> Many firms offer computer systems that are cheaper than buying the separate components (e.g. disk drives, monitors, printers, etc.) one by one.</td>
</tr>
</tbody>
</table>

**Example of a Method of Award Provision:**
Award will be made in the aggregate for all items. The low aggregate offeror will be determined by multiplying the unit price submitted on each item by the quantity specified, and adding the resultant extensions. In order to qualify for an award, prices must be submitted on all items.

### 4.2 Multiple Awards For Different Line Items

**Multiple Awards for Different Line Items** ([FAR 52.214-22](https://www.acq.osd.mil/far/far2015.html#appd) and [FAR 52.215-1(f)(6)](https://www.acq.osd.mil/far/far2015.html#appd)). The table below presents descriptions and pricing considerations for making multiple awards for different line items.

<table>
<thead>
<tr>
<th>Description</th>
<th>Use When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base award(s) on the line items or groups of line items that provide the lowest aggregate cost to the Government, including the assumed administrative costs for awarding and administering each contract.</td>
<td>Awarding line item by line item is likely to result in a lower total price than awarding on an aggregate &quot;all or none&quot; basis. This method would be especially appropriate if prospective offerors are likely to perceive no significant economies of scale from an aggregate award. <strong>For example:</strong> Some firms may sell computer peripherals at much lower prices than are typically offered by computer manufacturers. However, such firms might not be able to compete to provide the peripherals if the solicitation requires award based on the aggregate price for all line items (including the peripherals) that comprise a microcomputer system.</td>
</tr>
</tbody>
</table>

**Example 1 of a Method of Award Provision:**
The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.
**Example 2 of a Method of Award Provision:**
In addition to other factors, bids will be evaluated on the basis of advantages and disadvantages to the Government that might result from making more than one award (multiple awards). It is assumed, for the purpose of evaluating bids, that $500 would be the administrative cost to the Government for issuing and administering each contract awarded under this solicitation, and individual awards will be for the items or combinations of items that result in the lowest aggregate cost to the Government, including the assumed administrative cost.

### 4.3 Family Or Group Buys
*Family or Group Buys ([FAR 52.214-22](https://www.acquisition.gov/far/52.214-22) and [FAR 52.215-1(f)(6)](https://www.acquisition.gov/far/52.215-1(f)(6))).* The table below presents descriptions and pricing considerations for family or group buys.

<table>
<thead>
<tr>
<th>Description</th>
<th>Use When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award for identified families, or groups, of line items that provide the lowest aggregate cost to the Government, including the assumed administrative costs of awarding each contract.</td>
<td>Offerors are likely to submit a total price for a group of line items that would be lower than the sum of their offers on the individual items. This method would be especially appropriate if offerors are likely to perceive significant economies of scale from being awarded all line items in a particular group as a package. <em>For example:</em> Firms that manufacture ink cartridges for printers also tend to manufacture ink cartridges for fax machines. Line items for different ink cartridges might be included in a single family of items.</td>
</tr>
</tbody>
</table>

**Example of a Method of Award Provision:**
Award will be made in the aggregate for each identified group of items. The low offeror for the group will be determined by multiplying the unit price submitted on each item in the group by the estimated quantity specified, and adding the resultant extensions. In order to qualify for an award on a group of items, an offeror must submit prices for each item within the group.

### 4.4 Progressive Awards For Portions Of Total Line Item Requirement
*Progressive Awards.* The table below presents descriptions and pricing considerations for making progressive awards.

<table>
<thead>
<tr>
<th>Description</th>
<th>Use When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the offeror with lowest evaluated unit price for a line item offers less than the total quantity required by the Government, award up to the quantity offered. Follow the same procedure with the next lowest evaluated unit price and continue until the entire line item requirement is awarded.</td>
<td>Some of the potential competitors do not have the capability to supply the entire quantity required by the Government, but might be in a position to offer the lowest price for some of the needed units. <em>For example:</em> Some firms specialize in reconditioning laser printer cartridges and offer those cartridges at a fraction of the price of new units. If such a firm did not have enough reconditioned cartridges to fill the entire requirement, a progressive award would allow the firm to compete for the quantities that it can supply -- with other firms competing for the balance of the requirement.</td>
</tr>
</tbody>
</table>

**Example of a Method of Award Provision:**
a) Award will be made on an item-by-item basis to the lowest responsive offerors up to their stated...
monthly quantity allocations. Awards to any offeror will not be made for quantities in excess of the firm's stated monthly quantity allocation.
b) If the low responsive offeror offers a monthly quantity allocation which, when multiplied by the number of months representing the contract period, totals less than the Government's estimated annual requirements, the Government may make progressive awards to the extent necessary to meet its estimated annual requirements. In such cases, awards will be made to the low responsive offeror up to that offeror's stated monthly quantity allocation, and then progressively to other offerors to the extent necessary to cover all Government requirements. Within the limits prescribed by the offeror, the Government will apply offeror's monthly quantity allocation to any items offered, as the Government's interests require.
c) If progressive awards are made, orders will be placed first with the contractor offering the lowest price on each item normally up to the contractor's monthly quantity allocation and then in the same manner, successively to other contractors. However, to avoid the placement of unduly small orders or the splitting of a single requirement between two contractors, the Government reserves the right to place orders with back-up contractors whenever the orders placed with lower priced contractors equal or exceeds 95 percent of their monthly quantity allocation for the item or group of items being ordered. In no case will orders be placed with any contractor in excess of its monthly quantity allocation.

4.5 Multiple Awards For The Same Line Item

Multiple Awards for the Same Line Item (FAR 16.504(c)). The table below presents descriptions and pricing considerations for making multiple awards for the same line item under an indefinite quantity contract.

<table>
<thead>
<tr>
<th>Description</th>
<th>Use When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make multiple awards for the same indefinite requirement in situations where multiple firms are capable of delivering similar, but not necessarily identical, products to meet the needs of the Government and provide alternatives for ordering offices. Ordering offices then have the choice of selecting the product and firm that best meet their needs.</td>
<td>Appropriate to meet the needs of the Government. If you are using an indefinite quantity contract for:</td>
</tr>
<tr>
<td></td>
<td>● Supplies or services other than advisory and assistance services, give preference to making multiple awards, unless you determine that a single award is appropriate.</td>
</tr>
<tr>
<td></td>
<td>● Advisory and assistance services that will not exceed three years and $10 million, including all options, you may give preference to making multiple awards.</td>
</tr>
<tr>
<td></td>
<td>● Advisory and assistance services that will exceed three years and $10 million, you must give preference to making multiple awards, unless:</td>
</tr>
<tr>
<td></td>
<td>● The contracting officer, or other person designated by the agency head, determines in writing prior to solicitation that the services are so unique or highly specialized that it is not practical to award more than one contract. This determination may also be appropriate when contract tasks are so integrally related that only a single contractor can reasonably perform the work, or</td>
</tr>
<tr>
<td></td>
<td>● The contracting officer, or other person designated by the agency head, determines in writing, after evaluation of offers, that only one offeror is capable of</td>
</tr>
</tbody>
</table>
providing the services required, or

- You only receive one offer.

**Example 1 of a Method of Award Provision:**
The Government may elect to award a single delivery order contract or task order contract or to award multiple delivery order contracts or task order contracts for the same or similar supplies or services to two or more sources under this solicitation.

**Example 2 of a Method of Award Provision:**
The Government intends to award multiple contracts for the same or similar advisory and assistance services under this solicitation unless the Government determines, after evaluation of offers, that only one offeror is capable of providing the services at the level of quality required.

### 4.6 Split Awards

*Split Awards (FAR 6.202).* The table below presents descriptions and pricing considerations for making split awards.

<table>
<thead>
<tr>
<th>Description</th>
<th>Use When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award of requirements for an individual line item may be split between two or more sources. The size of each portion of the split or a method for calculating the split should be established in the solicitation. Every possible effort should be made to assure that any amount awarded is an economic production quantity.</td>
<td>- Multiple sourcing is necessary to maintain competitive sources for a product that would otherwise be available only from one source. The split may be on a percentage share basis, with the most favorable offer receiving the largest percentage of the requirement; or - Multiple source development will be facilitated at relatively low risk to the Government. For example, a partial set-aside is a form of split award.</td>
</tr>
</tbody>
</table>

**Example of Method of Award Provision:**
The Government intends to make split awards from this solicitation. Sixty percent of the total quantity will be awarded to the offeror that the Government determines to have submitted the proposal that offers the best value to the Government, considering primarily technical scores and secondarily, offered prices. Forty percent will be awarded to the remaining competitor provided that the technical evaluation determines that the technical proposal is acceptable and the offered prices are determined to be fair and reasonable.

### 4.7 Partial Set-Aside Awards

*Partial Set-Aside Awards (FAR 19.502-3 and FAR 52.219-7).* The table below presents descriptions and pricing considerations for making partial set-aside awards.

<table>
<thead>
<tr>
<th>Description</th>
<th>Use When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>A portion of the solicitation requirement is set-aside for small business. Any small business can submit an offer to provide the set-aside portion, the non-set-aside portion, or both. Note: If a small business is awarded the non-set-aside portion of the requirement, do not attempt to negotiate a lower price with the firm for the set-aside portion. However, accept voluntary reductions.</td>
<td>- A total set-aside is not appropriate. - The requirement is severable into two or more economic purchase lots. - One or more small business concerns is expected to have the technical competence and productive capacity to satisfy the set-aside portion of the requirement at a fair market price. - The acquisition is not made under</td>
</tr>
</tbody>
</table>
small purchase procedures. Unless authorized by the head of the contracting activity, do not use a partial set-aside if there is a reasonable expectation that only two capable concerns (one large and one small) will respond.

**Method of Award Provision Requirements:**
The set-aside portion of the requirements must be specifically identified. Any acceptable method of award may be used to award the set-aside portion, including aggregate, line item by line item, or family buys. Solicitations must include FAR 52.219-7, Notice of Partial Small Business Set-Aside.

- 5.0 - **Chapter Introduction**
- 5.1 - **Assumed Administrative Cost Factors in Sealed Bids**
- 5.2 - **Buy American Act Criteria**
  - 5.2.1 **FAR Criteria**
  - 5.2.2 **DFARS Criteria**
- 5.3 - **Government Furnished Production And Research Property Factors**
  - 5.3.1 **Competitive Advantage**
  - 5.3.2 **Consider Costs And Savings To The Government**
- 5.4 - **Transportation Costs**
- 5.5 - **Options And Multiyear Contracting**
  - 5.5.1 **Options**
  - 5.5.2 **Multi-Year Contracting**
- 5.6 - **Life-Cycle Costs**
- 5.7 - **Energy Conservation And Efficiency Factors**
- 5.8 - **Lease Vs. Purchase Factors**
- 5.9 - **Small Disadvantaged Business Price Evaluation Adjustment**
- 5.10 - **HUBZone Price Evaluation Preference**

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**5.0 Chapter Introduction**

*Procedural Steps.* The figure below shows where this chapter fits into the conduct of a price analysis.

**Steps in Analyzing Prices (Chapters 5-7)**
Identify Price-Related Factors (FAR 14.201-5(c) and FAR 15.204-5(e)). As you prepare any solicitation, you must identify the price-related factors to be considered in the contract award decision. **Assure that contract award criteria address all price-related factors that will have a significant and quantifiable effect on the total cost of the acquisition.** The price-related factors identified in this chapter are not meant to provide an exhaustive list of price-related factors that you could consider during offer evaluation. However, the chapter does address several key price-related factors that may be applicable to your contracting situation.

If you identify other price-related factors that may affect the total cost of a particular acquisition, you should consider those factors as you develop your contract award criteria.

*Use Price-Related Factors (FAR 14.201-6(q) and FAR 52.215-1(f)(6)).* Once you identify price-related criteria for offer evaluation, you must consider those criteria in offer evaluation. Generally, your evaluation should follow this 4-step procedure:

1. **Determine solicitation provisions.**
2. **Determine total price offered.**
3. **Evaluate award combinations.**
4. **Make award decision.**

**5.1 Assumed Administrative Cost Factors In Sealed Bids**

*When to Consider Administrative Cost Factors.* When multiple award of different line items in the solicitation is possible, you must consider the effect of different award combinations on the total cost to the Government. Since it will cost more to administer each additional contract, you must consider that cost in your evaluation.
General Evaluation Requirements (FAR 14.201-6(q), FAR 52.214-22, and FAR 52.215-1(f)(6)).

In sealed bidding, if the contracting officer determines that making multiple awards might be economically advantageous to the Government, you must consider the costs of making multiple awards in offer evaluation. FAR prescribes an assumed administrative cost of $500 for issuing and administering each contract (FAR 14.201-8(c)).

When using negotiation procedures, other contract objectives may preclude consideration of the cost of multiple awards (e.g., multiple awards are preferred for most indefinite-quantity indefinite-delivery contracts). If consideration is appropriate, you could use the same $500 cost estimate or a different reasonable estimate supported by a documented rationale.

Step 2. Determine Offered Price(s).
Determine the price(s) in each offer for each item or group of items being considered for contract award.

Step 3. Evaluate Possible Award Combinations.
In your evaluation of offers, consider the estimated administrative cost for each contract (e.g., $500) when evaluating the possible award combinations. In relatively simple award situations, you might be able to determine the proper award decision without detailed calculations. In most situations, however, you must evaluate all possible award combinations. If the number of offerors is so large that evaluation of all possible methods of award would be prohibitive, you may exclude offerors that obviously have no chance of receiving the award. When determining which offerors do have a chance of receiving an award, consider the following:

- A successful offeror will NORMALLY be low on one or more items.
- If there are many offerors who are low on different items, it MAY BE POSSIBLE for a firm with offers close to the low offer on many items to win an award when the cost of contract administration value is considered.

Step 4. Make Award Decision.
Select the responsible bidder whose bid, conforming to the invitation, will be most advantageous to the Government, considering only price and the price-related factors (see FAR 14.201-8 and FAR 14.408-1).

Evaluation Example (FAR 52.214-22).

As an example of the evaluation process, consider an award under sealed bidding procedures. Assume that the invitation for bids states that award will be made to the responsive and responsible bidder with the lowest evaluated price and includes the following clause:

EVALUATION OF BIDS FOR MULTIPLE AWARDS (MAR 1990)

In addition to other factors, bids will be evaluated on the basis of advantages and disadvantages to the Government that might result from making more than one award (multiple awards). It is assumed, for the purposes of evaluating bids, that $500 would be the administrative cost to the Government for issuing and administering each contract awarded under this solicitation, and individual awards will be for the items or combinations of items that result in the lowest aggregate cost to the Government, including the assumed administrative costs.

Step 2. Determine Offered Price(s).
In your evaluation of bids, consider the possible award combinations. Bids on the three different line items in the solicitation were received from two bidders. The extended line item totals, unit price multiplied by quantity, are shown in the table below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Bid 1</th>
<th>Bid 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$74,000</td>
<td>$74,450</td>
</tr>
<tr>
<td>2</td>
<td>$94,750</td>
<td>$94,250</td>
</tr>
<tr>
<td>3</td>
<td>$22,125</td>
<td>$21,500</td>
</tr>
</tbody>
</table>

Step 3. Evaluate Possible Award Combinations.
Given the evaluation criteria and the bids, there are three possible methods of contract award:

- Multiple Awards
- Award All Items to Bidder 1
- Award All Items to Bidder 2
Multiple Awards. Awards to both Bidders 1 and 2. Looking at the bids without considering the $500 evaluation factor, making multiple awards appears to be the logical decision. Following this procedure, the total evaluated price would be:

<table>
<thead>
<tr>
<th>Item</th>
<th>Bidder 1 Award</th>
<th>Bidder 2 Award</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$74,000</td>
<td></td>
<td>$ 74,000</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>$ 94,250</td>
<td>$ 94,250</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>$ 21,500</td>
<td>$ 21,500</td>
</tr>
<tr>
<td>Admin. Cost</td>
<td>$ 500</td>
<td>$ 500</td>
<td>$ 1,000</td>
</tr>
<tr>
<td>Evaluation Price</td>
<td>$74,500</td>
<td>$116,250</td>
<td>$190,750</td>
</tr>
</tbody>
</table>

Award All Items to Bidder 1. If all items were awarded to Bidder 1, the total evaluated price would be:

<table>
<thead>
<tr>
<th>Item</th>
<th>Bidder 1 Award</th>
<th>Bidder 2 Award</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$74,000</td>
<td></td>
<td>$ 74,000</td>
</tr>
<tr>
<td>2</td>
<td>$ 94,750</td>
<td>$ 94,750</td>
<td>$191,375</td>
</tr>
<tr>
<td>3</td>
<td>$ 22,125</td>
<td>$ 22,125</td>
<td>$190,700</td>
</tr>
<tr>
<td>Admin. Cost</td>
<td>$ 500</td>
<td></td>
<td>$ 500</td>
</tr>
<tr>
<td>Evaluation Price</td>
<td>$191,375</td>
<td>$191,375</td>
<td>$191,375</td>
</tr>
</tbody>
</table>

Award All Items to Bidder 2. If all items were awarded to Bidder 2, the total evaluated price would be:

<table>
<thead>
<tr>
<th>Item</th>
<th>Bidder 1 Award</th>
<th>Bidder 2 Award</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>$ 74,450</td>
<td>$ 74,450</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>$ 94,250</td>
<td>$ 94,250</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>$ 21,500</td>
<td>$ 21,500</td>
</tr>
<tr>
<td>Admin. Cost</td>
<td>$ 500</td>
<td></td>
<td>$ 500</td>
</tr>
<tr>
<td>Evaluation Price</td>
<td>$190,700</td>
<td>$190,700</td>
<td>$190,700</td>
</tr>
</tbody>
</table>

Step 4. Make Award Decision.
In this case, your decision should be to award the entire requirement to Bidder 2, because that decision would result in the lowest aggregate evaluated price to the Government. Although multiple awards appears to offer the lowest total contract price, you can see that, when the assumed administrative cost was factored in, the total evaluated price is lowest if all items are awarded to Bidder 2.

5.2 Buy American Act Criteria
In This Section. The Independent Government Estimate is only one preliminary estimate of contract price. As a minimum, your research, should consider the data sources identified in this section.

- 5.2.1 FAR Criteria
- 5.2.2 DFARS Criteria

Buy American Act Requirement (FAR 25.101 and DFARS 225.101). The Buy American Act requires that only domestic end products be acquired for public use, except articles, materials, and supplies-

- For use outside the United States;
- For which the agency head determines that domestic preference would be inconsistent with the public interest;
- That are not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities, of a satisfactory quality; or
- For which the cost would be unreasonable, as determined in accordance with FAR or
agency guidance;
- Purchased specifically for commissary resale.
- For the acquisition of information technology that is a commercial item, when using fiscal year 2004 or subsequent fiscal year funds.

5.2.1 FAR Criteria

Applicability of FAR Guidance. FAR 25.1 Provides the overview, policy and exceptions of the Buy America Act. Key terms are defined at FAR 25.003.
- To implement Buy American Act requirements, insert FAR Buy American Act--Supplies clause, FAR 52.225-1, as well as the FAR Buy American Certificate, FAR 52.225-2, into any solicitation for supplies, or for services involving the furnishing of supplies, within the United States, unless the solicitation is restricted to domestic end products, the acquisition is made under the European Community Agreement or Trade Agreements Act, or another exception to the Buy American Act applies. This clause requires the contractor to deliver only domestic end products, unless one of the FAR 25.103 exceptions apply.

Distinguishing Domestic from Nondomestic End Products (FAR 52.225-2). The FAR Buy American Certificate requires each offeror to identify any product being offered that is not a known domestic end product.

Determining reasonableness of costs: See FAR 25.105.

Evaluating foreign offers: See FAR 25.5.


Decide whether to consider the FAR Buy American Act criteria in offer evaluation.
- Determine whether the FAR Buy American Act--Supplies clause was required for the acquisition and incorporated in the solicitation.
- If the clause was required you must examine the American Certificate submitted by each offeror to determine if any firm is offering a foreign product. If any offeror lists an Excluded End Product on the Certificate, the Buy American Act criteria would apply unless:
  - The country of origin or the product is covered by one of the many exceptions to application of those criteria, or
  - No competing firm has offered a domestic product (i.e., an "unexcluded" end product) in response to your solicitation.

Step 2. Determine Offered Price(s).

Identify the price(s) in each offer for each item or group of items being considered for contract award. Identify the duty applicable to each foreign offer.

Step 3. Evaluate Possible Award Combinations.

Evaluate each item or group of items for which award may be made in accordance with solicitation contract award criteria. Use the criteria at FAR 25.105 to determine price reasonableness.

Step 4. Make Award Decision.

Award to the offeror with the offer that provides the best value for the Government under the criteria established in the solicitation. Settle ties in favor of domestic offers.

Evaluation Example.


Assume that a solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price. The Buy American Act applies to the acquisition, with no applicable exception to the Act for the acquisition or the end product. Examining the Buy American Certificate in each offer, you discover that Offeror 2 and Offeror 3 left their respective certificates blank, meaning (presumably) that they are offering domestic end items. Offeror 1 states that the country of origin for its product is Greater Aquatica. Since no exception applies to products from Aquatica, you must apply the FAR Buy American Act criteria.

Step 2. Determine Offered Price(s).

The table below lists the evaluated price of each offer. The price for the foreign end product includes all applicable duties.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>End Product</th>
<th>Price</th>
<th>Duty Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offeror 1</td>
<td>Greater Aquatica</td>
<td>$500</td>
<td>Domestic</td>
</tr>
<tr>
<td>Offeror 2</td>
<td>Domestic</td>
<td>$400</td>
<td>Domestic</td>
</tr>
<tr>
<td>Offeror 3</td>
<td>Domestic</td>
<td>$450</td>
<td>Domestic</td>
</tr>
</tbody>
</table>

Step 2. Determine Offered Price(s).

Identify the price(s) in each offer for each item or group of items being considered for contract award. Identify the duty applicable to each foreign offer.
**Step 3. Evaluate Possible Award Combinations.**

All offers are technically acceptable. Offeror 2 is a large business and Offeror 3 is a small business. Since the foreign offer is low, you must use Buy American Act requirements to evaluate the low offer and the low domestic offer. Because the low domestic offeror is a large business, you must use the 6-percent factor to adjust Offer 1 as follows:

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
<th>Apply 6-Percent Factor</th>
<th>Evaluated Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$168,000</td>
<td>.06 x $168,000 = $10,080</td>
<td>$178,080</td>
</tr>
<tr>
<td>2</td>
<td>$179,000</td>
<td>N/A</td>
<td>$179,000</td>
</tr>
<tr>
<td>3</td>
<td>$180,000</td>
<td>N/A</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

*Item is not duty exempt. The price includes a $1,900 duty.

**Step 4. Make Award Decision.**

Based on the evaluation above, you should award to Offeror 1, the offeror with the low evaluated price. **Evaluation Example Note:** Offer 1 was not compared with Offer 3, because Offer 3 was not the low domestic offer. If Offeror 1 had been in competition ONLY with Offeror 3, Offer 3 would have won the competition, because the adjustment factor would have been 12 percent for a small business. Also, see examples at [FAR 25.504](https://www.federalregister.gov).
Decide whether to consider the FAR Buy American Act criteria in proposal evaluation.
- Determine if the Buy American Act and Balance of Payments Program clause was required for the acquisition and incorporated in the solicitation.
- If the clause was required, examine the Buy American Certificate-Balance of Payments Program Certificate submitted by each offeror to determine if any firm is offering a foreign product and if any firm identifies a nonqualifying country end product on the Certificate.

Step 2. Determine Offered Price(s).
Identify the price(s) in each offer for each item or group of items being considered for contract award. Identify the duty applicable to each foreign offer.

Step 3. Evaluate Possible Award Combinations.
If the Act applies to the acquisition, add 50 percent to the price of the lowest offer of a product from a nonqualifying country. Qualifying country offers are specifically excluded from application of the requirements of the Buy American Act because of the provisions of memoranda of understanding or other international agreements.
As you evaluate nonqualifying country offers, consider the following:
- When a nonqualifying country offer includes more than one item, apply the 50-percent factor:
  - On an item-by-item basis; or
  - On a group basis, if the solicitation specifically provides for award on a group basis.
- When application of the factor would not result in the award of a domestic end product (e.g. when no domestic offers are received or when a qualifying country offer is lower than the domestic offers) evaluate nonqualifying country offers without the 50-percent factor.
- If duty is to be exempted through the inclusion of the FAR Duty-Free Entry clause, you must still evaluate the nonqualifying country offer inclusive of duty. If award is made on the nonqualifying country offer, award at the offered price minus the duty.
- If the evaluation procedures result in a tie between a nonqualifying country offer and a domestic offer, make award on the domestic offer.
- If an offer is for a U.S. made end product, domestically produced end product, product of a small business, but is not a domestic end product, treat the offer as a nonqualifying country offer.

Step 4. Make Award Decision.
Award to the offeror with the lowest evaluated price, after application of the Buy American criteria in Step 3. Settle ties in favor of domestic offers.

Evaluation Example (DFARS 252.225-7000).

Assume that the solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price. The Buy American Act applies to this acquisition, with no applicable exception to the Act for the lens assembly or the end product.
You examine the Buy American--Balance of Payments Program Certificates submitted by Offeror 2 and Offeror 3 and find that they left their certificates blank, indicating that the items are domestic end products. Offeror 1 states that the country of origin for its product is Lower Aquatica (a nonqualifying country).

Step 2. Determine Offered Price(s).
The following table lists the evaluated price of each offer, after applying all other price-related factors in the RFP.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>End Product</th>
<th>Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nonqualifying</td>
<td>$168,000*</td>
</tr>
<tr>
<td>2</td>
<td>Domestic</td>
<td>$179,000</td>
</tr>
<tr>
<td>3</td>
<td>Domestic</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

* Item is not duty exempt. The price includes a $1,000 duty.

Step 3. Evaluate Possible Award Combinations.
You have investigated and found that the Buy American Act applies to this acquisition. Use the Buy American criteria to evaluate offers as follows:
Offeror | Offer  | Apply 50-Percent Factor | Evaluated Offer |
---|---|---|---|
1 | $168,000 | .50 x $168,000 = $84,000 | $252,000 |
2 | $179,000 | N/A | $179,000 |
3 | $180,000 | N/A | $180,000 |

**Step 4. Make Award Decision.**

Based on the evaluation above, you should select Offer (the low evaluated offer) for contract.

*Evaluation Example Note (DFARS 225.872-1).* Note that the decision would have been different if Offer 1 had been a product produced in a qualifying country, a country for which the DoD has determined it inconsistent with the public interest to apply the restrictions of the Buy American Act-Balance of Payment Program.

If Offer 1 had been a qualifying country offer, you would not apply the 50 percent adjustment factor. As a result, you would evaluate all offers without the adjustment factor:

| Offeror | Offer  | 50-Percent Factor | Evaluated Offer |
---|---|---|---|
1 | $168,000 | N/A | $168,000 |
2 | $179,000 | N/A | $179,000 |
3 | $180,000 | N/A | $180,000 |

Without the adjustment factor, you select Offeror 1 for contract award.

Also, see examples at DFARS/PGI 225.504.

### 5.3 Government Furnished Production And Research Property Factors

This section examines the factors that you must consider when soliciting and evaluating offers that may involve Government furnished production and research property:

- 5.3.1 - Eliminate Competitive Advantage
- 5.3.2 - Consider Costs And Savings To The Government

**Government Production and Research Property (FAR 45.301).** The term “Government production and research property” means Government-owned facilities, Government-owned special test equipment, and special tooling to which the Government has title or has the right to acquire title.

#### 5.3.1 Eliminate Competitive Advantage

*Factors in Offer Evaluation (FAR 45.201).* When evaluating offers, you must make the maximum practical effort to:

- Eliminate any competitive advantage accruing to a contractor possessing Government furnished production and research property.
- Consider any costs or savings to the Government related to providing such property, regardless of any competitive advantage that may result.

*When to Consider as a Price-Related Factor (FAR 45.201 and FAR 52.245-9).* To eliminate the competitive advantage that may result when an offeror offers to perform a contract with Government furnished production and research property, you can:

- **Adjust the offers of contractors proposing to use Government furnished production and research property.**
  - This is the **preferred method** for eliminating the competitive advantage. During offer evaluation, adjust any offers proposing the use of furnished production and research property using a factor equal to the rent that would be charged for use of the property under the requirements of the FAR Use and Charges clause. Only use the adjusted price in your evaluation. Do not include the adjustment in the price of any resulting contract award.
Do not adjust proposals using a rental equivalent factor when the contracting officer determines that using the factor would not affect the choice of contractor.

- Charge the contractor rent for using Government furnished production and research property. Only charge contractors rent when adjustment of offers for offer evaluation is not practical. Any offeror or subcontractor may use Government furnished production and research property after obtaining the written approval of the cognizant contracting officer. Charge rent in accordance with the provisions of the FAR Use and Charges clause.

**Solicitation Requirements (FAR 45.201).** When you anticipate that Government production and research property will be offered for use in a competitive acquisition, the solicitation:

- Should normally require the contractor to assume all costs related to making the property available for use (such as payment of all transportation or rehabilitation costs).
- The solicitation must describe offer evaluation procedures, including rental charges or equivalents to be evaluated, and require all offerors to submit with their offers the following information:
  - A list or description of all Government production and research property that the offeror or its subcontractors propose to use on a rent-free basis. The list must include property offered for use in the solicitation, as well as property already in possession of the offeror and its subcontractors under other contracts.
  - Identification of the facilities contract or other instrument under which property already in possession of the offeror and its subcontractors is held and written permission for its use from the cognizant contracting officer.
  - The dates during which the property will be available for use (including the first, last, and all intervening months) and, for any property that will be used concurrently in performing two or more contracts, the amounts of the respective uses in sufficient detail to support proration of the rent.
  - The amount of rent that would otherwise be charged, computed in accordance with FAR requirements.
- The solicitation must provide that using Government production and research property (other than as described and permitted in the solicitation) will not be authorized under the contract unless such use is approved in writing by the contracting officer with property cognizance, and either rent (calculated in accordance with the FAR Use and Charges clause) is charged, or the contract price is reduced by an equivalent amount.

**General Evaluation Requirements (FAR 45.201).**

**Step 1. Determine Solicitation Provisions.**
The solicitation must describe the evaluation procedures to be used, including the rental charges or equivalents to be evaluated, and information the offeror must submit with its offer.

**Step 2. Determine Offered Price(s).**

**Step 3. Evaluate Possible Award Combinations.**
Before you evaluate the pricing aspects of contractor use of Government production and research property on the contract, contact the contracting officer with property cognizance to confirm that the property is available for use on the contract. Follow the offer evaluation procedures set forth in the solicitation.

**Step 4. Make Award Decision.**
Whichever method you use, select the offer that provides the best value for the Government under the criteria established in the solicitation.

Determine the price(s) in each offer for each item or group of items being considered for contract award. Also identify what property each offeror is proposing to use on the contract and the estimated period of use.

**Evaluation Example (FAR 45.201 and FAR 52.245-9).**

**Step 1. Determine Solicitation Provisions.**
Assume that the solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price. It also includes the following provision:

For purposes of offer evaluation, any offer predicated on rent-free use of Government production and research property will be adjusted to eliminate possible competitive advantage. The adjustment will be made using a rental equipment adjustment factor equal to the allocable rent that would otherwise be
chased for use of the Government property. Rent will be computed in accordance with FAR 52.245-9, Use and Charges.

**Step 2. Determine Offered Price(s).**

Two offers were received in response to the solicitation.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$352,000</td>
</tr>
<tr>
<td>2</td>
<td>$347,000</td>
</tr>
</tbody>
</table>

Only Offer 2 proposes rent-free use of GFP. It proposes rent-free use of one APEX Model 5209, Serial #14345089, machine tool, for a period of one month during production.

**Step 3. Evaluate Possible Award Combinations**

Contact the contracting officer responsible for the GFP to ensure that the proposed GFP will be available for use on your contract, as requested by the offeror.

Assume that the contracting officer with property cognizance further advises you that it is less than two years old and cost $200,000. Using the FAR Use and Charges clause, you determine that a fair and reasonable rental cost is $6,000.

Using the $6,000 in evaluation, you find:

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
<th>GFP Rental Equivalent</th>
<th>Evaluated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$352,000</td>
<td>N/A</td>
<td>$352,000</td>
</tr>
<tr>
<td>2</td>
<td>$347,000</td>
<td>$6,000</td>
<td>$353,000</td>
</tr>
</tbody>
</table>

**Step 4. Make Award Decision.**

Based on the evaluation above, you should award to Offeror 1. This will result in the lowest evaluated price to the Government.

---

**5.3.2 Consider Costs And Savings To The Government**

*When to Consider as a Price-Related Factor (FAR 45.201).* When evaluating offers, consider any other costs or savings to the Government that will result from providing production or research property, regardless of any competitive advantage that may result.

**Solicitation Requirements Related to Costs (FAR 45.202 and FAR 45.201).** The solicitation:

- Should normally require the contractor to assume all costs related to making the property available for use (such as payment of all transportation or rehabilitation costs).
- Must describe these costs or savings will be considered in offer evaluation.
- Must specify any costs to the Government related to furnishing Government production and research property either as dollar amounts or as formulas.
  - Limit consideration to the cost of:
  - Reactivation from storage;
  - Rehabilitation and conversion; and
  - Making the property available on an f.o.b. basis.
  - If (under the terms of the solicitation) the contractor will bear the transportation cost of furnishing Government production and research property or the cost or making it suitable for use, do not use additional evaluation factors related to those costs.
- Specify the dollar amount of any savings to the Government related to contractor use of Government production and research property. Examples of such savings include any savings that result from avoiding the costs of deactivating tools and them in layaway, storage, or idle status.

*General Evaluation Requirements (FAR 45.202).*

**Step 1. Determine Solicitation Provisions.**
The solicitation must specify savings that will be considered in offer evaluation as dollar values. Costs must be stated using dollar values or formulas. Do not provide for any adjustment to consider costs that will be borne by the contractor.

**Step 2. Determine Offered Price(s).**
Determine the price(s) in each offer for each item or group of items being considered for contract award. Review each offer to determine whether it specifies use of the identified property.

**Step 3. Evaluate Possible Award Combinations.**
In offer evaluation, identify the costs and savings in each offer related to Government production and research property. Use the costs and savings specified in the solicitation.

**Step 4. Make Award Decision.**
Make award to the firm whose offer is most advantageous to the Government under the terms of the solicitation. Include consideration of the costs and savings to the Government that result from the use of the Government production and research property.

*Evaluation Example (FAR 45.202).*

**Step 1. Determine Solicitation Provisions.**
Assume that the solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price. It also includes the provision below. The amount of $9,000 represents the cost of deactivating and placing the tools in storage and maintaining them there for the period of the contract. A complete list of the tools involved is included elsewhere in solicitation. In addition to any other proposal adjustments, $9,000 will be deducted from any offers proposing to use the GFP identified in Solicitation Paragraph L-XX. The $9,000 represents the costs that the Government will avoid if the identified GFP is not placed in storage.

**Step 2. Determine Offered Price(s).**
You have received two offers. Both propose use of the tooling described in the solicitation. Offer 1 includes the estimated costs of relocating the tooling from the plant of Offeror 2. Offer 2 does not propose relocation costs because the tooling is already located at the offeror's plant.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
<th>Government Savings</th>
<th>Offer Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$36,000</td>
<td>$9,000</td>
<td>$355,000</td>
</tr>
<tr>
<td>2</td>
<td>$37,000</td>
<td>$9,000</td>
<td>$361,000</td>
</tr>
</tbody>
</table>

**Step 3. Evaluate Possible Award Combinations.**
Both offers propose use of the tooling described in the solicitation. As a result, the $9,000 savings identified in the solicitation will be deducted from the price offered by each of the offerors. No additional adjustment is required to consider the cost to the Government related to relocating the equipment. The relocation cost is included in Offer 1 and there is no relocation cost associated with Offer 2, because the property is already located at Offeror 2's facility.

**Step 4. Make Award Decision.**
In your evaluation, you should deduct $9,000 from both offers. As a result, there would be no change in the dollar difference between the two offers. You should award to Offeror 1.

### 5.4 Transportation Costs

*When to Consider as a Price-Related Factor (FAR 47.301, FAR 47.301-1, and FAR 47.301-2).* When transportation costs are not included in item purchase price, you must consider them as part of any supply contract award decision. Your objective is to ensure that acquisitions are made on the basis most
advantageous to the Government, and that supplies arrive in good order, in good condition, on time, at the required place.

Work with your agency transportation officer during solicitation and evaluation of offers to ensure that all necessary transportation factors are considered, including transportation costs.

F.o.b. Definition (FAR 2.101). The term free on board (f.o.b.) is used in conjunction with a physical point to determine:

- The responsibility and basis for payment of freight charges; and
- Unless otherwise agreed to, the point at which title for goods passes to the buyer or consignee.

For example: Contracts with "f.o.b. origin" generally require the Government to pick up the deliverable at the contractor's warehouse, with the Government responsible for shipping costs from the warehouse. In contrast, "f.o.b. destination" contracts generally requires the contractor -- at the contractor's expense -- to ship the contract item to a Government loading dock.

Usually, the f.o.b. point is either the place of shipment origin or final shipment destination but it can be anywhere in between. For example, the f.o.b. point could be an airport or dock where the shipment will be consolidated with other items for transport to a final destination.

Solicitation Requirements (FAR 47.304-1, FAR 47.303, FAR 47.305-1, FAR 52.247-45, FAR 52.247-46, FAR 52.247-47, FAR 52.247-49, FAR 52.247-50, and FAR 52.247-51). As you prepare each supply solicitation, the contracting officer must generally determine the contract f.o.b. terms on the basis of lowest overall cost. The solicitation must:

- describe how offers will be evaluated for contract award, such as:
  - F.o.b. Origin and/or F.o.b. Destination Evaluation;
  - Evaluation -- F.o.b. Origin;
  - Shipping Point(s) Used in Evaluation of F.o.b. Origin Offers;
  - Destination Unknown:
  - Evaluation of Export Offers; or
  - No Evaluation of Transportation Costs.

General Evaluation Requirements (FAR 47.304-1, FAR 47.304-1(a), FAR 47.304-1(b), and FAR 47.306).

The solicitation must specify the acceptable f.o.b. terms and the basis for offer evaluation.

- If the solicitation requires that all offerors be made f.o.b. destination, transportation must be included in the offered. No further consideration of transportation costs is required.
- When offers are quoted f.o.b. origin, consider the following factors along with purchase price when evaluating prices:
  - The cost of transportation from the offeror's designated point of origin to the destination defined in the solicitation. The Government normally uses land transportation rates in proposal evaluation.
  - When provided for in the solicitation, proposed cost-reimbursable differentials based on possible routing conditions. These contingencies may be included by offerors to compensate for an unfavorable routing condition. Evaluation is based on the routing conditions anticipated at the time of award.
- When offers may be quoted either f.o.b. origin or f.o.b. destination, your evaluation of:
  - F.o.b. destination offers will not require adjustment to consider the cost of transportation.
  - F.o.b. origin offers must consider the factors described above.

Step 2: Determine Offered Price(s).
Determine the price(s) in each offer for each item or group of items being considered for contract award. You must also examine each offer to identify the f.o.b. terms and to determine whether the offered terms comply with solicitation requirements.

Step 3. Evaluate Possible Award Combinations.
Evaluate offers using the specific criteria set forth in the solicitation. In evaluating transportation costs:

- You must use the lowest available freight rates and related accessorial and incidental charges that are:
  - In effect on, or become effective before, the expected date of initial shipment; and
  - On file or published on the date of bid opening or due date for offers.
If rates or related charges become available after the bid opening or the due date of offers, do not use them in evaluation unless they cover transportation for which no applicable rates were in effect at the time of bid opening or the due date of offers. (FAR 47.306-2)

**Evaluation Example (FAR 47.305-2, FAR 47.306-2, and FAR 52.247-45).**

**Step 1. Determine Solicitation Provisions.**

Assume that the solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price. It also includes the following provision:

Offers are invited on the basis of both f.o.b. origin and f.o.b. destination, and the Government will award on the basis the contracting officer determines to be most advantageous to the Government. An offer on the basis of f.o.b. origin only or f.o.b. destination only is acceptable, but will be evaluated only on the basis submitted.

**Step 2. Determine Offered Price(s).**

Three offers were received. One offers the item f.o.b. destination. The others offer the item f.o.b. origin.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>F.O.B. Point</th>
<th>Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Origin</td>
<td>$435,000</td>
</tr>
<tr>
<td>2</td>
<td>Destination</td>
<td>$450,000</td>
</tr>
<tr>
<td>3</td>
<td>Origin</td>
<td>$436,000</td>
</tr>
</tbody>
</table>

**Step 3. Evaluate Possible Award Combinations.**

From the cognizant transportation officer, you obtain information on the lowest available transportation cost and incidental charges. Specific shipping costs are shown below, for each offer:

<table>
<thead>
<tr>
<th>Offeror</th>
<th>F.O.B. Point</th>
<th>Offer</th>
<th>Transportation Cost</th>
<th>Evaluated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Origin</td>
<td>$435,000</td>
<td>$2,600</td>
<td>$437,600</td>
</tr>
<tr>
<td>2</td>
<td>Destination</td>
<td>$450,000</td>
<td>N/A</td>
<td>$450,000</td>
</tr>
<tr>
<td>3</td>
<td>Origin</td>
<td>$436,000</td>
<td>$1,500</td>
<td>$437,500</td>
</tr>
</tbody>
</table>

**Step 4. Make the Award.**

Make award to the offeror with the lowest evaluated price, Offeror 3.

---

### 5.5 Options And Multi-Year Contracting

This section examines the factors that you must consider when soliciting and evaluating offers involving options and multi-year contracting.

- **5.5.1 - Options**
- **5.5.2 - Multi-Year Contracting**

**Longer-Term Business Relationships.** Contracts are normally written to acquire supplies and services in support of identified requirements. Funded contracts include funds approved by Congress for the current year.

Options and multi-year contracting are two methods of establishing longer-term relationships with
contractors. Either of these techniques may be used in sealed bidding or negotiation.

5.5.1 Options

Contract Options (FAR 17.201 and FAR 17.207). Options are unilateral rights prescribed in a contract, which, for a specified time, permit the Government to elect to purchase additional supplies or services called for in the contract or to elect to extend the term of the contract. The Government is under no obligation to exercise any options prescribed in a particular contract.

Solicitation Requirements (FAR 17.203). When you expect that the contract(s) will include an option clause, include the clause and the related evaluation provision in the contract solicitation. Solicitations containing an option clause:

- Must:
  - State the basis of evaluation, either exclusive or inclusive of the option;
  - Inform offerors that the Government may exercise the option at time of award (when appropriate).
  - State that offerors may offer varying prices for options, depending on the quantities actually ordered and the dates (when appropriate).
  - Specify the price at which the Government will evaluate the option (e.g., highest option price offered or option price for specified requirements), whenever:
    - Offerors may offer varying prices for options, depending on the quantities actually ordered and the dates when ordered; and
    - The Government may exercise an option at the time of award.
  - When the solicitation requires that option price(s) not exceed those of the initial requirement:
    - Specify that the Government will accept an offer containing an option price higher than the base price only if the acceptance does not prejudice any other offeror; and
    - Limit option quantities for additional supplies to not more than 50 percent of the initial quantity of the same contract line item. In unusual circumstances, an authorized person at a level above the contracting officer may approve a greater percentage of quantity.

- Should normally not limit option prices. If prices will be considered in the evaluation for contract award, never limit option prices.
- May (in unusual circumstances) require that options be offered at prices no higher than those for the initial requirement (e.g., when the option cannot be evaluated for contract award or future competition for the option is impracticable).

Evaluation (FAR 17.206).

The solicitation must specify the option requirements and how option offers will be evaluated. Based on the evaluation provisions, your evaluation must either include or exclude option offers in your evaluation.

Step 2: Determine Offered Price(s).
Determine the price(s) in each offer for each item or group of items being considered for contract award. Also identify the price for any option that will be considered in evaluating offers for contract award.

Step 3: Evaluate Possible Award Combinations.
Evaluate offers using the specific criteria set forth in the solicitation.

Step 4: Make Award Decision.
Award to the firm whose offer provides the best value to the Government under the terms of the solicitation.

5.5.2 Multi-Year Contracting

Multi-Year Contracting (FAR 17.103, FAR 17.104, and FAR 17.105-1(d)). Multi-year contracting is a special contracting method used to acquire known requirements in quantities and total cost not exceeding planned requirements for up to five years (unless otherwise authorized by statute). This contracting method can be employed even though the total contract funds ultimately to be obligated are not available at the time of contract award. However, if funds are not appropriated to support the succeeding year's requirements, the agency must cancel the contract. The multi-year contract may provide for a cancellation payment to be made to the contractor if appropriations are not made.
The key difference between a multi-year contract and a multiple year contract is that the multi-year contract buys more than one year’s requirement without establishing and having to exercise an option for each program year after the first.

Solicitation Requirements (FAR 17.106-2). Solicitations for multi-year contracts must identify all the factors that will be considered in offer evaluation, including:

- Requirements by item of supply or service for the:
  - First program year; and
  - Each program year of the multi-year contact.
- Criteria for comparing the lowest evaluated offer for the first program year requirements to the lowest evaluated offer on the multi-year requirements.
- A provision that permits the Government to only consider offers for the first-year requirement, if the Government determines before award that only those requirements are needed.
- A provision specifying a separate cancellation ceiling (on a percentage or dollar basis) and applicable dates for each program year subject to cancellation.
- A statement that award will not be made on less than the first year program requirements.
- If Government administrative costs of annual contracting will be considered in offer evaluation, they must be reasonably estimated and stated in the solicitation.

Never use the cancellation ceiling as an offer evaluation factor.

General Evaluation Requirements.

The solicitation must identify all the factors related to multi-year contracting that will be considered in offer evaluation. Because the factors can be complex and vary substantially from contract to contract, you should take special care to assure that you understand all factors before you begin offer evaluation.

Step 2: Determine Offered Price(s).
Determine the price(s) for each offer for the first program year and each program year of the multi-year contract.

Step 3. Evaluate Possible Award Combinations.
Evaluate offers using the specific factors set forth in the solicitation, including criteria for comparing the lowest evaluated offer for the first program year requirements to the lowest evaluated offer on the multi-year requirements.

Step 4. Make Award Decision.
Award to the firm whose offer provides the best value to the Government under the terms of the solicitation.

5.6 Life-Cycle Costs
Life-Cycle Cost (FAR 7.101). Life-cycle cost is the total cost to the Government of acquiring, operating, supporting, and (if applicable) disposing of the items being acquired.

- Acquisition costs are all costs, including contract costs, associated with acquiring an item for Government use. For complex items, several contracts may be required and costs may involve research and development as well as production, delivery, and installation of the item.
- Operating and support costs are all costs, including contract costs, associated with equipment, supplies, and services needed to operate and maintain an operational system.
- Disposal costs are all costs, including contract costs, associated with removing equipment from service and disposing of it. Evaluations that consider life-cycle cost should also consider any significant salvage or resale value at the time of disposal.

When to Consider as a Price-Related Factor. Consider life-cycle cost in acquisition planning whenever the costs of item of system operation, support, and disposal are significant in comparison with the cost of acquisition. Consideration is particularly important when you expect that offers will include items that have substantially different operation, support, and disposal costs.

Source selection consideration can be appropriate for an item as simple as an automobile tire or as complex as a major weapon system. For more complex systems, planning should also address:

- Factors with a significant effect on life-cycle cost results, and implement tradeoff studies to evaluate alternative actions which could reduce costs related to those factors.
Life-cycle costs in product design.
Contract commitments (when appropriate) that will affect control of life-cycle cost results.
Follow-on efforts subsequent to purchase to further reduce life-cycle cost.

Solicitation Requirements. If you intend to consider life-cycle costs in offer evaluation, the solicitation must:

- Advise prospective offerors how life-cycle costs will be considered in making the contract award decision.
  - Award may be made based on lowest evaluated cost, including life-cycle costs, or life-cycle costs may be considered as a factor in an award decision that also considers other characteristics of the item or system.
  - When life-cycle costs continue over a period of years, solicitations will often provide for adjustments to consider one or more of the following:
    - Time value of money.
    - Cost uncertainty.
    - Inflation.
- Require offerors to estimate key elements of life-cycle cost. To estimate preparation, the solicitation must provide relevant information (e.g., projected item usage, operating environment, and the operating period that will considered in offer evaluation).
- Require offerors to provide relevant cost estimates along with appropriate information to support life-cycle cost estimates.
  - Estimate requirements typically include elements such as:
    - Average unit price, including (when appropriate) recurring and nonrecurring production costs;
    - Unit operating and support costs (e.g., manpower, energy, and parts requirements);
    - Unit disposal costs (e.g., the cost of removing equipment from the Government facility);
    - Unit salvage or residual value.
  - Related information should provide estimate support (e.g., test or operational data).

General Evaluation Requirements.

When life-cycle costs will be considered as a price-related factor in offer evaluation, the solicitation must identify life-cycle cost estimate requirements, the information needed to support those estimates, and how those estimates will be considered in making the contract award decision.

Step 2: Determine Offered Price(s).
Determine the price(s) for each offer. Also identify and evaluate life-cycle cost estimates required for offer analysis. Ask questions such as the following:

- Is the estimating methodology reasonable and supported by the information provided?
- Are the costs realistic when compared with other known information, including past cost performance?
- Is the estimate complete in its consideration of all identified cost elements?

Step 3. Evaluate Possible Award Combinations.
Evaluate offers using the specific criteria set forth in the solicitation, including any adjustments for:

- Time value of money;
- Cost uncertainty; or
- Inflation.

Step 4. Make Award Decision.
Award to the firm whose offer provides the best value to the Government under the terms of the solicitation.

5.7 Energy Conservation And Efficiency Factors
When to Consider as a Price-Related Factor (FAR 23.203). The cost of energy is an important cost of operating many items and systems. Accordingly, agencies must consider energy efficiency in the procurement of products and services. In particular:
• Acquisition team members must consider energy conservation and efficiency data along with estimated cost and other relevant factors in the preparation of plans, drawings, specifications, and other product descriptions.

Contracting officers should consider energy efficiency as a price related factor when the results would be meaningful, practical, and consistent with agency programs and needs. Consideration will typically be most meaningful when you are contracting for items or systems that consume substantial amounts of energy.

**Solicitation Requirements (FAR 23.202).** When you intend to consider energy efficiency as price-related factor in offer evaluation, the solicitation:

- Must advise prospective offerors how energy efficiency will be considered in making the contract award decision.
  - Award may be made based on lowest evaluated cost, including energy cost, or energy cost may be considered as a factor in an award decision that also considers other technical characteristics of the item or system.
  - When energy costs continue over a period of years, solicitations will often provide for adjustments to consider one or more of the following:
    - Time value of money.
    - Cost uncertainty.
    - Inflation.

- Should (when applicable) advise prospective offerors about energy efficiency standards that prescribe a minimum level of energy efficiency for covered contract items.

- Should (when applicable) require offerors to provide product information from the energy use and efficiency labels that provide information on covered contract items (e.g., central air conditioners, clothes dryers, clothes washers, freezers, and room air conditioners).

**General Evaluation Requirements (FAR 23.203).**

**Step 1. Determine Solicitation Provisions.**

When energy cost will be considered as a price-related factor in offer evaluation, the solicitation must identify any cost information required from each offeror and state how energy costs will be considered in making the contract award decision.

**Step 2. Determine Offered Price(s).**

Determine the price(s) in each offer for each item or group of items being considered for contract award. Also assure that the offer contains the information required by the solicitation to evaluate energy-related factors in price analysis.

**Step 3. Evaluate Possible Award Combinations.**

Evaluate offers using the specific criteria set forth in the solicitation, including any adjustments for:

- Time value of money;
- Cost uncertainty; or
- Inflation.

**Step 4. Make Award Decision.**

Award to the firm whose offer provides the best value to the Government under the terms of the solicitation.

**Evaluation Example.**

**Step 1. Determine Solicitation Provisions.**

Assume that you are acquiring 1,000 hot water heaters with a 50 gallon capacity. Because of extreme hard water conditions in area water systems, technical personnel estimate useful life at five years.

The solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price. It also includes the following provision:

Award will be made to the firm whose offer will provide the lowest total discounted cost of acquisition and ownership to the Government during the first five years of operation, considering price and energy cost. Estimates of energy cost will be based on the energy use and efficiency label provided by the manufacturer under 42 U.S.C. 6296

**Step 2. Determine Offered Price(s).**

You received two offers. The prices shown below are for 1,000 units. Annual energy costs are total estimated costs for the 1,000 units. Energy costs are based on the projected hours of operation and the energy use and efficiency label figures provided by each offeror and are calculated as follows:
Step 3. Evaluate Possible Award Combinations.
As stated in the solicitation provision, expenditures and receipts must be "discounted." In terms of your analysis, discounting refers to the financial concept of the time value of money. Under that concept, the net present value of a dollar paid (received) today is more than the net present value of dollar paid (received) at any future time, because the holder of the money can collect interest. Net present value, will depend on the amount of the payment (receipt), the discount (interest) rate, and the time when the payment (receipt) will take place. For example:
- If you must pay one dollar today, the net present value of the payment is one dollar;
- If you must pay one dollar one year from now and the discount (interest) rate is 10 percent, the net present value is $.90909. In other words, $.90909 invested at 10 percent interest will be worth approximately $1.00 at the end of one year.

Net present value analysis allows you to consider the time value of money in comparing alternatives with different expenditures/receipts at different points in time. Using net present value analysis, financial experts in your organization have calculated that the net present value of an annual energy cost for five years is the annual cost multiplied by 3.97581. The net present value of an annual cost of $1.00 for five years would be $3.97581 ($1 x 3.97581). The net present value of $100 for five years would be $397.581 ($100 x 3.97581). The net present value of $1,000 would be $3,975.81 ($1,000 x 3.97581).

In accordance with the solicitation provision, evaluate the offers by summing proposed price and net present value of the 5-year energy cost.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
<th>Annual Energy Cost</th>
<th>Net Present Value of 5-Year Energy Cost</th>
<th>Evaluated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$360,000</td>
<td>$560,000</td>
<td>$560,000 x 3.97581 = $2,226,453.60</td>
<td>$2,586,453.60</td>
</tr>
<tr>
<td>2</td>
<td>$370,000</td>
<td>$520,000</td>
<td>$520,000 x 3.97581 = $2,067,421.20</td>
<td>$2,437,421.20</td>
</tr>
</tbody>
</table>

Step 4. Make Award Decision.
Make award to the offeror with the lowest evaluated price, including consideration of annual energy-related costs for five years. In this case, Offeror 2 should receive the contract award.

5.8 Lease Vs. Purchase Factors
Lease vs. Purchase Decision (FAR 7.401). Agencies should consider whether to lease or purchase equipment based on a case-by-case evaluation of comparative costs and other factors.
- As a minimum, the acquisition team should consider the following factors:
  - Estimated length of time that the equipment will be used and the extent of use during that period;
  - Financial and operating advantages of alternative types of equipment;
  - Cumulative rental payments for the estimated period of use;
  - Net purchase price;
  - Transportation and installation costs;
  - Maintenance and other service costs; and
  - Potential obsolescence of the equipment because of imminent technological improvements.
- In addition, the acquisition team should consider the following factors (as appropriate) depending on the type, cost, complexity, and estimated period of equipment use:
- Availability of purchase options;
- Potential for use of the equipment by other agencies after its use by the acquiring agency;
- Trade-in or salvage value;
- Imputed interest; and
- Availability of a servicing capability, especially for highly complex equipment.

*When to Purchase* (FAR 7.402(a)). Generally, the purchase method is appropriate if the equipment will be used beyond the point at which cumulative leasing costs exceed purchase costs. The acquisition team should not rule out equipment purchase, in favor of leasing, merely because future technological advances might make the selected equipment less desirable.

*When to Lease* (FAR 7.402(b)(2)). The lease method is appropriate when it is advantageous to the Government. The lease method may also serve as an interim measure when the circumstances:

- Require immediate equipment use to meet program or system goals; but
- Do not currently support acquisition by purchase.

*When to Consider as a Price-Related Factor.* Generally the lease vs. purchase decision is not made as part of an evaluation of competitive offers. Rather, it is made based on data collected especially for that purpose. However, there are situations in which it may make sense to solicit such competition. For example, if equipment requires a unique maintenance capability, you might solicit competition to determine which alternative offers the best value, lease including maintenance or purchase with contract or in-house maintenance.

*General Evaluation Requirements.*

**Step 1. Determine Solicitation Provisions.**
The solicitation should define what costs you will consider in the award decision and how you will consider those costs. For example:

- Will you adjust a flow of expenditures over time for an imputed (assumed) cost of money?
- Will you adjust expenditure estimates to consider the probability of incurrence?

**Step 2. Determine Offered Price(s).**
Determine the price(s) in each offer for each item or group of items being considered for contract award. Also assure that each offer includes any other information required for offer evaluation.

**Step 3. Evaluate Possible Award Combinations.**
Evaluate offers using the specific criteria established in the solicitation.

**Step 4. Make the Award.**
Award to the firm whose offer provides the best value to the Government under the terms of the solicitation.

*Evaluation Example.*

**Step 1. Determine Solicitation Provisions.**
Assume that you have a requirement for material handling equipment to replace existing equipment that is beyond repair. Even with the new equipment, the present operating facility will close in 24 months. At that time, purchased equipment will be sold at auction. Rental equipment will be returned to the vendor. Because of the limited period of use, you are soliciting offers for lease as well as for purchase. You expect the operation and maintenance cost to be the same with all items offered, as a result you will only consider the costs related to acquisition and disposal.

The solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest discounted cost to the Government. It also includes the following provision: The Government will acquire the equipment identified in Section B by either lease or purchase. The method of acquisition and the successful offeror will be determined based on the lowest discounted total cost to the Government for acquisition and disposal. Operation and maintenance costs will not be considered in offer evaluation.

**Step 2. Determine Offered Price(s).**
Offers were received from two firms. One offer was based on Government purchase of the item, the other on Government lease. The proposed lease is for a two-year period.
Step 3. Evaluate Possible Award Combinations.

To evaluate the cost to the Government, you must consider all of the relevant costs and receipts that would result from purchase or lease of the equipment.

- **For the purchase**, there would be an expenditure of $146,000 at the beginning of Year 1 to purchase the equipment. There would also be a receipt at the end of Year 2 when the equipment is sold at auction. Your best estimate of the sale value is $6,000.

- **For the lease**, there would be an expenditure at the beginning of Year 1 for the first 12-month lease cost. There would be a second expenditure at the end of Year 1 for the second 12-month lease cost. There would be no receipt or expense at the end of Year 2.

As stated in the solicitation provision, expenditures and receipts must be “discounted.” In terms of your analysis, discounting refers to adjustment for the net present value of a dollar expenditure or receipt at a later time.

- A dollar spent at the beginning of Year 1 would not be adjusted.
- If the interest rate is 10 percent:
  - The net present value of $1.00 spent at the end of Year 1 would be $.90909 (i.e., $.90909 invested at 10 percent will be worth approximately $1.00 at the end of one year).
  - The net present value of a dollar to be spent or received at the end of Year 2 is $.82645 (i.e., $.82645 invested at 10 percent will be worth approximately $1.00 at the end of two years).

The net present value of a dollar to be spent or received at the end of Year 2 is $.82645 (i.e., $.82645 invested at 10 percent will be worth approximately $1.00 at the end of two years).

Using the established values for net present value at the end of one year and at the end of two years, the net present value of the purchase and lease options would be:
<table>
<thead>
<tr>
<th>Offeror</th>
<th>Beginning of Year 1</th>
<th>Expenditure End of Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Purchase)</td>
<td>$146,000</td>
<td>N/A</td>
<td>$9,917 ($12,000 x .82645)</td>
</tr>
<tr>
<td>2 (Lease)</td>
<td>$70,500</td>
<td>$64,091 ($70,500 x .90909)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Step 4. Make Award Decision.**

Make award to the offeror with the lowest evaluated cost to the Government, Offeror 2.

---

**5.9 Small Disadvantaged Business Price Evaluation Adjustment**

*Small Disadvantaged Business Price Evaluation Adjustment* (FAR 19.201(b) and FAR 19.1101).

The small disadvantaged business price evaluation adjustment (PEA) is a price-related factor that may be applied in contract award decisions where a small disadvantaged business (SDB) concern is competing with one or more concerns that are not SDB. Joint ventures that include an SDB may also qualify for a price adjustment if they meet requirements identified in the FAR.

The Department of Commerce will annually determine the applicable PEA factor(s). A factor may apply to all SDB concerns offering items in a North American Industry Classification System (NAICS) Industry Subsector or it may only apply to SDB concerns from identified regions of the country.

- The determination affects solicitations issued on or after the effective date of the determination. Ongoing acquisitions are not affected.
- The effective date of the determination must be no less than 60 days after its publication date.

Determinations are summarized on the Internet at Subpart 19.11—Price Evaluation Adjustment for Small Disadvantaged Business Concerns.

*When to Consider as a Price-Related Factor* (FAR 19.1102 and DoD Class Deviation).

All competitive solicitations must provide for consideration of the applicable PEA set by the Department of Commerce (DoC) unless one of the following exemptions applies:

- The acquisition is:
  - Less than or equal to the simplified acquisition threshold;
  - Awarded pursuant to the 8(a) program;
  - Set aside for small business concerns;
  - Set aside for HUBZone small business concerns;
  - Set aside for service-disabled veteran-owned small business concerns;

- Also,
  - Where price is not a selection factor so that a price evaluation adjustment would not be considered; or
  - Where all fair and reasonable offers are accepted.

Your agency may also have the authority to deviate from the PEA requirement. For example, Subsection 2323(e) of title 10, United States Code, as amended by section 801 of the Strom Thurman Defense Authorization Act for Fiscal Year 1999 and section 816 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003, requires the Department of Defense to suspend the regulation implementing the PEA requirement if the Secretary of Defense at the beginning of the fiscal year determines that the DoD achieved the 5 percent goal for SBD awards in the most recent fiscal year for which data are available.

*Solicitation Requirements.* (FAR 19.308, FAR 19.1104, FAR 52.219-1, and FAR 52.219-23).

Assure that the FAR Small Business Program Representations provision is inserted in any solicitation that exceeds the micro-purchase threshold when the contract is to be performed inside the United States, its territories or possessions, Puerto Rico, the Trust Territory of the Pacific Islands, or the District of Columbia. Among other things, this provision permits each offeror to represent that it is an SDB. Review Subpart 19.11—Price Evaluation Adjustment for Small Disadvantaged Business Concerns to determine if a PEA applies to the NAICS of one or more of the items included in a solicitation and the amount of the...
required adjustment. When a PEA applies to any solicitation item and the solicitation is not otherwise exempted from the requirement:

- Insert the FAR Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns clause in the solicitation. If a PEA is authorized on a regional basis, insert the clause even if the place of performance is not in an authorized region.
  - Use Alternate I of the clause when the contracting officer determines that there are no SDB manufacturers that can meet the requirements of the solicitation. This alternate permits the contractor to provide end items manufactured by any small business instead of end items manufactured by an SDB as required by the basic FAR clause.
  - Use Alternate II of the clause when a price evaluation adjustment is authorized on a regional basis. This alternate only permits a PEA adjustment when it might affect award to an SDB in the designated region.

Assure that the appropriate PEA percentage is inserted into the FAR Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns clause.

**General Evaluation Requirements.** (FAR 19.1103 and 52.219-1(b)(2)).

**Step 1. Determine Solicitation Provisions.**
The solicitation must identify all factors that will be considered in offer evaluation. In particular:

- Assure that the solicitation includes the FAR Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns clause and the Small Business Program Representations provision.
- Review offeror representations to identify any SDB offerors.
- Identify the PEA percentage cited in the FAR Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns clause.
- Identify any SDB offerors that have waived PEA use in offer evaluation. Offerors may waive use for many different reasons (e.g., inability to comply with requirements to obtain manufactured items from an SDB).

**Step 2. Determine Offered Prices**
Determine the price(s) in each offer for each item or group of items being considered for contract award.

**Step 3. Evaluate Possible Award Combinations.**
Evaluate offers using the specific criteria set forth in the solicitation. Add other evaluation factors (e.g., transportation costs or factors to consider rent-free use of Government facilities) to the offers before applying the price evaluation adjustment. In applying the PEA:

- As you evaluate offers, add the PEA factor cited in the FAR Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns clause to all offers, except offers from:
  - SDB concerns that have not waived the PEA; or if the PEA for small disadvantaged business concerns is authorized on a regional basis, offers from small disadvantaged business concerns, whose address is in such a region, that have not waived the PEA;
  - otherwise successful offers from historically black colleges and universities or minority institutions
- Apply the PEA factor on a line item or a group of line items on which award may be made.
- Do not evaluate offers using the PEA when it would cause award, as a result of this adjustment, to be made at a price that exceeds fair market price by more than the factor as determined by the Department of Commerce.

**Step 4. Make Award Decision.**
Award to the firm whose offer provides the best value to the Government under the terms of the solicitation.

(FAR 19.1103 and FAR 52.219-23(c), DFARS 225.000-70 and DFARS 252.225-7001)

**Evaluation Example** (FAR 19.1103, FAR 52.219-1(b)(2), and FAR 52.219-23(c)).

**Step 1. Determine Solicitation Provisions.**
Assume that the solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price.

- It also includes the FAR Notice of Price Evaluation Adjustment (PEA) for Small Disadvantaged Business Concerns clause and the Small Business Program Representations provision.
Step 2. Determine Offered Price(s).

Three domestic offers were received. Offeror 1 is a large business, but not an SDB concern. Both Offeror 2 and Offeror 3 are SDB concerns. However, Offeror 3 has waived PEA use in offer evaluation.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Evaluation Status</th>
<th>Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Large Business</td>
<td>$365,000</td>
</tr>
<tr>
<td>2</td>
<td>SDB -- No PEA Waiver</td>
<td>$401,500</td>
</tr>
<tr>
<td>3</td>
<td>SDB -- Waived PEA</td>
<td>$396,000</td>
</tr>
</tbody>
</table>

Step 3. Evaluate Possible Award Combinations.

Using the 10 percent PEA factor cited in the solicitation, the evaluated price for each offer is shown below:

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
<th>Price Evaluation Adjustment</th>
<th>Evaluated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$364,000</td>
<td>$365,000 x .10 = $36,400</td>
<td>$400,400</td>
</tr>
<tr>
<td>2</td>
<td>$401,500</td>
<td>-</td>
<td>$401,500</td>
</tr>
<tr>
<td>3</td>
<td>$396,000</td>
<td>$396,000 x .10 = $39,600</td>
<td>$435,600</td>
</tr>
</tbody>
</table>

Step 4. Make the Award.

Make award to the offeror with the lowest evaluated price, Offeror 1.

5.10 HUBZone Price Evaluation Preference

**HUBZone Program** (FAR 19.1301, FAR 19.1305, FAR 19.1306, and FAR 19.1307).

The Historically Underutilized Business Zone (HUBZone) Act of 1997 created the HUBZone Program (sometimes referred to as the HUBZone Empowerment Contracting Program). The purpose of the Program is to provide Federal contracting assistance for qualified small business concerns located in historically underutilized business zones, in an effort to increase employment opportunities, investment, and economic development in those areas.

**Participating Agencies.** Until September 30, 2000, only following agencies will participate in the HUBZone Program:

- Department of Agriculture.
- Department of Defense.
- Department of Energy.
- Department of Health and Human Services.
- Department of Housing and Urban Development.
- Department of Transportation.
- Department of Veterans Affairs.
- Environmental Protection Agency.
- General Services Administration.
- National Aeronautics and Space Administration.

On or after September 30, 2000, all Federal agencies that employ one or more contracting officers will
participate in the Program.

Solicitation Requirements (FAR 13.307(a), FAR 19.1308, FAR 52.219-1, and FAR 52.219-4).

If you are in a participating agency:

- Assure that the FAR Small Business Program Representations provision with its Alternate II is inserted in any solicitation that exceeds the micro-purchase threshold when the contract is to be performed inside the United States, its territories or possessions, Puerto Rico, the Trust Territory of the Pacific Islands, or the District of Columbia. Among other things, this provision permits each offeror to represent that it is a HUBZone small business concern.
- When you anticipate full and open competition, assure that the FAR Notice of Price Evaluation Preference for HUBZone Small Business Concerns clause is inserted in any solicitation that exceeds the micro-purchase threshold. This clause:
  - Informs prospective offerors that a 10-percent PEP will be considered in contract award;
  - Establishes guidelines that an offeror must meet to qualify for the evaluation preference, including related contract performance requirements; and
  - Permits the offeror to waive PEP consideration.

General Evaluation Requirements (FAR 19.1307 and FAR 52.219-1(b)).


The solicitation must identify all factors that will be considered in offer evaluation. In particular:

- Assure that the solicitation includes the FAR Notice of Price Evaluation Preference for HUBZone Small Business Concerns clause and the Small Business Program Representations provision with its Alternate II.
- Review offeror representations to identify any offeror representing that it is a HUBZone small business concern.
- Identify any HUBZone concern that has waived PEP consideration. Offerors may waive PEP consideration for many different reasons (e.g., inability to comply with requirements that at least 50 percent of all manufacturing cost (excluding materials cost) will be performed by the contractor or another HUBZone small business concern).

Step 2. Determine Offered Prices

Determine the price(s) in each offer for each item or group of items being considered for contract award.

Step 3. Evaluate Possible Award Combinations.

Evaluate offers using the specific criteria set forth in the solicitation. As you evaluate offers consider the following PEP requirements:

- For each offer, calculate the base offer (BO). The BO is the total evaluated price considering all price-related evaluation factors (e.g., transportation cost, small disadvantaged business concern price evaluation adjustment (PEA), etc.) except the PEP.
- Calculate the final evaluated price.
  - For the following offers, the Base Offer (BO) is the final evaluated price:
    - Offers from HUBZone small business concerns that have not waived the PEP;
    - Otherwise successful offers from small business concerns;
    - Otherwise successful offers of eligible products under the Trade Agreements Act when the acquisition equals or exceeds the applicable FAR dollar threshold; and
    - Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.
  - For other offers:
    - If a PEA was added to the offered price in calculating the BO, calculate the final evaluated price as follows:
      \[ \text{Final Evaluated Price} = \text{BO} + (.10 \times (\text{BO} - \text{PEA})) \]
    - If a PEA was not added to the offered price in calculating the BO, calculate the final evaluated price as follows:
      \[ \text{Final Evaluated Price} = \text{BO} + (.10 \times \text{BO}) \]

Step 4. Make Award Decision.

Award to the firm whose offer provides the best value to the Government under the terms of the solicitation.
Evaluation Example (FAR 19.1103 and FAR 52.219-1(b)).

Assume the solicitation states that award will be made to the responsible offeror with a technically acceptable offer and the lowest evaluated price. It also includes the FAR:
- Notice of Price Evaluation Preference for HUBZone Small Business Concerns clause;
- Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns; and
- Small Business Program Representations provision with its Alternate II.

Step 2. Determine Offered Price(s).
Four domestic offers were received. Offeror 1 is an SBD concern located in a HUBZone. Offeror 2 is an SDB not located in a HUBZone. Offeror 3 is a small business not located in a HUBZone. Offeror 4 is a large business. The HUBZone concern did not waive the PEP.

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Evaluation Status</th>
<th>Offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HUBZone SBD</td>
<td>$220,000</td>
</tr>
<tr>
<td>2</td>
<td>SBD</td>
<td>$231,000</td>
</tr>
<tr>
<td>3</td>
<td>Small Business</td>
<td>$240,000</td>
</tr>
<tr>
<td>4</td>
<td>Large Business</td>
<td>$223,200</td>
</tr>
</tbody>
</table>

Step 3. Evaluate Possible Award Combinations.
A 10-percent PEA is only price-related factor that must be considered before PEP evaluation. The calculation of the final evaluated price is shown below:

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
<th>Base Offer (After PEA)</th>
<th>Final Evaluated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$220,000</td>
<td>$220,000</td>
<td>$220,000</td>
</tr>
<tr>
<td>2</td>
<td>$210,000</td>
<td>$210,000</td>
<td>$210,000 + [.10 x $210,000] = $231,000</td>
</tr>
<tr>
<td>3</td>
<td>$200,000</td>
<td>$200,000 + [.10 x $200,000] = $220,000</td>
<td>$220,000 + [.10 x ($220,000 - $20,000)] = $240,000</td>
</tr>
<tr>
<td>4</td>
<td>$186,000</td>
<td>$186,000 + [.10 x $186,000] = $204,600</td>
<td>$204,600 + [.10 x $186,000] = $223,200</td>
</tr>
</tbody>
</table>

Step 4. Make the Award.
Make award to the offeror with the lowest evaluated price, Offeror 1.

Evaluation Example Note. Suppose that the contracting officer rejected Offer 4 because Offeror 4 was nonresponsible. That would affect the remainder of the analysis because you must not add the PEP to an otherwise successful offer from a small business concern. The calculation of the final evaluated price is shown below:

<table>
<thead>
<tr>
<th>Offeror</th>
<th>Offer</th>
<th>Base Offer (After PEA)</th>
<th>Final Evaluated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$220,000</td>
<td>$220,000</td>
<td>$220,000</td>
</tr>
<tr>
<td>2</td>
<td>$210,000</td>
<td>$210,000</td>
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<tr>
<td>3</td>
<td>$200,000</td>
<td>$200,000 + [.10 x $200,000] = $220,000</td>
<td>$220,000 + [.10 x ($220,000 - $20,000)] = $240,000</td>
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Now Offeror 2 has the lowest evaluated price after all other price-related factors are considered.

- 6.0 - Chapter Introduction
- 6.1 - Selecting Prices For Comparison
  - 6.1.1 - Other Proposed Prices
  - 6.1.2 - Commercial Prices
  - 6.1.3 - Previously-Proposed Prices And Contract Prices
  - 6.1.4 - Parametric And Rough Yardsticks Estimates
6.0 Chapter Introduction
The figure below depicts the process involved in making price comparisons for price analysis.

Comparisons in Price Analysis for commercial and non-commercial items (FAR 15.404-1(b)(1)). Price analysis:
- Is the process of examining and evaluating a proposed price to determine if it is fair and
reasonable without evaluating its separate cost elements and proposed profit. Price analysis may, however, be supported by cost analysis of cost elements and/or profit when price analysis alone cannot determine a fair and reasonable price necessary.

● Always involves some form of comparison with other prices.

Hence, you compare prices to determine whether the price from the apparent successful offer is fair and reasonable. The basis for your comparison should be a price that has been determined a reasonable estimate of the price a reasonable person is willing to pay.

**Should-Pay Price.** The should-pay price, used for comparison, is the price that, in your best judgment, the Government should reasonably expect to pay for the deliverable based on available information concerning competitive offers, historical prices previously paid, validated commercial prices, pricing yardsticks, and Independent Government Estimates (IGE).

Bear in mind the that your should-pay price is an estimate and therefore just an approximation of the price the Government can expect to pay. Being an estimate, it is by definition inexact. If the estimate was developed using validated and supported information, with sound rationale, and you have done a good job of price analysis, your should-pay price should be sufficient for negotiations. Still, don't be dogmatic about your the estimate - to the point of rejecting offers that are close to, but not exactly at, your should-pay price estimate.

If the apparent successful offer is significantly higher or lower than your the developed Government estimate:

● Determine Investigate the possible reasons why there is a significant variance between the should-pay price and that offered price, document you findings, and then determine if the Government should open communications or discussions, which ever is relevant.

Make the critical price-related decisions in awarding contracts through sealed bidding or negotiations.

**Comparability.** Comparability is the quality or state of being comparable and having features in common with something else to permit or suggest comparison. Products do not have to be alike to be compared. Any two things can be compared, but the comparison may show that they have no characteristics in common. However, If you are attempting to evaluate price reasonableness, the comparison will not be of any value if the items are unlike in every way.

For price analysis, the items being compared must have enough similar characteristics or qualities to make the comparison useful. The more similar the items are, the easier the comparison. If your examination discloses significant differences, you may need to quantify the effect of those differences (e.g., acquisition of different products, at different times, or in different places, or under different terms and conditions) and make adjustments before you can reach valid conclusions about price reasonableness.

The greater the dissimilarities and the more subjective your adjustment, the greater the possibility for doubts about your conclusions and the less likely that your analysis will be persuasive.

**Multiple Comparisons.** Use the information gathered during your market research to make multiple comparisons in determining price reasonableness and increase confidence in your pricing decision.

For example, adequate price competition is normally considered one of the best bases for price analysis. However, you can have apparent competition and still have prices that are unreasonably high. How would you know? You must consider other bases for price analysis (e.g., historical prices, catalog prices, or market prices).

The number of comparisons that you consider should depend on the availability of information and the pricing risk involved in the acquisition.

● If the information is readily available in a form that can be used for price analysis, why not consider it? A quick comparison will increase your confidence of price reasonableness.

If the price is to high, to low, or you still have concerns about price reasonableness after your initial comparison, the risk involved makes it particularly important to consider other comparisons.

**Comparison Steps.** Each different comparison will involve different information and some bases will require substantial adjustment prior to making your analysis. However, the comparison process is described in five steps outlined below.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Questions to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Select prices for comparison: Other</td>
<td>Would this comparison be valid? Are more comparable prices available? Were previously proposed prices considered from</td>
</tr>
</tbody>
</table>
|   | proposed prices;  
|   | • Commercial prices;  
|   | • Previously-proposed prices and contract prices;  
|   | • Parametric estimates or rough yardstick estimates; or  
|   | • Independent Government Estimates  
|   | reasonable sources and can be validated?  
|   | Was the validity of the comparison and the reasonableness of the previous price(s) paid established and supported? It is not adequate to just compare the price to a previous contract unless the contract used for comparison can establish price reasonableness to include supporting rational.

|   | Have I considered all potentially significant factors, including differences in:  
|   | • Market and economic conditions;  
|   | • Quantity or size;  
|   | • Geographic location;  
|   | • Purchasing power of the dollar;  
|   | • Extent of competition;  
|   | • Technology; or  
|   | • Terms and conditions under contracts (e.g., differences in features or capabilities, delivery lead-times, one-time costs, etc.) resulting from adequate competition.

|   | How substantial is the impact? In view of these factors and their impact, will the contemplated comparison have any credibility?

|   | Have I accounted for all factors that can impact the price? What techniques should be applied in making the adjustment? How much reliance can I place on the resulting estimate?

|   | How much weight should I place on each comparison? If adjusted prices differ substantially from the apparent successful offer, what price should the Government reasonably expect to pay? Are significant factors identified and are the substantial differences accounted for?

## 6.1 Selecting Prices For Comparison

This section identifies and defines five potential bases for various price analysis techniques. After defining each base technique, special considerations for using each technique base are outlined.

- **6.1.1 - Other Proposed Prices**
- **6.1.2 - Commercial Prices**
- **6.1.3 - Previously-Proposed Prices And Contract Prices**
- **6.1.4 - Parametric And Rough Yardsticks Estimates**
- **6.1.5 - Independent Government Estimates**

*Price Analysis Techniques Potential Bases (FAR 15.404-1(b)). You may select any of the following techniques bases for price analysis:*
Comparison of Other proposed prices received in response to the solicitation;
Comparison with commercial prices including competitive published price lists, published commodity market prices, similar indexes, and discount or rebate arrangements;
Comparison to previously-proposed prices, historical prices paid by the Government or other than the Government, and contract prices for the same or similar end items, if you can establish both the validity of the comparison and the reasonableness of the previously proposed prices;
Parametric estimates or estimates developed using rough yardsticks; or
Independent Government Estimates.

One of the techniques basis for price analysis identified in the FAR is "prices for the same or similar items obtained through market research." Because market research can span commercial prices, previously-proposed prices, contract prices, parametric or rough yardstick estimates, and Independent Government Estimates, this technique basis for price analysis will not be considered separately.

Types of comparisons used in price analysis typically vary with the estimated dollar value of the contract.

**Micro-purchases. (FAR 13.2)** Micro-purchases may be awarded without soliciting competitive quotes if the contracting officer or individual appointed in accordance with FAR 1.603-3(b) considers the price to reasonable. The administrative cost of verifying the reasonableness of the price may be less than offset potential savings from the effort, so verifying price reasonableness need only be taken if:
- You suspect or have information to indicate that the price may not be reasonable; or
- Purchasing a supply or service for which no comparable pricing information is readily available.

**Other Simplified Acquisitions (FAR 13.1).** Comparing competitive quotes is the preferred method for pricing these acquisitions.
- If you only receive one quote, consider the following bases for price analysis [(13.106-3(a)(2)]:
  o Prices identified during market research;
  o Prices found reasonable for previous purchases;
  o Current price list, catalog, or advertised prices;
  o Prices for similar items in a related industry;
  o Price estimates developed during value analysis;
  o Personal knowledge of item prices;
  o The Independent Government Estimate; or
  o Any other reasonable base for price analysis.

**Contracts over the Simplified Acquisition Threshold.** Consider every type of comparison which you believe provides a valid should-pay price.
- For example, if you have data on previous or historical contract prices paid and have reason to believe that these data reflect good prior decisions on price reasonableness or the data has been validated, then compare the apparent successful offer to those prices. If you have reason to believe that previous contract prices were not reasonable, then give little or no weight to those prices as you perform your price analysis. If you have no price history, you must rely on other comparison techniques bases for your price analysis. If you do compare to previous or historical contract prices, make sure that you adjust those prices to reflect differences in quantity, economic conditions, and the differing terms & conditions.

### 6.1.1 Other Proposed Prices

**Proposed Prices (FAR 15.404-1(b)(2)).** Comparison of a proposed price with other proposed prices received in response to the same solicitation is generally considered one of the preferred techniques best bases for price analysis, because all offers were submitted to meet the same requirement during the same time period.

**Using Proposed Prices (FAR 15.403-1(c)(1)).** Any proposed price used as a base for prices analysis must meet the following general requirements:
- The price must be submitted by a firm competing independently for contract award.
- The price must be part of an offer that meets Government requirements.
- Award must be made to the offeror whose proposal represents the best value to the
If you have more than one competitive offer, you could use more than one offer in your analysis. **Do not** use the price from any offer that you would not consider for contract award as a basis for price analysis.

- Never use an offer from a firm that you have determined is nonresponsible.
- In sealed bidding, never use a nonresponsive bid.

In negotiations, never use a price from a proposal that is technically unacceptable.

You should normally place less reliance on comparisons with other proposed prices when:

- The solicitation was made under conditions that unreasonably denied one or more known and qualified offerors an opportunity to compete.
- The apparent successful offeror has such a decided advantage that it is practically immune from competition.
- The apparent successful offeror's price is significantly different (higher or lower) than the next rated offeror. This could indicate that there is a mistake in bid, a misunderstanding of the contract requirements, etc. In this situation, you should take steps to verify the offeror's bid and/or use another technique to analyze the price.
- Another price comparison, cost analysis, or a cost realism analysis indicates that the apparent successful offer may be unreasonable (too high or too low).
- Government requirements permit offerors to propose widely different technical approaches to contract performance. For example, a ceramic mug and a paper cup may both meet a requirement to hold 8 ounces of coffee, but that does not mean that $1.00 price for a paper cup is reasonable because it is less than a $5 price for a ceramic mug. Even if no other offeror is proposing to provide a paper cup, the key element of your price analysis should be to compare the paper cup offer with prices paid for similar paper cups.
- Price is not a substantial factor in the evaluation of offers for contract award. However, the Comptroller General (CGEN) has found adequate price competition in cases where price was assigned a weight of only 20 percent in the award decision.
- All offerors are expected receive contract awards. In such cases, there may not be sufficient competitive pressure to foster fair and reasonable pricing.

### 6.1.2 Commercial Prices

**Commercial prices** are prices being paid by the general public for a product. **These prices can be used for comparison purposes when purchasing that product or one that is similar to that product.** The circumstances of your purchase may be different from the commercial sales, but data on commercial sales can provide valuable information for use in contract pricing.

**Using Commercial Prices**

- **Competitive Published price list** -- prices taken from a catalog, price list, schedule, or other verifiable and established record that is regularly maintained by a manufacturer or vendor and is published or otherwise available for customer inspection. For pricing purposes (but not cost or pricing data exception purposes), you can consider published pricing information from the firm submitting the offer and/or published pricing information from other firms offering similar products.
- **Competitive Published market prices of Commodities** -- prices established in the course of ordinary and usual trade between buyers and sellers free to bargain that can be substantiated from sources independent of the offeror. Normally, market pricing information is taken from independent market reports, but a market price could be established by surveying the firms in a particular industry or market.
- **Similar indexes** -- commercial item prices established using a means other than those described above. For example, an offeror might provide information on the prices charged commercial customers over a period of time. Such a record would not qualify as published price list or market price since the price was not independently verifiable, but it would provide a good record of the firm's commercial pricing practices.

**Discounts Arrangements.** Commercial sales typically include discounts for different types of customers. Discount amounts typically depend on the product and the marketing strategy of the firm. Common
factors affecting discounts include, services provided by the seller (e.g., wholesale and retail sales) and the importance of the sale (e.g., dollars involved or the relationship to other sales).

**Rebate Arrangements.** Rebates are often offered to various customers based on the customer's total purchases over a specific period of time. For example, automobile manufacturers typically offer dealers rebates, based on total sales. That is one reason why dealers can advertise sales “at invoice.” Dealer profit is based on the rebate amount.

**Contracting Situation Differences.** Remember that your contracting situation may be different than the situation in the commercial market. For example, the offeror may provide services to commercial customers that are not required by the Government. If the Government is receiving less, you should expect to pay less. You must identify these differences and determine what impact, if any, they have on the price of the item. This analysis will form the basis of both the negotiation of the terms and conditions (including price) related to your contract and the associated price reasonableness determination.

### 6.1.3 Previously-Proposed Prices And Contract Prices

**Historical Prices (FAR 15.404-1(b)(2)).** Previously-proposed prices and validated contract prices that were paid (whether by the Government or other than the Government) are historical prices paid for same or similar items—prices related to past purchasing activity. The purchase associated with a particular price may have been made by your office or another office with similar requirements. Note: The prior price used for comparison must be validated and reasonably current in order to be used for comparison analysis.

**Using Historical Prices.** Whenever you consider using historical prices to analyze price reasonableness, ask the following questions:

- **Has the product been purchased before?**
  The purchase may have been made by your procurement office or by another purchasing office.

- **What was the historical price?**
  You can obtain price information from purchase files, computer data files, or manual inventory item records.

- **Was the historical price fair and reasonable?**
  For a historical price to be useful in determining the reasonableness of an offered price, you must know that the historical price was fair and reasonable. Be careful! It is not uncommon to review an item purchase history and find that no other than that the last price paid has a significant time lapse between the last acquisition and the present one, the terms and conditions are significantly different, been used for years to determination of price reasonableness may be uncertain. In one study, the entire pricing histories for several items were reviewed and analysts found that for every acquisition except the first, the determination of price reasonableness was based on the last price paid. Analysts also found that the first acquisition was a multiple-item acquisition and while there was an analysis of the reasonableness of the overall acquisition price, no one ever examined the reasonableness of individual item prices. In other words, for years contracting officers found prices reasonable based on an arbitrary decision made during the first acquisition. The analysis You must ensure that the prior price was determined fair and reasonable based on an adequate price or cost analysis and the basis can be validated. Often, this may only require a phone call to the other contracting activity to obtain assurance that an adequate price/cost analysis was previously performed.

- **Is the comparison valid?**
  For the comparison to be valid, you must be able to identify and consider any item or market differences that might significantly affect contract price. A proper analysis validates the basis on which the prior price paid was determined fair and reasonable by examining the prior price to ensure there has not been a significant time lapse, the terms and conditions are not significantly different, and the reasonableness of the price is not uncertain. If these conditions cannot be met or information is lacking in documentation then the prior price may not be a valid basis for comparison.

- **Was the Price Adjusted?**
  The prior price must be adjusted to account for materially differing terms and conditions, quantities and market and economic factors. For similar items, the contracting officer must also adjust the prior price to account for material differences between the similar item and the item being procured (FAR 14.404-1(b)(2)(ii)(B)). The analysis must also account for minor modifications.
6.1.4 Parametric And Rough Yardsticks Estimates

Cost Estimating Relationships (FAR 15.404-1(b)(2)). Cost estimating relationships (CERs) are used to develop parametric estimates or rough yardstick estimates. A CER is a formula for estimating prices based on the relationship of past prices with one or more product physical or performance characteristics (e.g., dollars per pound or dollars per horsepower). Whenever you can relate item price with the value of one or more physical or performance characteristics, you can use the relationship to estimate the price of a similar product. For example, builders commonly estimate the price of a planned building by multiplying the number of square feet in the building by an estimated cost per square foot. However, watch out for material differences or conditions such as a steel building vs. a stick building or a building meant to withstand harsh weather conditions. Significant differences may warrant additional pricing inquiry leading to possible discussions with offerors. Parametric estimating can only be done if these items are within range of the data used to establish the CER.

For more detailed information related to parametric estimating, see the Parametric Estimating Handbook. Using Cost Estimating Relationships. Whenever you consider using a CER to determine price reasonableness, ask the following questions:

- **Has the CER been widely accepted in the market place?**
  Determine whether both buyers and sellers agree on the validity of a particular relationship/yardstick and the reasonableness of values used in estimating. Sellers may use a relationship/yardstick that produces an estimate higher than that normally accepted by buyers.

- **Does the CER produce reasonable results?**
  The user of the relationship/yardstick has the burden of demonstrating that the relationship/yardstick produces reasonable estimates. The user should be able to demonstrate the data and calculations used to develop the relationship/yardstick.

- **How accurate is the CER?**
  Validate the using known product data and prices. Examine the accuracy of the results. Remember that even a properly developed pricing relationship/yardstick will not always predict price exactly. Some relationship/yardsticks are very accurate others will only give you a rough approximation of the proper price. If the variation is wide and there is no other means to determine price reasonableness then data other then certified cost or pricing data may be required from the offeror. As relationship/yardstick accuracy decreases, the weight that you place on the relationship/yardstick in your pricing decision should also decrease.

6.1.5 Independent Government Estimates (IGE)

Independent Government Estimates. As the name implies, an Independent Government Estimate is an estimate made by the Government. This section will define and consider three types of Independent Government Estimate.

- The most common is the Independent Government Estimate, also known as the Independent Government Cost Estimate (IGCE), that accompanies the purchase request.
- A value analysis estimate results from a specialized analysis of the function of a product and its related price. It may literally involve taking the item apart to determine how it is made and why it costs what it does.
- A visual analysis estimate results from a visual inspection of an item, or drawing of an item, to estimate its probable value.

General Guidelines on Using Independent Government Estimates. The IGE is a useful tool used for comparison to the proposed price. The IGE is developed based on the most recent data determined to fulfill the Government’s requirement and should accompany the procurement request. The submitted cost estimate shall include a basis for the Government’s estimate using current validated data whether at the price level or at the cost element level. If an industry standard is used for validation then state why the selected industry standard is the most appropriate authority. The dollar value, type procurement, and the complexity of the procurement will determine how detailed the IGE is to be. Cost element or price values alone are not adequate without a basis to support the estimated values. The cost estimate does not have to be an exact match to the offeror’s proposal to be used as a comparison, but should have adequate
information to determine how the Government’s approach to the estimate compares to the offerors understanding of the requirement. Differences in the comparison shall be analyzed and documented. The IGE should not be adjusted to the offerors price as the offerors approach may have differences the Government did not account for and may warrant additional pricing inquiry. The analyst must provide an adequate narrative validating the source or the basis of the information comprising the estimate. The details of the IGE are significantly more critical in a sole source environment where no competition exists and or where an exemption may exist from obtaining cost or pricing data from the offeror. The IGE may also be used as a comparison where two or more offers are received but only one offer is considered technically acceptable. Earlier in this text, you learned five questions to ask when analyzing the reliability and validity of Government purchase request estimates. Ask the same questions of any Independent Government Estimate before using it as a basis for comparison with offered prices.

- **How was the estimate developed made?**
- **What assumptions were made?**
- **Were any differences in the comparison work statement accounted for?**
- **What information and tools were used?**
- **Where was the information obtained?**
- **How did previous estimates compare with prices paid?**
- **Were unique conditions applied to the prior procurements and do not apply now?**

**Special Considerations for Using Value Analysis.** You may apply the techniques of value analysis to any product, regardless of its complexity. However, generally consider only those products offering potential cost reductions that merit the time and cost of the analysis required. Value analysis provides information on product value in comparison with possible substitutes. It is particularly useful when:

- The Independent Government Estimate is the only price analysis technique base available; or
- The product does not seem to be worth the price quoted.

To be effective, value analysis must be performed by individuals familiar with the product, or product material differences, and its use by the Government. Actual analysis should follow a 5-step process:

1. Determine acquisition costs based on current proposal or other estimates.
3. Identify alternative products or methods of meeting the minimum needs of the Government. This is typically the key step in the analysis. The following are examples of questions you should consider:
   - **Can any part of the product be eliminated?**
   - **Can a standard part replace a special part?**
   - **Can a lower cost material or method be used?**
   - **Can paperwork requirements be reduced?**
   - **Can the product be packaged more economically?**
4. Estimate the costs associated with alternative products or methods that would meet the minimum needs of the Government.
5. Document the reasonableness of the current prices or recommend appropriate changes.

Assure that the process and results of the value analysis are clearly documented and include a copy of the documentation in the contract file. When you are satisfied that the value received supports the offered price, use that information to support your determination of price reasonableness. When you are not satisfied, use the information to document efforts to bring price in line with perceived value.

**For example:** Suppose you are purchasing a pair of shoes. Shoes are used to walk in, to protect the feet, to keep the feet warm, and to enhance appearance. If shoes are to be attractive, they must be made of certain types and quality of material. If appearance is not important to the Government, a less attractive, less expensive, but possibly more durable material can be used. By changing the quality of material required, price will change.

**Special Considerations for Using Visual Analysis.** In visual analysis, the analyst examines obvious external features of the product to determine value and related price. This technique is nothing more than
technical experts comparing the product with other products by sight. Consider using visual analysis as a pricing tool:

- In place of value analysis for products that do not offer potential cost reductions that merit the time and cost of analysis required for detailed value analysis.
- To review large numbers of products to identify any that appears to offer potential cost reductions that merit the time and cost associated with detailed value analysis.

6.2 Identifying Factors That Affect Comparability

Introduction. When comparing prices, you must attempt to account for any factors that affect comparability. The following factors deserve special consideration because they affect many price analysis comparisons:

- Market conditions;
- Quantity or size;
- Geographic location;
- Purchasing power of the dollar;
- Extent of competition;
- The specific terms and conditions of the acquisition;
- Technology; and
- Government unique requirements.

Market Conditions. Market conditions change. The passage of time usually is accompanied by changes in supply, demand, technology, product designs, pricing strategies, laws and regulations that affect supplier costs, and other such factors. An effort to equate two prices, separated by five years, through a simple inflation adjustment may not be successful. Too many characteristics of the market are likely to have changed. Do not stretch data beyond their limits. Generally select the most recent prices available. The greater the time lapse between the last acquisition and the current one difference, the greater the likelihood and impact of differences in market conditions. If you are comparing a current offer with a prior price, the ideal comparison would be with a contract price agreed to yesterday. That comparison would limit the effects of time on market conditions. However, do not select a price for comparison merely because it is the most recent. Look instead for prices that were established under similar terms and market conditions. For instance, if you are buying commodity in the month of October, offers from the previous years month of October may be more comparable to current offers than prices paid last February, given the cyclical pattern of supply and demand in the market for a particular commodity.

Consider the most current available data on trends and patterns in market conditions. Remember that lags often occur between data collection and contract award. Changes in market conditions over that period can reduce the usefulness of the data assembled.

Quantity or Size. Variations in quantity can have a significant impact on unit price. A change in quantity can have an upward effect, a downward effect, or no effect at all. In supply and equipment acquisitions, we usually assume that larger supply acquisitions command lower unit prices. Where economies of scale are involved, that should be the case. However, economies of scale do not always apply.

- Increases in order size beyond a certain point may tax a supplier's capacity and result in higher prices.
- Market forces may impose opportunity costs on a supplier which result in higher unit costs for greater volumes. For example, if the price of oil is expected to increase 20 percent over a 12-month period, a supplier may choose to withhold a portion for a sale at a later date when the price is higher. In such a market, the effect of purchase quantity on price may not be as expected; at some point, increases in volume will result in higher unit prices as the supply of the lower priced oil is exhausted.
- Finally, if a price comparison is based on standard commercial items that are produced at a regular rate, variations in quantity may have no effect at all.

A meaningful comparison of prices requires that the effect of volume on price be accounted for. The best way to do this is to select prices for comparison based on equal volumes. If that is not possible, examine the specific suppliers and the nature of the market at the time of the purchase.
In service acquisitions, the issues or problems are different. Variations in size can sometimes be neutralized by reducing the comparison to price per square foot or price per productive labor hour. Because these approaches are not always effective, try to factor out size or quantity variations as much as possible. If you don't succeed, the price comparison will have little value.

Geographic Location. Geography can have a range of effects on comparability. Prices for many nationally advertised products will not vary much from place to place. Nevertheless, because geographic location can affect comparability, you should first try to compare offered prices with prices obtained from the same area. In major metropolitan centers, you should generally be able to identify comparable bases for price analysis in the region. In more remote, less urban areas, you must often get pricing information from beyond the immediate area.

When you must compare prices across geographic boundaries, take the following actions to enhance comparability.

- Check for differences in the level competition that may affect price comparisons.
- Identify labor rate differences that must be neutralized for valid price comparisons. You cannot compare labor rates for U.S. labor with similar labor of a foreign nation unless you account for the economic differences and neutralize them using a constant variable.
- Check freight requirements and accompanying costs. These can vary considerably, especially for chemicals and other hazardous materials.

Identify geographic anomalies or trends. For example, an item may be more expensive on the West Coast than in the East Coast or more localized, rent for office space within the city central business district is higher as opposed to other locations within the same city for the same type office and square footage.

Purchasing Power of the Dollar. Inflation undermines comparability by eroding the real value of money. Because prices over time are expressed in the same currency (dollars and cents), the denominations must have comparable purchasing power if comparison is to be meaningful. You can normally use price index numbers to adjust for the changing value of the dollar over time.

Extent of Competition. When comparing one price with another, assess the competitive environment shaping the prices. For example, you can compare last year's competitive price with a current offer for the same item. However, if last year's procurement was made without competition, the analyst will need to understand the terms and conditions to ensure they are not significantly different to be valid basis for comparison. A poorly written specification and an urgent need may have combined to make competition impossible last year, but now the specifications have been rewritten and the delivery is not urgent. Given these circumstances, a current offer could be the same as (or less than) last year's best price and still not be reasonable.

Terms and Conditions. The terms and conditions related to a contract include things like packaging, delivery, financing, discounts, payment terms, etc. The analysis must account for these differences prior to examining the price. This is so the analysis does not produce a premise that the price is determined unreasonable. Prices on contracts for delivery in 90 days may well be higher than those for delivery in 180 days because the contractor may have to hire additional employees or pay overtime to expedite manufacturing to meet the shorter delivery date. A requirement that is not within the normal production line lot output and delivery constraints or when the Government has other complex demands or urgent delivery requirements may cause the price to be significantly higher than usual. An example would be the Government solicits for ten widgets and demands immediate delivery prior to a full lot size of fifty being produced which may account for a full load onto a single rail car. In this instance, the contractor has to account for the special circumstances and adjust the price upward to account for taking ten widgets out of the normal production line and paying for an entire rail car. Ten widgets are 20% of the railcar capacity, but the railcar rates and any tariffs remain unchanged. The cost per widget is now increased to account for all of this. Based on the Government's requirements the contractor is proposing a price based on those conditions and therefore may be determined reasonable.

Technology. Prices from dying industries can rise because the technologies don't keep pace with rising costs. Conversely, technological advances in growth industries can drive prices down. The computer industry is an example. Technological advances have been made so fast that a comparison of prices separated by only a few weeks must account for these advances if the comparison is to have any value. Engineering or design changes must also be taken into account. This means you must identify the new or modified features and estimate their effect on price.

Government-Unique Requirements. Often, the Government's requirements vary to some degree from the
commercial requirements for similar products. The question is the impact these variations have on price. For example, the Government may require that the carpet in a Navy ship be fireproof to a far greater extent than any commercial carpet. That may justify a substantial difference in price over otherwise comparable commercial carpets.

Similarly, you must often incorporate clauses in contracts that are not required in commercial market transactions. For example, contracts between buyers and sellers in the private sector do not include provisions relating to the Davis-Bacon Act, the Service Contract Act, clean air and water, and many other special conditions. Consequently, comparison of an offer with commercial prices may be difficult. Unique terms and conditions affect prices, but it is often extremely difficult to assign a dollar value to their effects. Just as Government requirements may be different from commercial requirements, Government requirements at a specific time and place may be different than requirements at another time and place. These differences will also affect price comparisons.

### 6.3 Determining The Effect Of Identified Factors

**Introduction.** Once you have identified the factors that may affect comparability, you must determine the effect on each specific comparison with the offered price. As you determine the effect of various factors on price comparisons, you must ask yourself the following questions:

- **What factors affect this specific comparison?**
- **How do these factors affect the comparison?**
- **Does this comparison, even with its limitations, contribute to the price analysis?**

**Other Proposed Prices.** In sealed bidding, all bids are priced against the contract requirements. Comparison with competitive prices is a straightforward comparison that normally requires no adjustments unless the evaluation process involves the use of price-related factors. Comparing proposals may not be as simple as comparing bids, when:

- The offer in line for award departs from the stated solicitation requirements. If the departure does not meet stated contract requirements, but is acceptable to the Government, provide other offerors the opportunity to submit a revised proposal based on the revised requirements. However, you must not reveal any information about the proposed solution or any other offeror information entitled to protection.
- Offers differ in their basic approaches to meeting performance or functional requirements. Remember, the price of a ceramic mug is little help in determining if the price of a paper cup is reasonable, even though both can satisfy a requirement for a container that will hold eight ounces of coffee.

**Commercial Prices.** Any of the general factors identified earlier in this chapter could affect the comparability of commercial prices (i.e., market conditions may have changed since the effective date of published prices; the purchasing power of the dollar may have changed; the published prices may have been based on different terms and conditions than solicited by the Government).

During your analysis, you should give special consideration to asking how the following have affected price analysis comparisons:

- Is there a difference between the services provided commercial and Government customers? Are published prices retail, wholesale, or distributor prices?
- Is there a difference between the catalog (or suggested price) and the price paid by commercial customers with requirements similar to the Government's requirements?
- Are there different prices for different customer classes (e.g., are there different prices for different classes of customers-public vs. brokers vs. retailers?)
- What special rebates or discounts are offered commercial customers?
- Are published prices within a competitive market that have already generated sales?

What is the value of extras provided commercial customers for promotional purposes (e.g., free packaging, free transportation, free insurance, etc.) without extra charge?

**Previously Proposed Prices and Contract Prices.** Consider all general factors identified earlier in the chapter. At minimum, ask the following:

- **How have the specific changes in the contracting situation affected contract price?**

You need to understand the acquisition situation as it existed in the previous situation and how the current acquisition situation differs. Important data elements include:
How have changes in the general economic situation affected contract price?

Economic changes are reflected in the general level of inflation or deflation related to the product that you are acquiring. Have prices gone up or down. If they have, how much have they changed? Parametric and Rough Yardstick Estimates. Consider all general factors identified earlier in the chapter. In particular consider the questions above that apply to historical prices. After all pricing yardsticks are based on historical pricing information.

In addition, you must ask if the historical relationship remains valid. As a minimum, consider the following questions:

- How have changes in market conditions affected the estimating relationship?
- How have changes in technology affected the estimating relationship?
- How have changes in production efficiency affected the estimating relationship?
- How have changes in the purchasing power of the dollar affected the estimating relationship?

Independent Government Estimates. Consider all general factors identified earlier in the chapter for possible effects on comparability.

Independent Government Estimates, especially those developed previously for such purposes as preparing budgets, may no longer be valid. Budget optimism or pessimism can have a significant effect on budget estimates. In addition, many estimates are developed years before the actual contract action is initiated and may not be current. Ensure the IGE utilized in the analysis has current supporting information validating the data.

6.4 Adjusting The Prices Selected For Comparison

Introduction. If you have a price analysis comparison technique base that does not require adjustment, use it! If you must make an adjustment, try to make the adjustment as objectively as possible. You may need to use statistical techniques or algebraic formulas to establish a common basis for comparison.

You must complete two basic tasks in order to establish comparability:

- Identify and document price-related differences, taking into account the factors affecting comparability.
- Factor out price-related differences.

Restoring comparability by establishing a common basis for comparison requires that you assign a dollar value to each identified difference. However, you cannot always do this. The cost of terms and conditions peculiar to Government contracts is hard to estimate, so exercise discretion in such cases.

Other Proposed Prices. Apply any price-related factors established in the solicitation, to adjust the offered prices for comparison with one another.

Other Information. The challenge is to use the available information and to estimate the price that the Government should pay.

Use available information to estimate the effect of each factor on contract price. In this effort use appropriate quantitative analysis techniques.

If you cannot objectively adjust the prices for the factor involved, you may need to make a subjective adjustment. For example, estimating the effect on price of unique Government terms and conditions. Remember, even a subjective adjustment should have a supported basis for its unique purpose to the particular procurement.

Every acquisition situation will be different. Whatever method you use, always document the information that you used and how you used it in making the adjustment.

6.5 Comparing Adjusted Prices

Introduction. Use adjusted prices to estimate range of reasonable prices. Use the price that appears most reasonable as your should-pay price.
If the should-pay price departs significantly from the apparent successful offer, analyze the differences. You will then be ready to make the price-related decisions required to determine the successful offeror and make contract award.

Other Proposed Prices. Comparing competitive offers is normally the easiest form of price analysis. It also tends to be the most valid, because you are comparing offers prepared for the same requirement under the same market conditions within the competitive market. However, the weight placed on this type of comparison depends on the circumstances of the acquisition. Place less weight on competitive prices (relative to other price comparisons) when:

- Adequate price competition does not exist (regardless of the number of offers) - in which case the weight should be zero.
- Relatively few of the responsible firms in the industry submitted responsive offers (especially if the conditions of the solicitation unreasonably denied such firms a chance to compete).
- The apparent offeror appears to enjoy an unfair competitive advantage.
- Having used a performance or functional specification, the apparent successful offeror’s proposed approach is less comparable to other proposed approaches than (a) to work performed under prior contracts or (b) commercial contracts.
- The deliverable in line for award is less comparable to other offered deliverables than to (a) those acquired under prior contracts or to (b) commercial contracts.
- The apparent successful offer is significantly out of line (either lower or higher) with estimates of the should-pay price from other types of comparisons (to the extent that other comparisons are reliable and valid indicators of the should-pay price).
- The cost of the acquisition is substantial. The larger the dollar value of the contract, the more importance you should place on sizable differences in dollars between different types of comparisons (even if the differences are modest when expressed as percentages).

Commercial Prices. Ask the following questions to determine the weight that should be placed on comparisons with commercial prices.

- Can the offeror explain any differences between the offered price and its own commercial prices?

The offeror must be able to explain any differences between the offered price and commercial prices. You may base prices for a family of products on a single base product. For example, a radio transceiver may require different connectors and adapters to work with different systems. The part number may even be different for each system, but the basic component is the same. If the offeror can support the price of the various related products by using the price of the basic component, plus the cost of the additional devices, you can use that data to price the entire family of products.

- Is your purchase situation different from the typical commercial market situation?

Even when you grant an exception from the submission of cost or pricing data based on commercial pricing, you do not have to accept the commercial price as the contract price. If you feel that the circumstances of your purchase are different, you should attempt to negotiate a different price.

- Do other price analysis techniques bases confirm that the offered price is reasonable?

If other techniques bases indicate that the offered price is fair and reasonable, use that information in preparing your price negotiation objectives.

Previously Proposed Prices and Contract Prices. Ask the following questions to determine the weight that should be placed on comparisons with historical prices.

- How does the offered price compare with the historical prices paid, considering changes in the contracting situation?

You may be able to use quantitative techniques to adjust prices for changes in the contracting situation. If you cannot, you must subjectively analyze the changes.

- Do other types of price comparisons confirm that the offered price is reasonable?

Because of the changes in the acquisition situation, historical prices typically do not provide a precise base for determining price reasonableness. If possible, use other bases of price analysis to confirm that the offered price is fair and reasonable.

Parametric and Rough Yardstick Estimates. Ask the following questions to determine the weight that
should be placed on comparisons with parametric or rough yardstick estimates.

- **How does the offered price compare with the price developed using the pricing relationship?**

Use the appropriate price analysis technique(s) to estimate the should-pay price. Compare the offered price with the estimated price, and carefully document the techniques and the judgment you used in your analysis.

- **Do other types of price comparisons confirm that the offered price is reasonable?**

Because of item differences, pricing relationships typically cannot precisely confirm or refute price reasonableness. If possible, use other price comparisons to confirm that the offered price is fair and reasonable.

*Independent Government Estimates.* Remember that your reliance on Independent Government Estimates should always be tempered by your answers to the following questions:

- **How Was the Estimate Made?**
- **What Assumptions Were Made?**
- **What Information and Tools Were Used?**
- **Where Was the Information Obtained?**
- **How Did Previous Estimates Compare with Prices Paid?**
- **Is the IGE supported with validated information if used in the analysis?**

Place no weight on an Independent Government Estimate that originated with an offeror or is a sheer guess. It is vital to validate the basis of the IGE to ensure it was developed using realistic and relevant data that can be supported. If the Independent Government Estimate turns out to be a historical past contract price, analyze and validate the price(s) as you would any historical price. On the other hand, you might place great confidence in Independent Government Estimates built through detailed analysis - depending on how well that analysis was done.

- **7.0 - Chapter Introduction**
- **7.1 - Identifying Vendor-Related Differences**
  - 7.1.1 - Responsibility
  - 7.1.2 - Understanding Of Requirements
  - 7.1.3 - Technology
  - 7.1.4 - Efficiency
  - 7.1.5 - Strategy
  - 7.1.6 - Mistakes
- **7.2 - Identifying Market-Related Differences**
  - 7.2.1 - General Market Conditions
  - 7.2.2 - Contract Requirements

**7.0 Chapter Introduction**

*Identification and Accounting Process.* The figure below depicts the process involved in identifying and accounting for differences between the offered price and the should-pay price.
When to Account for Differences. Your price analysis should compare the offered price with available estimates of a reasonable price -- should-pay price estimates. The offered price may not be the same as any single should-pay price estimate. However, the offered price should fall within the range of should-pay estimates.

If the apparent successful offer is substantially above or below your best should-pay price estimate(s), you should attempt to account for differences. Remember that performance risk associated with a firm fixed-price that is too low may be as unacceptable as a price that is too high. In cost-reimbursement contracting, an unreasonably low cost estimate may result in a substantially higher final price, because the Government must reimburse all allowable costs.

Accounting for Differences. Accounting for differences between offered prices and should-pay estimate(s) should be part of your continuing market research during the contracting process. You should attempt to collect additional information about the apparent successful offeror or the market in general that will account for apparent differences between an offered price and should-pay price estimate(s). Then consider your findings as you make the price-related decisions identified in the next two chapters.

Based on your findings, you might eventually determine that:

- The price of the apparent successful offer is reasonable despite the identified differences;
- The price of the apparent successful offer is unreasonable;
- The differences result from problems with the solicitation or other mistakes that require solicitation cancellation; or
- Some other course of action is appropriate.

7.1 Identifying Vendor-Related Differences

Introduction. In this section, you will learn the most common vendor-related reasons for differences between the low offer, other offers, and various estimates of reasonable prices.

- 7.1.1 - Responsibility
- 7.1.2 - Understanding Of Requirements
- 7.1.3 - Technology
- 7.1.4 - Efficiency
- 7.1.5 - Strategy
- 7.1.6 - Mistakes
Vendor-Related Differences. Vendor differences are circumstances that result primarily from the action or inaction of an individual firm. Buyers often look at a source list as a homogenous group of firms. However, individual firms have personalities, just like people do, with different needs and wants. These differences manifest themselves in the prices offered, as well as in the way each firm will perform any contract awarded.

7.1.1 Responsibility
Price Analysis and Offeror Responsibility (FAR 9.103(c)). There may be a direct connection between the apparent successful offer and the firm's ability to perform. The firm's price may be very attractive because the firm does not understand the contract requirements, or because it does not have the required investment in technology and equipment to perform the contract.

Always remember that a contractor who cannot perform is never a good deal at any price. In the words of the FAR:
The award of a contract to a supplier based on lowest evaluated price alone can be false economy if there is subsequent default, late deliveries, or other unsatisfactory performance resulting in additional contractual or administrative costs. While it is important that Government purchases be made at the lowest price, this does not require an award to a supplier solely because that supplier submits the lowest offer. A prospective contractor must affirmatively demonstrate its responsibility...

Hence, if the low offer is significantly lower than other offers or your estimate of the should-pay price, the burden is on the offeror to affirm its ability to perform at that price. Anytime you find this situation, you must take affirmative action to ensure that the low price is fair and reasonable. In sealed bidding, a "mistake in bid" procedure has been established in part to provide you with an opportunity to verify that a bidder can perform at a price that is greatly out of line with other bids. In negotiated procurements, you can directly ask the offeror to affirm its ability to perform at the proposed price during discussions. When a low price is significantly lower than other offers or your should-pay price, this indicates that the low offeror may have misunderstood the requirements, that the requirements were not clear, that the low offeror has a competitive advantage over its competitors, etc.

Effect on Contract Pricing. You cannot make a determination of price reasonableness based on a price comparison with an offer that is technically unacceptable or an offer submitted by a firm that is not responsible.

7.1.2 Understanding Of Requirements
Introduction. The price offered by a firm represents the firm's understanding of the contract requirements. Even with a responsible firm and well-defined contract requirements, misunderstandings and varying interpretations are possible.

Misunderstandings. Misunderstandings are particularly likely when the solicitation contains unusual requirements that are different from what the offerors typically see in solicitations for similar requirements. The unusual requirement could be the inclusion of unique requirements or a change in requirements since the last similar contract. For example, there could be a change from a Federal Specification to a commercial purchase description for an item. Some firms may not recognize the change and continue to price based on the superseded Federal Specification. Others will recognize the change and price based on the actual solicitation requirements.

Varying Interpretations. Varying interpretations are particularly likely to occur in situations where performance requirements are used. For example, remember the "8-ounce coffee container" requirement. One offeror could interpret the requirement to mean "provide an 8-ounce ceramic mug." Another could interpret it to mean "provide an 8-ounce paper cup."

Effect on Contract Pricing. The effect of either misunderstandings or varying interpretations of specification requirements may be wide differences in prices. Not only will prices be different from each other, they may also be different from other comparison bases used for price analysis.

● Misunderstandings. A firm that does not understand that the solicitation requirements have changed will offer a price based on its expectations about the contract requirements. In the example above, a firm that continued to price based on the Federal Specification will likely offer a higher price than a firm that did identify the change to a commercial specifications.

● Varying Interpretations. A firm that devises a more costly solution to meet the requirements of a performance specification will normally offer a higher price than a firm with a less
expensive solution. In the example above, the paper cup will be substantially cheaper than the ceramic mug. However, the reasonableness of the price of the paper cup cannot be based on a competitive price comparison with the price of a ceramic mug. Comparisons with other bases for price analysis may also be complicated by similar differences in interpretation of the specification.

7.1.3 Technology

Introduction. Pricing differences may involve technology in differences related to:

- Costs associated with special technology requirements; or
- Cost patterns associated with different technologies.

Special Technology Requirements. If an offeror must have a special product or production technology to meet Government requirements, there may be an effect on contract price. Some firms may have the required technology, while others may not.

- **Product Technology.** If the product technology is within a firm's existing capabilities, it will not need to conduct expensive research and development or purchase the technology from other firms.

- **Production Technology.** If a unique production technology, required for contract performance, is currently available to a firm, it will not need to invest in new plant and equipment to perform the contract. If the technology is not available, investment, or possibly expensive subcontracting, will be required. There may also be schedule delays during the period that the firm is acquiring the new technology. Dealing with the effects of schedule delays may further increase the cost of the contract.

Different Cost Patterns Associated with Different Technologies. Differences in the cost patterns associated with different production technologies can also affect contract price. Firms can produce the same product with different types of equipment and different related costs. One firm may use a labor-intensive method of production, and, as a result, have a low fixed cost of production. Another firm might have an automated facility with high fixed costs of production and high set-up costs. For small quantities, the labor intensive firm will have the lower cost per unit. For large quantities, the automated firm will have the lower cost per unit because the fixed costs of production are spread over more units.

Effect on Contract Pricing. Technology can have a substantial effect on the prices offered by different firms:

- **Special Technology Requirements.** If costs are increased by the need to acquire a special product or production technology, prices are likely to increase because of the increased costs. If the required investment in technology has application to other products produced by the firm, the costs may be shared. If the technology requirements are unique, the costs will have to be charged to a single product.

If only one firm has access to the necessary technology, that firm may have a lock on the competition. If that happens, prices may be held at an artificially high level and expected price reductions from continuing production may not occur.

- **Different Technology Cost Patterns.** Differences in production technology may produce prices that are substantially different from what would be expected from analysis of historical prices for substantially different quantities. For smaller quantities, the labor intensive firms may have a competitive advantage. For larger quantities, the automated firm may have a competitive advantage.

7.1.4 Efficiency

Introduction. Firms with exactly the same equipment and technology can have substantially different cost structures, even when they are producing exactly the same products.

Efficiency Differences. The differences in cost structures result from operating at different levels of efficiency. Measures of efficiency examine the input, labor, materials, and equipment, required to obtain a given level of output. When compared with less efficient firms, more efficient firms can produce the same amount of product with less input, or more output with the same amount of input.

These efficiency differences are a direct result of the organization and operation of the firm. Over the past several decades, many new management theories and concepts have been developed and implemented that identify non-value-added tasks and processes. The overarching goal of these theories and concepts
is to increase efficiency thus leading to lower costs of production.

**Effect on Contract Pricing.** As stated above, efficiency is a comparison of input and output. When you examine a firm’s efficiency in producing a product, the comparison is normally made in terms of dollars per unit of output. More efficient firms can produce a product at a lower cost than less efficient competitors. A firm that is substantially more efficient than its competitors can produce a unit of a product at a substantially lower cost. If the firm can produce at a substantially lower cost, it can sell for less and still make a greater profit than its competitors.

### 7.1.5 Strategy

**Introduction.** Most firms have the same general pricing objectives, to:

- Cover costs;
- Contribute to attaining corporate operational objectives.

However, different firms have different pricing strategies. And pricing strategies within a single firm can change with changes in the product and the market situation.

**Strategies.** Some offerors pursue **cost-based pricing strategies** and others pursue **market-based pricing strategies**. A single firm may follow different pricing strategies in different acquisition situations. Three cost-based and seven market-based pricing strategies are described in detail in the text.

**Effect on Contract Pricing.** Firms pursuing different pricing strategies may offer different prices, even when they have essentially the same production costs. As a result, you should consider differences between these strategies as you analyze price differences.

Be particularly careful if you believe that the apparent successful offeror's pricing strategy involves pricing the contract below cost. The Comptroller General has repeatedly dismissed protests against alleged below-cost, buy-in offers. In one case, the Comptroller General noted that a “bidder, for various reasons, in its business judgment may decide to submit a below-cost bid; such a bid is not invalid. Whether the awardee can perform the contract at the price offered is a matter of responsibility.”

Hence, when confronted with what appears to be a buy-in price, your challenge is to determine whether the price represents an unacceptable performance risk (i.e., to judge the degree of risk by calculating the extent to which the proposed price falls short of the amount the agency believes is required to perform as proposed).

### 7.1.6 Mistakes

**Introduction.** Like individuals, businesses, even major corporations, are not perfect, and can make mistakes.

**Types of Mistakes.** You have already considered one form of mistake as part of your consideration of offeror understanding of the Government requirement. In pricing, you may also see mistakes that involve simple mathematical errors. The more complex the task, the more opportunity there is for error.

Mathematical mistakes may occur, even when prices are prepared by computer. Computers only do what they are programmed to do. If the programming is incorrect, the answer will also be incorrect.

**Effect on Contract Pricing.** Even a simple mathematical error can have a significant effect on contract pricing. Pricing is usually the last step in offer development. In the pressure to submit the offer, the mistake may be missed by the offeror’s review process.

**For example:** A construction task requires remodeling of 20 identical buildings. The bidder estimates the price for one building and multiplies the price by 2 instead of 20. The bid price is one-tenth what the estimator meant it to be.

### 7.2 Identifying Market-Related Differences

**Introduction.** In this section, you will learn about the most common market-related reasons for differences between the low offer, other offers, and various estimates of reasonable prices.

- **7.2.1 - General Market Conditions**
- **7.2.2 - Contract Requirements**

**Market-Related Differences.** Market-related differences are circumstances that are beyond the control of an individual firm and that affect all firms, but not always in the same way. Just like vendor differences, market differences can also affect price comparisons.
7.2.1 General Market Conditions

Introduction. A general market condition is any factor that affects the general industry conditions under which products are bought and sold.

Differences in General Market Conditions. Consider changes in the contracting situation and in general economic conditions, whenever you are using historical prices as a comparison base for determining price reasonableness.

Three circumstances are worthy of special consideration:

- Changes in the level of competition;
- Limited competition and collusion; and
- Differing economic conditions.

Changes in the Level of Competition. Changes in the level of competition can affect offeror pricing strategies. If competition decreases from historical levels, firms typically will be less concerned about the threat of price competition. If the level of competition increases, firms will be more concerned.

Limited Competition and Collusion. In Government contracting, you normally assume that you have adequate price competition whenever there are two or more sources. However, you must be careful in assuming competition, particularly in situations where there are only two or three firms that can meet Government requirements.

Limited competition encourages collusion. Any agreement or mutual understanding among competing firms that restrains the natural market forces should be considered collusion. The understanding does not have to be the result of an active agreement. It can be a passive understanding that aggressive competition will lower profit margins for all competitors without increasing volume for any single competitor. As long as each firm gets its "fair share" of the business, all the firms can increase profit by not competing aggressively.

You may find it is often difficult to detect collusion and antitrust law violations. Practices or events that may evidence violation of antitrust laws include (FAR 3.303(c)):

- The existence of an "industry price list" or "price agreement" to which contractors refer when formulating offers.
- A sudden change from competitive bidding to identical bidding.
- Simultaneous price increases or follow-the-leader pricing.
- Rotation of offers or proposals, so that each competitor takes a turn in sequence as low offeror, or so that certain competitors submit low offers on some sizes of contracts and high on other sizes.
- Division of the market, so that certain competitors only offer low prices for contracts let by certain agencies, or for contracts in certain geographical areas, or on certain products, and offer high prices on all other contracts.
- Establishment by competitors of a collusive price estimating system.
- The filing of a joint bid by two or more competitors when at least one of the competitors has sufficient technical capability and productive capacity for contract performance.
- Any incidents suggesting direct collusion among competitors, such as the appearance of identical calculation or spelling errors in two or more competitive offers or the submission by one firm of offers for other firms.
- Assertions by the employees, former employees, or competitors of offerors, that an agreement to restrain trade exists.

Differing Economic Conditions. A firm can have a competitive advantage because of the economic conditions in the area in which it operates. Expect production costs to be different in different parts of the country. You may be able to use index numbers to consider the effect that different area costs will have on contract price.

Effect on Contract Pricing. General market conditions can have a substantial effect on prices:

- **Changes in the Level of Competition.** Changes in the level of competition will affect the accuracy of price estimates based on historical prices. As firms become less concerned about competition, prices may be expected to increase faster than national averages. As firms become more concerned about competition, price increases may be slower than national averages.
- **Limited Competition and Collusion.** Collusion, active or passive, will increase prices.
Carefully review any of the practices or events that may indicate evidence of violation of the antitrust law. Some events such as certain competitors being low only for contracts let by certain agencies, or for contracts in certain geographical areas, or on certain products, and high on all other jobs, may have economic explanations other than collusion. If your review confirms collusion, you should report your conclusions to the U.S. Department of Justice.

- **Differing Economic Conditions.** Differences in the area economic conditions can have a significant effect on production costs, including labor rates and material costs. Depressed economic conditions (e.g., high local unemployment rates) in an area can lower costs. Depressed sales can make suppliers more willing to cut prices to make a sale. Lower labor and material costs will permit a firm to produce a product more cheaply than its competitors operating in areas with better general economic conditions.

### 7.2.2 Contract Requirements

**Introduction.** Contract requirements include more than just product requirements. They include any element of the solicitation or contract that defines what the contractor must do to complete the contract successfully. Changes in requirements and defective requirements can both affect price analysis comparisons.

**Defective Requirements.** The different elements of the solicitation/contract are termed defective when they do not adequately describe contract requirements. A contract should define, **who, what, when, where, and how** for any task that must be performed under the contract. If the contract is not clear, or the requirements are open to interpretation, widely different interpretations may result. If contract terms conflict, the contract may be impossible to perform.

**Changes in Contract Requirements.** Changes in contract terms can be particularly important when you use historical prices as a comparison base to determine price reasonableness. Changes in type of contract, f.o.b. point, delivery requirements, quantities, and other terms can affect the contractor's cost and risk.

**Effect on Contract Pricing.** Contract requirements have a substantial effect on contract pricing:

- **Defective Requirements.** If requirements are unclear or conflict, firms may attempt to guess what the Government really wants. Some may underestimate, and others may overestimate actual requirements. The result may be a wide range of prices, depending on the interpretation of the individual offeror.

Some firms may even attempt to "game" the offer by assuming the lowest requirement possible in the belief that a contract change will be required to correct the conflict. Remember, judges normally interpret disputes over contract ambiguities and conflicts against the writer of the contract. In Government contracting, the Government writes the contract.

- **Requirements Changes.** Any element that will affect contractor cost or risk will also affect contract price. Changes from historical contract terms that increase cost or risk should increase price. Changes from historical terms that decrease cost or risk should decrease contract price.

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### 8.0 Chapter Introduction

**Introduction (FAR 14.404-1 and FAR 14.404-2).** To maintain the integrity of sealed bidding as a method of procurement, you must award to that responsible bidder which submitted the lowest responsive bid, as determined by applying the IFB’s price-related factors. However, this general rule does not hold if you have reason to believe that the low bid is:

The result of a mistake by the bidder, materially unbalanced, or otherwise unreasonable as to price.

**Price-Related Decision Process.** The figure below depicts the process involved in making price-related
decisions in sealed bidding.

8.1 Examine Individual Bids
This section covers the following topics:
- 8.1.1 - Suspected Mistakes In Bids
- 8.1.2 - Unbalanced Bids

8.1.1 Suspected Mistakes In Bids
Unexpectedly Low Bids (FAR 14.404-2(f)). What if the low bid is well below all other bids? What if the low bid is well below your estimate of the should-pay price? The FAR states that "any bid may be rejected if the contracting officer determines in writing that it is unreasonable as to price. Unreasonableness of price includes not only the total price of the bid, but the prices for individual line items as well." To determine
whether an unexpectedly low bid is unreasonable, use the FAR "mistake in bid" procedure. 

Examining Bids for Mistakes (FAR 14.407). After the bid opening, examine all bids for mistakes. Look for two kinds of mistakes:

- Apparent clerical errors; and
- Other indications of error -- such as a bid price that is far out of line with other bids or with the dollar amount determined by the contracting officer to be reasonable.

If you suspect that the bidder has erred, request verification of the bid from the bidder. This is your opportunity to talk with (and even meet) the bidder to find out why the bid price is so low. The bidder may, at this point, admit to having made a mistake in preparing the bid. Or the bidder may stand by the bid price. In either case, the burden of proof is on the bidder.

Correcting Apparent Clerical Mistakes (FAR 14.407-2). When you examine bids, you may spot a clerical error apparent on the face of the bid. Examples of apparent clerical errors:

- Obvious misplacement of a decimal point.
- Obviously incorrect discounts (e.g., 1% 10 days, 2% 20 days, 5% 30 days).
- Obvious reversal of the price f.o.b. origin, and the price f.o.b. destination.

The contracting officer may correct, before award, any clerical error which is apparent on the face of the bid. Follow this 3-step process:

1. Ask the bidder to verify the intended bid.
2. Attach the bidder's verification to the original bid and a copy of the verification to the duplicate bid.
3. Reflect the corrected price in the award document.

Other Suspected or Alleged Mistakes (FAR 14.407-3(g)(1)). If you suspect that the bidder made a less obvious mistake, such as grossly underestimating the cost of doing the work, immediately ask the bidder to verify the bid. Your action must be sufficient to reasonably assure that the bid is correct or to elicit an admission of a mistake by the bidder.

To put a bidder on notice of the suspected mistake, advise the bidder, as appropriate:

- That its bid is so much lower than the other bids or the Government's estimate as to indicate the possibility of error.
- Of important or unusual characteristics associated with the Government requirements,
- Changes in the requirements from those of previous acquisitions, or
- Any other information, proper for disclosure, that leads you to suspect a mistake.

After you have raised the possibility of a mistake to the bidder, the bidder may take one of three courses of action:

- Allege that a mistake was made and request permission to correct the mistake.
- Allege that a mistake was made and request permission to withdraw the bid.
- Verify the original bid.

Clear and Convincing Evidence (FAR 14.407-3(g)(2)). If a bidder alleges that a mistake was made, the bidder must submit a written request to withdraw or modify the bid supported by statements (sworn, if possible) and by clear and convincing evidence of the mistake.

What constitutes clear and convincing evidence?

All pertinent evidence establishing the existence of the error, the manner in which it occurred, and the bid actually intended. Examples of such evidence include:

- The bidder's file copy of the bid.
- The original work sheets and other data used in preparing the bid.
- Subcontractors' quotations, if any.
- Published price lists.

Determine the Reasonableness of a Low Bid. Bid verification gives you the opportunity to investigate the reasons for a bid that is "far out of line" with other bids or your should-pay estimate. Reject such a bid when the evidence supports a finding that the bidder is nonresponsible, misunderstands the requirement, or has underestimated the costs and risks of performance. Accept the bid when the evidence establishes that the bidder can ably perform at the price bid (e.g., because the bidder is the most efficient performer or has knowingly submitted a below-cost bid and has the financial reserves to cover probable losses). You may have to cancel the IFB if your investigation uncovers a Government mistake (e.g., a defective requirement).
8.1.2 Unbalanced Bids

Identify Unbalanced Pricing (FAR 14.404-2(g) and FAR 15.404-1(g)). Analyze all bids with separately priced line items or subline items to determine if prices are unbalanced. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly over or understated as indicated by application of cost or price analysis techniques.

Consider Risk to the Government. Whenever you identify unbalance pricing, you must consider the probability that award to the bidder with the unbalanced price will:
- Increase contract performance risk; or
- Result in payment of unreasonably high prices.

The risk is normally greatest when:
- Startup work, mobilization, first articles, or first article testing are separate line items;
- Base quantities and option quantities are separate line items; or
- The evaluated price is the aggregate of estimated quantities to be ordered under separate line items of an indefinite-quantity contract.

Reject Bids with Unacceptable Risk. You may reject a bid if the contracting officer determines that the lack of balance poses an unacceptable risk to the Government. Such bids are generally described as materially unbalanced. A bid is materially unbalanced if it is mathematically unbalanced and one of the following is true:
- There is reasonable doubt that the lowest evaluated bid will actually result in the lowest cost to the Government.
- The offer is so grossly unbalanced that its acceptance would be tantamount to allowing an advanced payment.

A bid is mathematically unbalanced if it is based on prices that are significantly less than cost for some line items and significantly more than cost for other line items.

Identification of Materially Unbalanced Bids. In sealed bidding, you must normally use price analysis to determine if bids are materially unbalanced. For example, you could use the following price analysis comparisons to determine if bid prices for a contract requiring both first article testing and production are materially unbalanced:
- Compare all bids to determine if the structure of any bid differs significantly from the structure of other bids concerning the pricing for first articles and production units. (Does one bid contain a first article price that is significantly greater than other bids, while production units are significantly cheaper?)
- Compare the production unit price with the price of similar production units.
- Compare the difference between the first article price and the production unit price, with the price differences experienced between first article and production units on contracts for similar items.
- Compare the difference between the first article price and the production unit price, with the Independent Government Estimate of the price of first article test effort, excluding the price of the units required for test.
- Compare the price for the first article and the price for production units with the Independent Government Estimates.

Document Analysis of Unbalanced Bids. Carefully document your analysis of bids that appear to be materially unbalanced. This documentation will form the basis for any determinations and Government actions.
- If analysis supports a determination that unbalanced pricing poses an unacceptable risk to the Government, the documentation will serve as a basis for rejecting the bid.
- If analysis shows that the risk is acceptable, the documentation will provide information on the facts as they were considered during analysis.

8.2 Determine Need To Cancel The IFB

- 8.2.1 - Price-Related Reasons For Canceling The IFB
- 8.2.2 - Negotiation After Cancellation
8.2.1 Price-Related Reasons For Canceling The IFB

Reasons for Canceling IFBs (FAR 14.404-1(b) and FAR 14.404-1(c)). FAR 14.404-1(c) provides ten possible reasons for canceling an invitation for bid (IFB) after bid opening. Five of ten, shown below are clearly pricing-related. Other reasons for cancellation (e.g., cancellation clearly in the public interest) could also be related to pricing concerns.

Pricing related factors from FAR 14.404-1(c)
(4) The invitation did not provide for consideration of all factors of cost to the Government, such as cost of transporting Government-furnished property to bidders’ plants;
(5) Bids received indicate that the needs of the Government can be satisfied by a less expensive article differing from that for which the bids were invited;
(6) All otherwise acceptable bids received are at unreasonable prices, or only one bid is received and the contracting officer cannot determine the reasonableness of the bid price;
(7) The bids were not independently arrived at in open competition, were collusive, or were submitted in bad faith;
(9) A cost comparison as prescribed in OMB Circular A-76 and [FAR] Subpart 7.3 shows that performance by the Government is more economical;

Situations Requiring Cancellation (FAR 14.404-1(b)&(c)). The following table summarizes the five price-related reasons for canceling the solicitation after bid opening, how to avoid each situation and analyze it when it occurs.

<table>
<thead>
<tr>
<th>Possible Cancellation Situation</th>
<th>Avoiding the Situation</th>
<th>Analyzing the Situation When It Occurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFB Did Not Consider All Factors of Cost</td>
<td>In earlier chapters, you learned about selecting and applying price-related factors in making the award decision. In preparing a solicitation, you should consider those principles. Doing so should help you avoid most situations in which you must cancel an IFB for failing to properly consider all factors of cost to the Government. During the solicitation period, you must be alert to price-related factors that are not considered in the solicitation. Carefully review comments and questions received from potential bidders to identify such factors.</td>
<td>In price analysis, you must apply the price-related factors included in the award criteria. During your analysis, you must be alert to identifying price-related factors that were not properly considered in developing the award criteria and to identifying important price-related factors that were not considered at all.</td>
</tr>
<tr>
<td>Government Needs Can Be Satisfied with Less Expensive Product</td>
<td>Establish a best estimate of price or value as part of acquisition planning. In that process, you should carefully review the purchase request estimate, analyze market data and acquisition histories, and identify and collect other related pricing data. During that review, you must be alert to alternative products that will meet Government needs at a lower total cost. If you identify a lower priced product, coordinate with the requiring activity to assure that the product is acceptable. If it is, assure that the solicitation is modified to permit bidders to furnish the product identified. Develop solicitations that:</td>
<td>During your efforts to determine price reasonableness, you should consider pricing yardsticks and cost estimating relationships based on the prices of similar items. You may also request Government technical personnel to perform a visual or value analysis. Analysis could identify a product, other than the product for which bids were solicited, that will meet Government requirements at a lower price. Review the impact of the specification on bids, bearing in</td>
</tr>
<tr>
<td>Table Title</td>
<td>Description</td>
<td>Additional Information</td>
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<td>------------------------</td>
</tr>
<tr>
<td>Maximizes competition; Maximizes use of commercial products; and Eliminates unnecessary costs. During the solicitation period, you must be alert to alternative products.</td>
<td>mind that revising the specification can be a reason for canceling the solicitation.</td>
<td></td>
</tr>
<tr>
<td>Unacceptable Prices for Otherwise Acceptable Bids</td>
<td>Maximize price competition. Efforts such as source development, proper selection of business terms, and appropriate publicizing of the purchase should maximize price competition. Adequate price competition should encourage bidders to submit fair and reasonable prices.</td>
<td>Analyze significant differences between different estimates of price reasonableness and between the estimates and actual prices. Both vendor differences and market differences must be carefully explored before you determine that a price is so unacceptably high as to justify cancellation.</td>
</tr>
<tr>
<td>Bids Not Arrived at Independently</td>
<td>Encourage independent bid development. Take special care to avoid brand name purchase descriptions and contract requirements that require all bidders to use a key component or technology controlled by one of the competitors. Such requirements make independent bid development a practical impossibility. During the solicitation period, be alert to potential bidder comments concerning specifications that will restrict independent competition.</td>
<td>Earlier in the text, you learned about practices and events that indicate collusive practices and potential antitrust violations. You also learned about the importance of thorough review before making any allegation of collusive practices.</td>
</tr>
<tr>
<td>More Economical Government Performance (FAR 7.3 and FAR 52.207-1)</td>
<td>The Government is always a potential competitor to perform required services. If you have reason to believe that the bid price will be higher than the cost of Government performance, request that Government personnel prepare a cost estimate and include the FAR Notice of Cost Comparison (Sealed-Bid), in the IFB. This action will put potential bidders on notice that the requirement may be performed in-house and encourage price competition.</td>
<td>If a cost estimate has been prepared and the appropriate notices included in the IFB: Open the cost comparison form containing the Government performance cost estimate at the time of bid opening. After evaluation of bids and determination of low bidder responsibility, provide the low bid price to the organization that prepared the Independent Government Estimate for final cost comparison. Provide cost comparison results to the agency authority responsible for deciding between Government and contract performance. If the cost estimate has not been prepared under FAR requirements and the appropriate notices have not been included in the IFB, the</td>
</tr>
</tbody>
</table>
solicitation cannot be formally compared with the cost of Government performance. The contract price must still be determined reasonable based on other bases of price analysis. If the price cannot be determined to be reasonable, consider canceling the solicitation based on unreasonable prices. If you believe that Government performance would be more economical, schedule the requirement for a formal cost comparison.

**Decision to Cancel the Invitation.** In some circumstances, when you are determining if the invitation should be canceled, you will need to consider the relative advantages and disadvantages to the Government. In other circumstances, the pricing concern is so great that you should cancel the solicitation whenever the situation is confirmed to exist.

<table>
<thead>
<tr>
<th>Possible Cancellation Situation</th>
<th>Recommend Invitation Cancellation If ...</th>
</tr>
</thead>
</table>
| IFB Did Not Consider All Factors of Cost | One of the following statements about the IFB is true:  
  - It did not consider all price-related factors, or  
  - It did not properly consider all price-related factors  
  **AND**  
  The lack of proper consideration will affect selection of the successful bidder,  
  **AND**  
  The anticipated total cost to the Government for canceling the solicitation and soliciting new bids with revised award criteria is less than the cost for proceeding with award under the current award criteria. |
| Government Needs Can be Satisfied with Less Expensive Product | An alternative product will satisfy the needs of the Government at a lower price,  
  **AND**  
  The total cost to the Government for canceling the solicitation and resolicitation is less than the cost for proceeding with award under the current award criteria. |
| Unacceptable Prices for Otherwise Acceptable Bids | The Government's requirement can be deferred,  
  **OR**  
  There is reason to believe that canceling and resoliciting or negotiating would result in an acceptable price \(^1\) |
| Bids Not Arrived at Independently | Available information demonstrates that bids were not arrived at independently. |
| More Economical Government Performance ([FAR 7.3, FAR 7.305, and OMB Circ A-76](#)) | The cost estimate for Government performance was prepared prior to bid opening,  
  **AND**  
  The appropriate notices were included in the solicitation,  
  **AND**  
  Cost comparison demonstrates sufficient savings, to warrant in-house Government performance,  
  **AND** |
Because you expect demand to decline relative to supply, or you expect to reenter the market at a more favorable point in the cycle, or you have plans for source development, or you plan to resolicit under business terms and conditions which are more in keeping with market norms, etc.

**Document Your Decision.** Whenever you consider an invitation cancellation, you should document your analysis and decision process. Documentation is essential to support the decision by the agency head, or delegated official, to cancel an invitation for bids. Documentation is also necessary when a determination is made not to cancel the solicitation. Buyers will later be able to use the information provided in acquisition planning to prevent similar situations and possible solicitation cancellations.

### 8.2.2 Negotiation After Cancellation

*Introduction.* Negotiation after IFB cancellation is authorized in two of the situations where the invitation may be canceled for pricing-related reasons. To use negotiations to complete the sealed-bid acquisition, the agency head, or delegated official, must determine that the invitation is to be canceled and that the use of negotiations is appropriate to complete the acquisition.

**Possible Cancellation Situations (FAR 14.404-1(e) and DFARS 214.404-1).** The table below identifies five possible cancellation situations and describes whether acquisition through negotiation is authorized after IFB cancellation.

<table>
<thead>
<tr>
<th>Possible Cancellation Situation</th>
<th>Is completion of the Acquisition through Negotiation Authorized after IFB Cancellation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFB Did Not Consider All Factors of Cost</td>
<td>No, acquisition completion through negotiation is not authorized. Proceed with a new acquisition.</td>
</tr>
<tr>
<td>Government Needs Can be Satisfied with Less Expensive Product</td>
<td>No, acquisition completion through negotiation is not authorized. Proceed with a new acquisition.</td>
</tr>
<tr>
<td>Unacceptable Prices for Otherwise Acceptable Bids</td>
<td>Yes, if authorized by the agency head, or delegated official, in the determination to cancel the IFB.</td>
</tr>
<tr>
<td>Bids Not Arrived at Independently</td>
<td>Yes, if authorized by the agency head, or delegated official, in the determination to cancel the IFB.</td>
</tr>
<tr>
<td>More Economical Government Performance</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

*Make Award without Issuing a New Solicitation (FAR 14.404-1(f)).* When the agency head has determined that the IFB should be canceled and that the use of negotiations is in the Government's interest, the contracting officer may award the contract without issuing a new solicitation, provided:

- Each responsible bidder in the sealed bid acquisition has been given notice that negotiations will be conducted and has been given an opportunity to participate in the negotiations; and
- The award is made to the responsible bidder offering the lowest negotiated price.
9.0 Introduction

Price-Related Decision Process. The figure below depicts the process involved in making price-related decisions in negotiation.

9.1 Determine The Need For Cost Information

The contracting officer must obtain the minimum amount of data required to determine a fair and reasonable price for the acquisition. That information may come from internal government sources, market sources, or the offeror. The amount of the supporting data required, and the source of that data,
will depend upon the acquisition situation. 

Requiring Cost or Pricing Data (FAR 15.403, and FAR Table 15-2 at FAR 15.403-8). You have already learned that you:

- MUST NOT REQUIRE cost or pricing data when an exception applies.
- MUST REQUIRE an offeror to submit cost or pricing data for non-competitive contract actions over the cost or pricing data threshold, when no exception applies.
- MAY REQUIRE an offeror to submit cost or pricing data for acquisitions below the cost or pricing data threshold but over the simplified acquisition threshold, when no exception applies and you have approval from the head of the contracting activity.

When you require cost or pricing data, the data should meet the general requirements of FAR Table 15-2. Table 15.2 addresses the types of data that the contractor should disclose to the government in support of the proposed price. The contractor will need to certify to any of that data if it meets the definition of cost or pricing data. Depending on the situation, the contracting officer may require data submission in:

- The format prescribed by Table 15-2;
- Another format prescribed by the contracting officer; or
- A format selected by the offeror.

Requiring Information Other Than Cost or Pricing Data (FAR 15.403-3 and FAR 15.403-5(b)). For noncompetitive acquisitions where the price is not set by law or regulation, information other than cost or pricing data submitted must include appropriate information on the prices at which the same or similar items have been sold that is adequate to support price analysis. Requirements for cost information should be limited to specific areas of concern (e.g., the cost of high-cost material items or information related to differences between similar items).

Permit offerors to submit information other than cost or pricing data in a format selected by the offeror, unless the contracting officer decides that a specific format is essential.

9.2 Determine The Need For Discussions

When Not to Conduct Discussions with Offerors (FAR 15.209(a)(1) and FAR 52.215-1(f)(4)). The standard FAR instructions to offerors for competitive acquisitions notify offerors that the Government intends to evaluate proposals and award a contract without discussions. As the contracting officer, you must determine the need for negotiations. Do not conduct discussions with offerors unless they are necessary to identify the proposal that offers the best value to the Government based on the offer evaluation criteria. For example, do not conduct discussions to squeeze lower prices from offerors when initial offers appear fair and reasonable.

If offerors know that award is likely to occur without negotiations, they will be encouraged to submit better offers initially. If they know that you will always negotiate, they may wait until your request for a final proposal revision (FPR) to submit a truly competitive price. Many offerors actually distrust the security of the competitive negotiation process and fear that their price will leak to competitors.

When to Conduct Discussions with Offerors (FAR 15.209(a)(1) and FAR 52.215-1 Alt 1). If the solicitation instructions to offerors notified offerors that the Government intends to evaluate proposals and award a contract after conducting discussions with offerors in the competitive range, you must conduct discussions.

If the solicitation instructions to offerors notified offerors that the Government intends to evaluate proposals and award a contract without discussions, you may conduct discussions if the contracting officer determines that discussions are necessary and documents the rationale for that decision in the contract file. Generally, the contracting officer should only consider such a determination when there is a question about which proposal truly offers the best value to the Government. For example, negotiations might be necessary to resolve concerns about the cost realism of a proposal that appears substantially under priced.

Clarifications and Award without Discussions (FAR 15.306(a) and FAR 14.407-2(a)). Clarifications are limited exchanges, between the Government and offerors, that may occur when award without discussions is contemplated.

When award will be made without conducting discussions, you may give offerors an opportunity to clarify:

- Certain proposal aspects (e.g., the relevance of an offeror's past performance information and adverse past performance information to which the offeror has not previously had an opportunity to respond); or
Apparent minor or clerical errors. Examples of minor or clerical errors include, but are not limited to:

- Obvious misplacement of a decimal point;
- Obviously incorrect discounts (e.g., 1 percent, 20 days, 5 percent, 30 days);
- Obvious reversal of the price f.o.b. destination and price f.o.b. origin; or
- Obvious mistake in designation of the unit.

Carefully document any proposal aspects or apparent errors requiring clarification and the actions taken to clarify the proposal. If any clarification would prejudice the interest of another offeror, you should conduct discussions with all offerors in the competitive range.

9.3 Determine The Competitive Range

**Competitive Range (FAR 15.306(c)).** Once you make the decision to negotiate, you must determine which firms will participate in discussions.

Identify firms to be included in the competitive range by evaluating each offer against the evaluation criteria enumerated in the solicitation.

- Establish a competitive range comprised of all the most highly rated proposals, unless the competitive range is further limited for purposes of efficiency.
- If the solicitation provides that the competitive range can be limited for purposes of efficiency, the contracting officer may determine that the number of most highly rated proposals that might otherwise be included in the competitive range exceeds the number at which an efficient competition can be conducted. Then the contracting officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

**Steps for Determining the Competitive Range (FAR 15.306(c)).** When you determine the competitive range, you should follow these steps:

1. **Evaluate All Proposals.** Evaluate all proposals considering all award criteria (price and technical) established in the solicitation.
2. **Identify Evaluation Score Groupings.** Identify the grouping, or arrangement, of evaluation scores for all proposals. This may be done by arranging the proposals from highest to lowest score and then looking for breaks in the scores such that natural groupings of similar scores may be identified.
3. **Identify the Most Highly Rated Proposals.** Look for breaks in the evaluation ratings that separate the most highly rated proposals from the others. Identify the most highly rated proposals for possible inclusion in the competitive range. If all proposals are tightly grouped, you could include all proposals as highly rated. However, you must exclude proposals that are not highly rated.
4. **Determine Whether To Limit The Competitive Range.** When permitted by the solicitation, the contracting officer may determine to limit the number of most highly rated proposals that might otherwise be included in the competitive range to support more efficient competition. This determination should depend on the number of offerors initially included in the competitive range and the issues involved in the competitive discussions. For example, it may be possible to efficiently conduct discussions with 20 offerors if the issues are relatively simple. When complex issues are involved, efficient competition may require limiting the competitive range to five firms or less. The number of firms actually included should not be set arbitrarily (e.g., to five), but should be set after an evaluation of the proposal ratings and the complexity of the issues involved in the discussions.
5. **Notify Unsuccessful Offerors.** You must notify an unsuccessful offeror in writing as soon as practical after determining that the proposal is no longer eligible for award.

**Consider Price Reasonableness (FAR 15.305(a) and FAR 15.306(c)).** As you evaluate proposals to establish the competitive range, consider price reasonableness based on your should-pay price estimate(s). However, remember that price **may [is] only be** one element in the proposal evaluation criteria.

**Consider Cost Realism (FAR 15.404-1(d)).** You must consider cost realism in evaluating proposal for any cost-reimbursement contract. For these contracts, your analysis should center on developing an estimate...
of most probable cost. Remember that, for these contracts, final price will depend on final cost. An unrealistically low proposal could result in an unrealistically high final contract price. You may consider cost realism in evaluating proposals for fixed-price contracts, particularly fixed-price incentive contracts. For these contracts, your analysis should center on evaluating the performance risk associated with an unrealistically low price. Proposed prices must not be adjusted, because the final contract price is either firm or limited on price.

**Evaluation Practices to Avoid.** When determining the competitive range, you should not:

- Establish arbitrary limits on the competitive range based on comparisons with the proposal with the most favorable evaluation. For example, do not arbitrarily determine that all proposals with prices within 20 percent of the most favorably evaluated proposal will be included in the competitive range and all others excluded.
- Establish arbitrary limits on the competitive range based on the Independent Government Estimate or a preset evaluation score.
- Include any proposal in the competitive range if it is not among the most highly rated.

### 9.4 Determine The Need For Prenegotiation Exchanges

**Prenegotiation Exchanges (FAR 15.306).** Prenegotiation exchanges include any dialogue between the Government and the contractor after proposal receipt and prior to contract negotiation. The Government objective is to identify and obtain available contractor information needed to complete proposal analysis. In addition, most types of prenegotiation exchanges also provide the contractor an opportunity to seek clarification of the Government's stated contract requirements.

**Information Already Available.** As you determine the need for a prenegotiation exchange, consider the information already available, including:

- The solicitation, unilateral contract modification, or any other document that instigated the contractor's proposal;
- The proposal and all information submitted by the contractor to support the proposal;
- Information from your market research concerning the product, the market, and any relevant acquisition history;
- Any relevant field pricing or audit analyses;
- In-house technical analyses; and
- Your initial analysis of the proposed price and, where appropriate, specific elements of cost.

**Clarifications (FAR 15.306(a)).** Clarifications are limited exchanges, between the Government and contractors, that may occur when the Government contemplates a contract award without discussions. Remember that award may only be made without discussions when the solicitation states that the Government intends to evaluate proposals and make award without discussions. Consider giving one or more contractors the opportunity to clarify certain aspects of proposals that may have an effect on the award decision. For example, a request for clarification might give the contractor an opportunity to:

- Clarify the relevance of a contractor's past performance information;
- Respond to adverse past performance information if the contractor has not previously had an opportunity to respond; or
- Resolve minor or clerical errors, such as:
  - Obvious misplacement of a decimal point in the proposed price;
  - Obviously incorrect prompt payment discount;
  - Obvious reversal of price f.o.b. destination and f.o.b. origin; or
  - Obvious error in designation of the product unit.

**Communications (FAR 15.306(b)).** Communications are exchanges, between the Government and contractors, after receipt of proposals, leading to establishment of the competitive range. Communications with a contractor are only authorized when the contractor is not clearly in or clearly out of the competitive range. Specifically, communications:

- Must be held with contractors whose past performance information is the determining factor preventing them from being placed within the competitive range. Such communications must address adverse past performance information to which the contractor has not had a prior
opportunity to respond.

- May be held with other contractors whose exclusion from, or inclusion in, the competitive range is uncertain. They may be used to:
  - Enhance Government understanding of the proposal;
  - Allow reasonable interpretation of the proposal; or
  - Facilitate the Government's evaluation process.
- Must not be held with any contractor not in one of the situations described above.

The purpose of communications is to address issues that must be explored to determine whether a proposal should be placed in the competitive range.

- Use communications to address any adverse past performance information to which the contractor has not previously had an opportunity to comment.
- You may use communications to address:
  - Ambiguities in the proposal or other concerns (e.g., perceived deficiencies, weaknesses, errors, omissions, or mistakes); and
  - Information relating to relevant past performance.
- You must not use communications to permit the contractor to:
  - Cure proposal deficiencies or material omissions;
  - Materially alter the technical or cost elements of the proposal; and/or
  - Otherwise revise the proposal.

Exchanges After Establishment of the Competitive Range. You should normally not need to conduct any exchanges after establishment of the competitive range but before negotiations. Proposals included in the competitive range should be adequate for negotiation. However, there may be situations when you need additional information to prepare reasonable negotiation objectives.

The purpose of such exchanges is to obtain additional information for proposal analysis and to eliminate misunderstandings or erroneous assumptions that could impede objective development. Never use this type of exchange to give a contractor an opportunity to modify its proposal.

Fact-Finding (FAR 15.406-1). In a noncompetitive procurement, fact-finding may be necessary when information available is not adequate for proposal evaluation. It will most often be needed when:

- The proposal submitted by the contractor appears to be incomplete, inconsistent, ambiguous, or otherwise questionable; and
- Information available from market analysis and other sources does not provide enough additional information to complete the analysis.

The purpose of fact-finding is to obtain a clear understanding of the contractor's proposal, Government requirements, and any alternatives proposed by the contractor. Typically, fact-finding centers on:

- Analyzing the actual cost of performing similar tasks. This analysis should include such issues as whether:
  - Cost or pricing data are accurate, complete, and current;
  - Historical costs are reasonable; or
  - Historical information was properly considered in estimate development.
- Analyzing the assumptions and judgments related to contract cost or performance, such as:
  - The reasonableness of using initial production lot direct labor hours and improvement curve analysis to estimate follow-on contract labor hours;
  - Projected labor-rate increases; or
  - Anticipated design, production, or delivery schedule problems.

9.5 Establish Pre-Negotiation Price Positions

This section covers the following topics:

- 9.5.1 - Analyze Risk
- 9.5.2 - Develop Negotiation Positions

Prenegotiation Objectives (FAR 15.406-1(a)). Prenegotiation objectives establish the Government's initial negotiation position and assist in determining whether a price is fair and reasonable. They should be based on the results of proposal analysis, taking into consideration all pertinent information including:
Field pricing assistance;
- Audit reports;
- Technical analyses;
- Fact-finding results;
- Independent Government Estimates; and
- Price histories.

In addition to your price objective, your prenegotiation positions should also consider the range of reasonable prices around that objective.

### 9.5.1 Analyze Risk

**Risk in Pricing.** As you begin to develop your price negotiation positions, you must analyze the risk involved. The acquisition may be the 99th acquisition of a standard commercial item or it may be the first acquisition of complex state-of-the-art equipment manufactured to precise Government specifications. Acquisition of the standard commercial item may involve little pricing risk. You have price histories, commercial item price comparisons, and competition. All will likely lead you to the same should-pay price or very similar should-pay prices.

The state-of-the-art item will likely have a much higher level of pricing risk. You may have only the Independent Government Estimate. Commercial items may permit only very general comparisons. These different price estimates may lead you to a wide range of prices that appear reasonable.

**Risk Assessment and Should-Pay Prices.** You must begin to estimate should-pay prices when you begin acquisition planning, and you should continue to refine your estimate as information is collected throughout the acquisition process. Use judgment in evaluating the reliability of each estimate when developing the total estimate of the price the Government should pay.

**Judgment in Risk Assessment.** It is likely that, given the same data, buyers and sellers will develop different judgments on which price is most reasonable. These judgments will be based on different perspectives and different assessments of the risk involved. Sellers are concerned about being able to complete contracts, cover costs, and make a profit. Buyers are concerned about their customer's needs, contract completion, budgets limitations, fairness to all offerors, and the public perception of their actions.

### 9.5.2 Develop Negotiation Positions

**Price Positions in Noncompetitive Negotiations.** In noncompetitive negotiations, you should define the range of reasonable prices using three pricing positions. These positions should be based on your should-pay estimates developed during the acquisition process. As you prepare these positions, remember that:

- **The minimum price position** should be your starting place in negotiations and your first offer. Never offer a price that cannot be supported by reasoned analysis.
- **The objective (or target) price position** should be the price that you think is most reasonable, based on your analysis of the reliability of different price estimates. It should be the price that you think the Government should pay.
- **The maximum price position** should be the highest price that you can reasonably accept, given the information you have at the beginning of negotiations. The maximum price may change during negotiations if additional information is presented by the offeror that changes the situation.

Both parties to a negotiation expect movement by the other party. If you offer one price throughout the negotiation, you may appear inflexible and that appearance could jeopardize agreement. Different positions also provide you with an opportunity to collect information needed to understand the offeror's perspective on a reasonable price, and to sell the reasonableness of your negotiation positions.

**Price Positions in Competitive Discussions** (FAR 15.306(d)). Before entering into competitive discussions, develop separate minimum, objective, and maximum positions for each proposal. Use these positions in identifying the strengths, weaknesses, deficiencies, and uncertainties in the offeror's proposal. As you prepare these positions, remember that they will be used to advise the offeror of deficiencies in its proposal so that the offeror is given an opportunity to improve its proposal.

- Include your reasons (if any) for believing that the offeror's pricing is deficient based on comparisons with historical prices, commercial prices, parametric estimates, rough yardstick
estimates, or the Independent Government Estimate.

● Be prepared to point out any indicators that the proposed price is too high or too low. Remember that you will not be able to engage in offers and counteroffers during discussions. The offeror must determine how to modify its proposal in order to increase the value offered.

9.6 Consider Potential Trade-Offs Between Price And Other Terms

Introduction (FAR 15.206). The price positions described in the last section should be based on the requirements stated in the original solicitation, unless Government requirements changed after proposals were received. If requirements have changed, all offerors must be notified of the change. Requirement Changes In noncompetitive negotiations, all elements of the contract are subject to negotiated change during the negotiation process. In preparing for such negotiations, you should identify any changes in terms and conditions that you are willing to trade for certain related changes in price. The potential requirements changes could be either additions or deletions. The potential price changes should correspond with the value to the Government of the change in technical requirements. A technical requirements increase should result in a higher price objective, while technical requirements decrease should result in a lower price objective. A change in requirements that is neither an increase or decrease in overall technical requirements should result in no change to the price objective.

In competitive discussions, you must not change minimum contract requirements unless all offerors remaining in the competitive range have an opportunity to revise their proposal based on the change. If the proposed change is so substantial that additional sources would likely have submitted offers had the amendment been known, the contracting officer must cancel the solicitation. You must obtain approval from appropriate Government technical personnel before suggesting or agreeing to any change in technical requirements. As you and the appropriate Government technical personnel agree on requirements changes that you would be willing to consider, develop an estimate of the related objective price change.

Format for Analyzing Potential Tradeoffs. The following chart provides a format for analyzing potential tradeoffs during negotiations. A data page containing the type of information described below will greatly speed negotiations and enable you to concentrate on the important issues involved.

<table>
<thead>
<tr>
<th>Type Of Change In Requirements</th>
<th>Related Objective Increase</th>
<th>Related Objective Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Requirements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspection and Acceptance Terms:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery or Performance Terms:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract Type:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socioeconomic Terms:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payment Terms:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Furnished Property:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranties:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patents and Rights in Data:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Terms and Conditions:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.7 Determine The Need To Cancel And Resolicit

Authority to Reject All Proposals (FAR 15.303(a) and FAR 15.305(b)). The source selection authority may reject all proposals received in response to a solicitation, if doing so is in the best interests of the
Government. The source selection authority is the contracting officer unless the agency head appoints another individual for a particular acquisition or group of acquisitions.

Examples of Reasons to Reject All Proposals
Consider canceling and resoliciting anytime that you expect such action will increase competition or reduce cost to the Government.

Common price-related reasons for canceling a solicitation include the following:

- All otherwise acceptable proposals have unreasonable prices.
- Proposals were not independently priced.
- A cost comparison shows that in-house performance by the Government is more economical.

Pricing concerns may also lead the contracting officer to cancel a solicitation based on the potential for increased competition or cost savings.

Volume 2 – Quantitative Techniques for Contract Pricing
1.0 Introduction
In this chapter, you will learn to use price index numbers to make the price adjustments necessary to analyze price and cost information collected over time.

Price Index Numbers. Price index numbers measure relative price changes from one time period to another. They are so widely used that discussions related to index numbers in contract pricing normally refers to price indexes. However, other index numbers could be used in contract pricing, particularly indexes that measure productivity.

Simple and Aggregate Price Index Numbers. Price index numbers can indicate price changes for one or several related supplies or services over a period of time. The Bureau of Labor Statistics (BLS) publishes numerous simple and aggregate Producer Price Indexes (PPI) that track changes in the wholesale price of products sold in the United States.

- Simple index numbers calculate price changes for a single item over time. Index numbers are more accurate if they are constructed using actual prices paid for a single commodity, product or service rather than the more general aggregated index. An example of a simple index would be one that tracks only lemons or oranges.
- Aggregate index numbers calculate price changes for a group of related items over time. An example of an aggregate price index would be one that tracks citrus fruits.

1.1 Identifying Situations For Use
Situations for Use. You can use price index numbers to:

- Inflate/deflate prices or costs for direct comparison. You can use price index numbers to estimate/analyze product price/cost today using the price/cost of the same or a similar product in the past.
- Inflate/deflate prices or costs to facilitate trend analysis. You can use index numbers to facilitate trend or time series analysis of prices/costs by eliminating or reducing the effects of inflation so that the analysis can be made in constant-year dollars (dollars free of changes related to inflation/deflation).
- Estimate project price or cost over the period of contract performance. Prices/costs of future performance are not certain. One effect that you must consider is the changing value of the dollar. You can use index numbers to estimate and negotiate future costs and prices.
- Adjust contract price or cost for inflation/deflation. When price/cost changes are particularly volatile, you may need to include an Economic Price Adjustment (EPA) clause in the contract. The use of index numbers is one of the most popular methods used to identify and define price changes for economic price adjustment.

1.2 Constructing Price Index Numbers
Steps in Price Index Number Development. If your activity repeatedly buys the same types of services or supplies, consider developing your own price indices to track trends in price over time. This section will demonstrate the procedures for developing a simple price index. To develop an aggregate index, follow the same basic steps using data from the various products selected for index development.

There are four steps to developing a simple price index number:
Step 1. Collect data for each period.
Step 2. Select an appropriate base period.
Step 3. Divide each period price by the base-period price.
Step 4. Multiply by 100 to produce an index number.

Example of Price Index Number Development.

Step 1. Collect Data for Each Period. For each index period, collect average price data for the product, commodity, or service. For example, assume the following average yearly prices for a hoist:

<table>
<thead>
<tr>
<th>Year</th>
<th>20X4</th>
<th>20X5</th>
<th>20X6</th>
<th>20X7</th>
<th>20X8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$84.12</td>
<td>$90.84</td>
<td>$95.06</td>
<td>$101.97</td>
<td>$107.32</td>
</tr>
</tbody>
</table>

Step 2. Select an Appropriate Base Period. Select a base period appropriate for the data available. In this case, we will use the 20X4 price, $84.12.

<table>
<thead>
<tr>
<th>Select Base Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>Year</td>
</tr>
<tr>
<td>20X4</td>
</tr>
<tr>
<td>20X5</td>
</tr>
<tr>
<td>20X6</td>
</tr>
<tr>
<td>20X7</td>
</tr>
<tr>
<td>20X8</td>
</tr>
</tbody>
</table>

Step 3. Divide each period price by the base-period price. In this example, divide each period price (Column B) by the base-period price (Column C). The result is a price relative (Column E) as shown below. A price relative is the relationship of the price in any period to the base period price. For example, the table below shows that the price in 20X6 is 1.13 times or 13 percent higher than the price in 20X4.

<table>
<thead>
<tr>
<th>Calculate Price Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>Year</td>
</tr>
<tr>
<td>20X4</td>
</tr>
<tr>
<td>20X5</td>
</tr>
<tr>
<td>20X6</td>
</tr>
<tr>
<td>20X7</td>
</tr>
</tbody>
</table>
1.276

Step 4. Convert to an Index Number. Convert to an index number (Column F) by multiplying each price relative (Column E) by 100. Normally, you should round index numbers to the nearest tenth.

### Calculate Price Index

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Average Annual Price</td>
<td>20X4 Base Price</td>
<td>Price Relative Calculation</td>
<td>Price Relative</td>
<td>Index Number</td>
</tr>
<tr>
<td>20X4</td>
<td>$84.12</td>
<td>$84.12</td>
<td>$84.12 / $84.12</td>
<td>1.000</td>
<td>100.0</td>
</tr>
<tr>
<td>20X5</td>
<td>$90.84</td>
<td>$84.12</td>
<td>$90.84 / $84.12</td>
<td>1.080</td>
<td>108.0</td>
</tr>
<tr>
<td>20X6</td>
<td>$95.06</td>
<td>$84.12</td>
<td>$95.06 / $84.12</td>
<td>1.130</td>
<td>113.0</td>
</tr>
<tr>
<td>20X7</td>
<td>$101.97</td>
<td>$84.12</td>
<td>$101.97 / $84.12</td>
<td>1.212</td>
<td>121.2</td>
</tr>
<tr>
<td>20X8</td>
<td>$107.32</td>
<td>$84.12</td>
<td>$107.32 / $84.12</td>
<td>1.276</td>
<td>127.6</td>
</tr>
</tbody>
</table>

### 1.3 Selecting A Price Index For Analysis

Points to Consider in Index Selection. Use published indexes carefully as they often do not fit the pattern of price changes for the product or service you are analyzing. The data usually represent national or regional averages in lieu of any specific contractor or location. Nevertheless, price index numbers offer a practical alternative to the costly and time-consuming task of developing index numbers from basic cost data.

When you use published indexes, choose the index series that best fits your specific analysis effort. Usually, the closer the chosen index series relates to the item you are pricing, the more useful the number will be in your analysis.

If you are buying a finished good, indices representing raw materials and purchased components may not necessarily provide an accurate basis for projecting prices. The finished good price may also be strongly influenced by trends in direct labor, cost of capital, etc. Accuracy can be improved by the use of a weighted average index which represents changes in both labor and material elements of price. Many contracting organizations develop weighted average indexes for major products or major groups of products.

Sources of Published Indexes. You may not have the time or data required to develop the price indexes that you need for a price or cost analysis. Fortunately, there are many sources of previously constructed price indexes that you can use to estimate price changes. These sources include:

- Bureau of Labor Statistics (BLS);
- Other Government agencies;
- Government contracting organizations;
- Commercial forecasting firms;
- Industry or trade publications; and
Indexes from the Bureau of Labor Statistics. The Government collects and publishes vast amounts of data on prices. Four of the best known sources of index numbers are published by the BLS:

- **Producer Price Index Detailed Report.** Probably the best known and most frequently used source of price index numbers for material pricing is the [Producer Price Index (PPI) Detailed Report](https://data.bls.gov/PPI/) published monthly by the [U.S. Department of Labor, Bureau of Labor Statistics (BLS)](https://www.bls.gov/). The indexes report monthly price changes at the producer/wholesale level for 15 major commodity groups:

<table>
<thead>
<tr>
<th>Commodity Code</th>
<th>Commodity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Farm Products</td>
</tr>
<tr>
<td>02</td>
<td>Processed Foods and Feeds</td>
</tr>
<tr>
<td>03</td>
<td>Textile Products and Apparel</td>
</tr>
<tr>
<td>04</td>
<td>Hides, Skins, Leather, and Related Products</td>
</tr>
<tr>
<td>05</td>
<td>Fuels and Related Products and Power</td>
</tr>
<tr>
<td>06</td>
<td>Chemicals and Allied Products</td>
</tr>
<tr>
<td>07</td>
<td>Rubber and Plastic Products</td>
</tr>
<tr>
<td>08</td>
<td>Lumber and Wood Products</td>
</tr>
<tr>
<td>09</td>
<td>Pulp, Paper, and Allied Products</td>
</tr>
<tr>
<td>10</td>
<td>Metals and Metal Products</td>
</tr>
<tr>
<td>11</td>
<td>Machinery and Equipment</td>
</tr>
<tr>
<td>12</td>
<td>Furniture and Household Durables</td>
</tr>
<tr>
<td>13</td>
<td>Nonmetallic Mineral Products</td>
</tr>
<tr>
<td>14</td>
<td>Transportation Equipment</td>
</tr>
<tr>
<td>15</td>
<td>Miscellaneous Products</td>
</tr>
</tbody>
</table>

- **Consumer Price Index Detailed Report.** The consumer price index (CPI), published monthly in the [Consumer Price Index Detailed Report](https://www.bls.gov/cpi/), reports on changes in consumer prices for a fixed mix of goods selected from the following categories:
  - Food;
  - Clothing;
  - Shelter and fuels;
  - Transportation; and
  - Medical services.

You should normally not use the CPI in adjusting material prices because the CPI reflects retail rather than wholesale price changes. However, the CPI can be of value in pricing services when labor rate
increases are linked to changes in the CPI.

- Monthly Labor Review. The Monthly Labor Review includes selected data from a number of Government indexes, including:
  - Employment Cost Index;
  - Consumer Price Index;
  - Producer Price Indexes;
  - Export Price Indexes; and
  - Import Price Indexes.

The data and other information presented in the publication can prove useful in analyzing prices, especially on service contracts, where direct labor is a significant part of contract price.

- Employment Cost Index. The Employment Cost Index presents information on the changes in earnings index for various classes of labor. Like the Monthly Labor Review, the report can be very useful in pricing contracts in which direct labor is a significant part of the contract price.

Indexes from Other Government Agencies. Data on contract prices are also available from agencies other than the BLS, such as the Federal Reserve System and the Bureau of Economic Analysis.

- Federal Reserve System. The Board of Governors publishes the Federal Reserve Bulletin, which includes economic indexes and data on business, commodity prices, construction, labor, manufacturing, and wholesale trade. Each bank in the system publishes information each month with special reference to its own Federal Reserve District.

- Bureau of Economic Analysis Publications. The Bureau of Economic Analysis, Department of Commerce, publishes the Survey of Current Business that provides general information on trends in industry and the business outlook. It furnishes economic indexes on business, construction, manufacturing, and wholesale trade.

- Indexes from Government Contracting Organizations. Many Government contracting organizations have teams of analysts who develop indexes that are particularly applicable to the organizations' specific contracting situations. These indexes may be developed from raw price data, or they may be developed as weighted averages of published indexes.

Indexes from Commercial Forecasting Firms. Numerous commercial indexes are available for use in contract price analysis. While most Government indexes only report historical price changes, many commercial indexes also forecast future price movement. In situations where forecasts are necessary, commercial indexes may prove particularly useful. Before using such indexes, examine their development and consult with auditors, technical personnel, and other contracting professionals to assure they are applicable in your analysis situation. Many federal government departments/agencies have contracts with commercial firms that provide these economic forecasting services. Check with your department or agency to see if you have access to such a service.

Indexes from Industry or Trade Publications. Industry and trade publications frequently provide general forecasts of economic conditions and price changes anticipated in the industry. To identify which publications have economic information relevant to a particular product, ask Government technical personnel. Contractors can also assist you in the identification of appropriate publications. However, be sure to verify with Government personnel the appropriateness of any information sources recommended by a contractor.

Indexes from Newspapers. Publications, such as local, national, and financial newspapers, provide valuable forecasts of price changes in specific industries. The information reported is normally data provided by the Government, economic forecasting firms, or industry groups.

1.4 Adjusting Price/Cost For Analysis

In this section, you will learn how to use price index numbers to adjust prices and costs for analysis.

- 1.4.1 - Adjusting Price/Cost for Pricing Comparisons
- 1.4.2 - Adjusting Price/Cost For Further Analysis

Compensating for Inflation or Deflation. The changing value of the dollar can complicate comparisons and other analyses using price or cost information collected over time. You can use price indexes to adjust prices/costs to compensate for inflation or deflation to facilitate direct comparisons and further analysis.

Calculate Relative Price Change Between Two Periods. Index numbers indicate the percentage change
in price relative to the base year. For example, the table below shows that the average product price increased by 23.2 percent between 20X4 and 20X9.

<table>
<thead>
<tr>
<th>Year</th>
<th>Product Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>20X4</td>
<td>100.0</td>
</tr>
<tr>
<td>20X5</td>
<td>105.3</td>
</tr>
<tr>
<td>20X6</td>
<td>112.0</td>
</tr>
<tr>
<td>20X7</td>
<td>116.5</td>
</tr>
<tr>
<td>20X8</td>
<td>119.3</td>
</tr>
<tr>
<td>20X9</td>
<td>123.2</td>
</tr>
</tbody>
</table>

To adjust prices for inflation or deflation, you must be able to do more than determine how prices have changed relative to the base year. You must be able to determine how prices changed between any two time periods. For example, looking at the table above, how did prices change between 20X6 and 20X9? To calculate the percentage price change between any two time periods, you must follow the same procedure that you would follow if you had actual price data; you must divide.

\[
\text{Index in 20X9} \div \text{Index in 20X6} = \frac{123.2}{112.0} = 1.10
\]

Based on the price index and this calculation, you could estimate that product prices in 20X9 were 1.10 times the prices in 20X6 or 10.0 percent more than the prices in 20X6.

**Estimating Price/Cost Using Index Numbers.** You can use index numbers to adjust prices or costs from any time period for inflation or deflation. For example, the calculation above demonstrated that product prices increased 10.0 percent between 20X6 and 20X9. If you knew that the price for an equipment item in 20X6 was $1,000, you could estimate that the price should be 10.0 percent higher in 20X9. That would result in a price estimate of $1,100 for 20X9.

These calculations can be formalized into a simple equation using either the Ratio Method or the Price Adjustment Formula Method described below.

- **Ratio Method.** The Ratio Method uses an equation in the form of a simple ratio to make the price adjustment.

\[
I_2 \div I_1 = P_2 \div P_1
\]

Where:
- \(I_1\) = Index in Time Period 1 -- the index for the period for which you have historical cost/price information.
- \(I_2\) = Index in Time Period 2 -- the index for the period for which you are estimating.
- \(P_1\) = Price/cost in Time Period 1 -- historical cost/price information.
- \(P_2\) = Price/cost in Time Period 2 -- cost/price estimate.

Example: You purchased an item in 20X6 for $1,000 and you are trying to estimate the price in 20X9. The relevant index in 20X6 was 112.0. In 20X9, it is 123.2.

\[
\frac{I_2}{I_1} = \frac{P_2}{P_1}
\]

\[
123.2 \div 112.0 = P_2 \div 1,000
\]

\[
123.2 \times 1,000 = 112.0 \times P_2
\]

\[
123,200 = 112.0 \times P_2
\]

\[
123,200 \div 112.0 = P_2
\]

\[
1,100 = P_2
\]

- **Price Adjustment Formula Method.** The Price Adjustment Formula is a simplification of
the Ratio Method described above.

\[ P_2 = \frac{I_2}{I_1} \times P_1 \]

Example: The calculations below use the same pricing information used above to demonstrate the ratio method.

\[ P_2 = \frac{123.2}{112.0} \times 1000 \]

\[ = 1.10 \times 1000 \]

\[ = 1100 \]

Adjustment Period Selection. When adjusting historical prices for inflation, take care in selecting the period of adjustment. There are two basic methods you can use in adjusting costs/prices:

- Adjustment based on period between acquisition dates.
  - This is the method most commonly used to calculate the period of price adjustment, because acquisition dates are readily available.
  - For example: An item is being acquired in January 20X2 was last purchased in January 20X1. Using this method, the logical adjustment period would be January 20X1 to January 20X2 -- a year of inflation or deflation.

- Adjustment based on period between delivery dates.
  - If delivery schedules are similar, this method should be satisfactory. However, if delivery schedules are significantly different, you may be over or under the adjustment required.
  - For example: If the January 20X1 acquisition provided for delivery in January 20X2 and the January 20X2 acquisition also provided for delivery in January 20X2, allowing for a year of inflation or deflation would likely overestimate the adjustment required. The pricing of the first acquisition should have already considered the anticipated price changes between January 20X1 and January 20X2. Why make a second adjustment for the same price changes?

1.4.1 Adjusting Price/Cost For Pricing Comparisons

Should-Pay Estimates. You can use price indexes to develop should-pay estimates of current price or cost based on historical information. These should-pay estimates can be used for a variety of purposes including comparison with an offered price or cost as part of an evaluation of reasonableness.

Steps in Using Price Indexes to Analyze Price/Cost Reasonableness. To perform this analysis, follow the steps below:

- Step 1. Collect available price/cost data.
- Step 2. Select a price index for adjusting price/cost data.
- Step 3. Adjust price/cost for inflation/deflation.
- Step 4. Use adjusted price/cost for pricing comparisons.

Example of Using Price Indexes to Analyze Price/Cost Reasonableness. Consider the problem of analyzing a contractor’s proposed price of $23,000 for a turret lathe to be delivered in 20X8.
Step 1. Collect available price/cost data. A procurement history file reveals that the same machine tool was purchased in 20X4 at a price of $18,500. Determine whether the 20X8 proposed price is reasonable.

Step 2. Select a price index for adjusting price/cost data. Select or construct an appropriate index. In this case, you might select a Machinery and Equipment Index as a reasonable indicator of price movement for a turret lathe. You could extract the data from a Government publication (e.g., the PPI) or use a similar commercial index.

<table>
<thead>
<tr>
<th>Year</th>
<th>Machinery and Equipment Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>20X2</td>
<td>100.0</td>
</tr>
<tr>
<td>20X3</td>
<td>103.3</td>
</tr>
<tr>
<td>20X4</td>
<td>106.0</td>
</tr>
<tr>
<td>20X6</td>
<td>110.8</td>
</tr>
<tr>
<td>20X7</td>
<td>115.0</td>
</tr>
<tr>
<td>20X8</td>
<td>121.9</td>
</tr>
</tbody>
</table>

Step 3. Adjust price/cost for inflation/deflation. After you have selected an index, you can adjust prices to a common dollar value level. In this case, you would normally adjust the historical 20X4 price to the 20X8 dollar value level. To make the adjustment, you simply use one of the methods already demonstrated.

Using the Ratio Method.

\[ \frac{I2}{I1} = \frac{P2}{P1} \]

\[ \frac{121.9}{106.0} = Price \ Estimate \ for \ 20X8 \div 18,500 \]

\[ 121.9 \times 18,500 = 106.0 \times P2 \]

\[ 2,255,150 = 106.0 \times P2 \]

\[ P2 = 21,275 \]

Using the Formula Adjustment Method.

\[ P2 = \frac{I2 \times P1}{I1} \]

\[ = \frac{121.9 \times 18,500}{106.0} \]

\[ = 1.15 \times 18,500 \]

\[ = 21,275 \]

Step 4. Use adjusted price/cost for pricing comparisons. Once you have made the adjustment for inflation/deflation, you can compare the offered and historical prices in constant dollars. The offered price/cost is $23,000, but the adjusted historical price/cost is only $21,275. Thus, the offered price/cost is $1,725, or 8.1 percent higher than what you would expect, given the historical data and available price indexes.

If you look at the percentage price/cost change between the two acquisitions, the difference is even more pronounced. Using the price indexes, you projected an increase from $18,500 to $21,275, or 15.0 percent. The offer increase was from $18,500 to $23,000, or about 24.3 percent. In this case, you might ask the offeror why the price/cost rose at a rate 62 percent higher than anticipated (24.3 is 62 percent larger than 15.0).

Do not attempt to determine whether a price or cost is reasonable based on this type of analysis alone. You must consider the entire contracting situation, including any differences in quantity, quality, delivery requirements, or other contract terms that might significantly affect price. However, the above analysis does raise concern about the reasonableness of the offer.

Note that the analysis above is based on 4-year old data. You should generally place less reliance on a comparison utilizing 4-year old data than you place on a comparison based on more current data.
1.4.2 Adjusting Price/Cost For Further Analysis

Inflation/Deflation May Obscure Trends. Often you will make a series of similar acquisitions over a period of time. Pricing trends may develop but they may be obscured by inflation/deflation. Adjusting prices for inflation/deflation will make it possible to more accurately identify and track these trends.

Steps in Using Price Indexes to Analyze Price/Cost Reasonableness. Adjustment for further analysis follows four steps similar to those used for data adjustment that are applied in preparation for direct comparison. The major difference is that several elements of cost/price data must be adjusted to a single time period. After adjustment, data is said to be in constant-year dollars.
Step 1. Collect available price/cost data.
Step 2. Select price indexes for adjusting price/cost data.
Step 3. Adjust prices/costs for inflation/deflation.
Step 4. Apply appropriate analysis technique(s).

Example of Using Price Indexes to Adjust Prices/Costs for Further Analysis. To illustrate this analysis, consider an offer of $22,500 each for five precision presses in 20X7.

Step 1. Collect Available Price/Cost Data. The organization has purchased five similar presses each year since 20X2. The historical unit prices are shown in Column D of the table below. While purchase quantity changes are not present in this situation, unit prices are used to limit the effect of quantity differences on trend analysis. In this case, the only apparent cost/price trend in the unadjusted data are the increasing prices.
Step 2. Select Price Indexes For Adjusting Price/Cost Data. Again, the Machinery and Equipment Index will be used. Annual indexes are presented in Column B of the table below.
Step 3. Adjust Prices/Costs For Inflation/Deflation. The adjustment calculation is presented in Column C of the table below. Each historical price is adjusted to an equivalent price in 20X7 dollars.

<table>
<thead>
<tr>
<th>Adjustment For Further Analysis</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td></td>
<td></td>
<td>Mach</td>
<td>ine</td>
<td>y and Equipment Index</td>
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Step 4. Apply appropriate analysis technique(s). After the historical unit prices are adjusted to 20X7 dollars, a trend becomes obvious. In 20X7 dollars, prices have been dropping $200 each year since 20X2. The obvious price estimate is $20,200 for the 20X7 acquisition. That projection is based on the continuation of the historical trend. However, as with direct comparison, analysis based on historical price trends must consider any changes in the contracting situation and their possible affect on contract price. There may also be questions as to what has caused the trend and whether those forces will continue to cause price changes.

Most trends are not so obvious, even after prices have been adjusted to constant-year dollars. However, you can often apply techniques such as regression analysis or improvement curve analysis to identify clear estimating relationships.

1.5 Identifying Issues And Concerns

Questions to Consider in Analysis. As you perform price/cost analysis, consider the issues and concerns identified in this section, whenever your analysis is based on data collected over time.

- Were prices/costs collected over time adjusted for inflation/deflation?
  Inflation/deflation can mask underlying price changes. Price indexes should be used to more accurately identify and track any pricing trends.

- Is it reasonable to use the price index series selected?
  The price index series selected for making the price/cost adjustment should be as closely related to the item being considered as possible. For example, you should not use the Consumer Price Index to adjust for changes in the price of complex industrial electronic equipment.

- Are adjustments calculated correctly?
  Anyone can make a mistake in calculation. Assure that all adjustments are made correctly.

- Is the time period for the adjustment reasonable?
  When adjusting historical prices for inflation, take care in selecting the period of adjustment. There are two basic methods that are used in adjusting costs/prices, period between acquisition dates and the period between delivery dates. The period between acquisition dates is most commonly used because purchase dates are typically more readily available. However, be careful if delivery schedules are
substantially different.

- Is more than one adjustment made for the same inflation/deflation?
  For example, it is common for offerors to adjust supplier quotes to consider inflation/deflation between the
time when the quote was obtained and the date that the product will be required. This is acceptable
unless the supplier already considered the inflation/deflation in making the quote.
- How far into the future can you forecast?
  You can forecast any period into the future as long as you have a reasonable index estimate. However,
the price forecast risk increases as the risk of developing a reasonable index estimate increases. The
farther into the future that you forecast, the greater the risk that the economic factors affecting the index
will change.

2.0 Chapter Introduction
In this chapter, you will learn to use cost-volume-profit analysis.
Assumptions. When you acquire supplies or services, you normally expect to pay a smaller price per unit
as the purchase quantity increases. You expect contractors to have lower costs per unit as production
quantity increases. This general expectation remains the same whether you are buying items specifically
built for the Government or items that are mass-produced for a variety of commercial and Government
customers. You can use cost-volume-profit analysis to analyze the natural relationship between cost,
volume, and profit in pricing decisions. In cost-volume-profit analysis, you:
- Should consider only short-term operations. The short term may be defined as a period
too short to permit facilities expansion or contraction or other changes that might affect overall
pricing relationships.
- Assume that a straight line can reasonably be used in analysis. While actual price
behavior may not follow a straight line, its use can closely approximate actual cost behavior in the
short run.
  - If purchase volume moves outside the relevant range of the available data, the straight-
    line assumption and the accuracy of estimates become questionable.
  - If you know that product variable costs per unit are decreasing as quantity increases,
    consider using the log-linear improvement curve concept. Improvement curves are
    particularly useful in limited production situations where you can obtain cost/price
    information for all units sold.

Types of Cost. In the short run, costs can be of three general types:
- **Fixed Cost.** Total fixed costs remain constant as volume varies in the relevant range of
  production. Fixed cost per unit decreases as the cost is spread over an increasing number of units.
  **Examples include:** Fire insurance, depreciation, facility rent, and property taxes.
- **Variable Cost.** Variable cost per unit remains constant no matter how many units are
  made in the relevant range of production. Total variable cost increases as the number of units
  increases.
  **Examples include:** Production material and labor. If no units are made, neither cost is necessary or
  incurred. However, each unit produced requires production material and labor.
- **Semi-variable Cost.** Semi-variable costs include both fixed and variable cost elements.
  Costs may increase in steps or increase relatively smoothly from a fixed base.
  **Examples include:** Supervision and utilities, such as electricity, gas, and telephone. Supervision costs
tend to increase in steps as a supervisor's span of control is reached. Utilities typically have a minimum
service fee, with costs increasing relatively smoothly as more of the utility is used.

*Graphic Depiction of Cost Behavior.* The four graphs below illustrate the different types of cost behavior
described above:
Profit. Profit is the difference between total cost and revenue. In cost-volume-profit analysis, a loss is expressed as a negative profit. Breaking even, which is neither profit nor loss, is a profit of zero dollars.

2.1 Identifying Situations For Use

Situations for Use. Cost-volume-profit analysis is an estimating concept that can be used in a variety of pricing situations. You can use the cost-volume relationship for:

- **Evaluating item price in price analysis.** Cost-volume-profit analysis assumes that total cost is composed of fixed and variable elements. This assumption can be used to explain price changes as well as cost changes. As the volume being acquired increases unit costs decline. As unit costs decline, the vendor can reduce prices and same make the same profit per unit.
- **Evaluating direct costs in pricing new contracts.** Quantity differences will often affect
direct costs -- particularly direct material cost. Direct material requirements often include a fixed component for development or production operation set-up. As that direct cost is spread over an increasing volume unit costs should decline.

- **Evaluating direct costs in pricing contract changes.** How will an increase in contract effort increase contract price? Some costs will increase while others will not. The concepts of cost-volume-profit analysis can be an invaluable aid in considering the effect of the change on contract price.

- **Evaluating indirect costs.** The principles of cost-volume-profit analysis can be used in indirect cost analysis. Many indirect costs are fixed or semi-variable. As overall volume increases, indirect cost rates typically decline because fixed costs are spread over an increasing production volume.

### 2.2 Analyzing The Cost-Volume Relationship

This section examines algebraic and graphic analysis of the cost-volume relationship.

- **2.2.1 - Algebraic Analysis**
- **2.2.2 - Graphic Analysis**

#### 2.2.1 Algebraic Analysis

**Key Assumption.** The assumption of linear cost behavior permits use of straight-line graphs and simple linear algebra in cost-volume analysis.

**Calculating Total Cost Algebraically.** Total cost is a semi-variable cost-some costs are fixed, some costs are variable, and others are semi-variable. In analysis, the fixed component of a semi-variable cost can be treated like any other fixed cost. The variable component can be treated like any other variable cost. As a result, we can say that:

\[
\text{Total Cost} = \text{Fixed Cost} + \text{Variable Cost}
\]

Using symbols:

\[
C = F + V
\]

Where:

- \(C\) = Total cost
- \(F\) = Fixed cost
- \(V\) = Variable cost

Total variable cost depends on two elements:

- Variable Cost = Variable Cost per Unit x Volume Produced

Using symbols:

\[
V = V_U (Q)
\]

Where:

- \(V_U\) = Variable cost per unit
- \(Q\) = Quantity (volume) produced

Substituting this variable cost information into the basic total cost equation, we have the equation used in cost-volume analysis:

\[
C = F + V_U (Q)
\]

**Example of Calculating Total Cost Algebraically.** If you know that fixed costs are $500, variable cost per unit is $10, and the volume produced is 1,000 units, you can calculate the total cost of production.

\[
C = F + V_U (Q)
\]

\[
= $500 + $10 (1,000)
\]

\[
= $500 + $10,000
\]

\[
= $10,500
\]

**Example of Calculating Variable Cost Algebraically.** Given total cost and volume for two different levels of production, and using the straight-line assumption, you can calculate variable cost per unit.

**Remember that:**

- Fixed costs do NOT change no matter what the volume, as long as production remains within the relevant range of available cost information. Any change in total cost is the result of a change in total variable cost.
- Variable cost per unit does NOT change in the relevant range of production.
As a result, we can calculate variable cost per unit (\( V_U \)) using the following equation:

\[ V_U = \frac{\text{Change in Total Cost}}{\text{Change in Volume}} \]

or

\[ V_U = \frac{(C_2 - C_1)}{(Q_2 - Q_1)} \]

Where:

- \( C_1 \) = Total cost for Quantity 1
- \( C_2 \) = Total cost for Quantity 2
- \( Q_1 \) = Quantity 1
- \( Q_2 \) = Quantity 2

You are analyzing an offeror's cost proposal. As part of the proposal the offeror shows that a supplier offered 5,000 units of a key part for $60,000. The same quote offered 4,000 units for $50,000. What is the apparent variable cost per unit?

\[
V_U = \frac{(C_2 - C_1)}{(Q_2 - Q_1)} \\
= \frac{($60,000 - $50,000)}{(5,000 - 4,000)} \\
= $10,000 - $1,000 \\
= $10
\]

**Example of Calculating Fixed Cost Algebraically.** If you know total cost and variable cost per unit for any quantity, you can calculate fixed cost using the basic total cost equation.

You are analyzing an offeror's cost proposal. As part of the proposal the offeror shows that a supplier offered 5,000 units of a key part for $60,000. The apparent variable cost is $10 per unit. What is the apparent fixed cost?

\[
C = F + V_U (Q) \\
$60,000 = F + $10 (5,000) \\
$60,000 - $50,000 = F \\
$10,000 = F
\]

**Developing an Estimating Equation.** Now that you know that \( V_U \) is $10 and \( F \) is $10,000 you can substitute the values into the general total cost equation.

\[
C = F + V_U (Q) \\
= $10,000 + $10 (Q)
\]

You can use this equation to estimate the total cost of any volume in the relevant range between 4,000 and 5,000 units.

**Using the Estimating Equation.** Using the estimating equation for the relevant range, estimate the total cost of 4,400 units.

\[
C = $10,000 + $10 (Q) \\
= $10,000 + $10 (4,400) \\
= $10,000 + $44,000 \\
= $54,000
\]

### 2.2.2 Graphic Analysis

**Introduction to Graphic Analysis.** When you only have two data points, you must generally assume a linear relationship. When you get more data, you can examine the data to determine if there is truly a linear relationship.

You should always graph the data before performing an algebraic analysis.

- Graphic analysis is the best way of developing an overall view of cost-volume relationship.
- Graphic analysis is useful in analyzing cost-volume relationships, particularly, when the cost and volume numbers involved are relatively small.
- Even when actual analysis is performed algebraically you can use graphs to demonstrate cost-volume analysis to others.

**Steps of Graphic Analysis.** There are four steps in using graph paper to analyze cost-volume relationships:

**Step 1. Determine the scale that you will use.** Volume is considered the independent variable and will be graphed on the horizontal axis. Cost is considered the dependent variable and will be graphed on the vertical axis. The scales on the two axes do not have to be the same. However, on each axis one block
must represent the same amount of change as every other block of the same size on that axis. Each scale should be large enough to permit analysis, and small enough to permit the graphing of all available data and anticipated data estimates.

**Step 2. Plot the available cost-volume data.** Find the volume given for one of the data points on the horizontal axis. Draw an imaginary vertical line from that point. Find the related cost on the vertical axis and draw an imaginary horizontal line from that point. The point where the two lines intersect represents the cost for the given volume. (If you do not feel comfortable with imaginary lines you may draw dotted lines to locate the intersection.) Repeat this step for each data point.

**Step 3. Fit a straight line to the data.** In this section of text, all data points will fall on a straight line. All that you have to do to fit a straight line is connect the data points. Most analysts use regression analysis to fit a straight line when all points do not fall on the line.

**Step 4. Estimate the cost for a given volume.** Draw an imaginary vertical line from the given volume to the point where it intersects the straight line that you fit to the data points. Then move horizontally until you intersect the vertical axis. That point is the graphic estimate of the cost for the given volume of the item.

*Example of Graphic Analysis.* The four steps of cost-volume-profit analysis can be used to graph and analyze any cost-volume relationship. Assume that you have been asked to estimate the cost of 400 units given the following data:

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<th>Units</th>
<th>Cost</th>
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<tr>
<td>200</td>
<td>$100,000</td>
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<td>500</td>
<td>$175,000</td>
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<td>600</td>
<td>$200,000</td>
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Step 1. Determine the scale that you will use.

Step 2. Plot the available cost-volume data.
Step 3. Fit a straight line to the data.

Step 4. Estimate the cost for a given volume. From the graph, you can estimate that the total cost of 400 units will be $150,000. In addition you can also estimate fixed cost. The cost of making zero units, $50,000, is the fixed cost for this set of data.
2.3 Analyzing The Price-Volume Relationship

Analysis Situations. In situations where you do not have offeror cost data, you can use the principles of the cost-volume relationship in price-volume analysis. Price-volume analysis is based on pricing information that is typically available to the Government negotiator.

Quantity Price Discounts. Unit prices normally decline as volume increases, primarily because fixed costs are being divided by an increasing number of units. Buyers see these price reductions with increasing volume in the form of quantity discounts.

Quantity discounts complicate the pricing decision, because a price that is reasonable for one volume may not be reasonable for a different volume. Offers quote quantity discounts because their costs per unit declines as volume increases. As a result, even though offered prices include profit, you can use the cost-volume equation to estimate prices at different quantities.

Steps for Estimating a Quantity Price Discount. Estimating a quantity price discount is a 4-step process:

Step 1. Calculate the variable element.

\[ V_U = \frac{(C_2 - C_1)}{(Q_2 - Q_1)} \]

\[ = \frac{($1,250,000 - $300,000)}{(500 - 100)} \]

\[ = \frac{$950,000}{400} \]

\[ = $2,375 \]

Step 2. Calculate the fixed element using data from the available data points.

\[ C = F + V_U (Q) \]

\[ $300,000 = F + $2,375 (100) \]
2.4 Analyzing The Cost-Volume-Profit Relationship

Until now, we have only looked at the cost-volume or price-volume relationship. Now, we are going to expand that relationship to consider the relationship between cost, volume, and profit.

Cost-Volume-Profit Equation. The revenue taken in by a firm is equal to cost plus profit. That can be written:

\[ \text{Revenue} = \text{Total Cost} + \text{Profit} \]

We have already seen that total cost (C) is:

\[ C = F + V_U(Q) \]

Using this information, we can rewrite the revenue equation as:

\[ \text{Revenue} = F + V_U(Q) + \text{Profit} \]

In the cost-volume-profit equation, \textit{profit can be positive, negative, or zero}. If profit is negative, we normally refer to it as a loss. If profit is zero, the firm is breaking even with no profit or loss. If we let \( P \) stand for profit, we can write the equation:

\[ \text{Revenue} = F + V_U(Q) + P \]

Revenue is equal to selling price per unit \( (R_U) \) multiplied by volume.

\[ \text{Revenue} = R_U(Q) \]

If we assume that the firm makes all the units that it sells, and sells all the units that it makes, we can complete the cost-volume-profit equation:

\[ R_U(Q) = F + V_U(Q) + P \]

\textit{Application of the Cost-Volume-Profit Equation}. This equation and limited knowledge of a contractor's cost structure can provide you with extremely valuable information on the effect purchase decisions can have on a firm's profitability.

\textit{Using the Cost-Volume-Profit Equation to Estimate Selling Price}. Given the following product information, a firm prepared an offer for an indefinite quantity contract with the Government for a new product developed by the firm. There are no other customers for the product. In developing the offer unit price estimate \( (R_U) \), the firm used its estimated costs and its best estimate of the quantity that it would sell under the contract.

\begin{align*}
\text{Fixed Cost} &= 10,000 \\
\text{Variable Cost per Unit} &= 20 \\
\text{Contract Minimum Quantity} &= 3,000 \text{ units} \\
\text{Contract Maximum Quantity} &= 6,000 \text{ units} \\
\text{Firm's Best Estimate of Quantity} &= 5,000 \text{ units} \\
\text{Target Profit} &= 5,000 \\
R_U(Q) &= F + V_U(Q) + P \\
R_U(5,000) &= 10,000 + 20(5,000) + 5,000 \\
R_U(5,000) &= 10,000 + 100,000 + 5,000 \\
R_U(5,000) &= 115,000 \\
R_U &= 115,000 / 5,000 \\
R_U &= 23.00 \\
\end{align*}

\textit{Using the Cost-Volume-Profit Equation to Estimate Profit}. Managers of the firm wanted to know how profits would be affected if it actually sold the maximum quantity \( (6,000 \text{ units}) \) at \$23.00 per unit.

\begin{align*}
R_U(Q) &= F + V_U(Q) + P \\
$23 \times 6,000 &= 10,000 + 20 \times 6,000 + 5,000 \\
$23 \times 6,000 &= 10,000 + 120,000 + 5,000 \\
$23 \times 6,000 &= 135,000 \\
$23 \times 6,000 &= 135,000 \text{ total price and a $2,625 unit price} \\
\end{align*}
\$138,000 = \$10,000 + \$120,000 + P \\
\$138,000 = \$130,000 + P \\
\$138,000 - \$130,000 = P \\
\$8,000 = P \\

If the firm sells 6,000 units at \$23.00 per unit, profit will be \$8,000. That is a \$3,000 increase from the original \$5,000 target profit, or an increase of 60 percent. Note that the firm's profit would increase solely because sales were higher than estimated.

Managers were even more concerned about how profits would be affected if they only sold the minimum quantity (4000 units) at \$23.00 per unit.

\[ RU(Q) = F + VU(Q) + P \]

\[ \$23(4,000) = \$10,000 + \$20(4,000) + P \]

\[ \$92,000 = \$10,000 + \$80,000 + P \]

\[ \$92,000 - \$90,000 = P \]

\[ \$2,000 = P \]

If the firm sells 4,000 at \$23.00 per unit, profit will be \$2,000. That is \$3,000 less than the original \$5,000 target profit. Note that the firm's profit would decrease solely because sales were lower than estimated. Using the Cost-Volume-Profit Equation to Estimate Break-Even Sales. In a final effort to analyze the risk to the firm under the proposed indefinite deliver contract, managers wanted to know the level of sales that would be required for the firm to break even (zero profit).

\[ RU(Q) = F + VU(Q) + P \]

\[ \$23 (Q) = \$10,000 + \$20 (Q) + 0 \]

\[ (\$23 - \$20) (Q) = \$10,000 \]

\[ \$3 (Q) = \$10,000 \]

\[ Q = \frac{\$10,000}{\$3} \]

\[ Q = 3,333.33 \text{ units} \]

The calculations show that the firm would break even at 3,333.33 units. Assuming that the firm could not sell .33 units, the firm must sell 3,334 units to assure that all costs are covered. Selling 3,333 units would still result in a \$10 loss.

**Contribution Income.** The difference between revenue and variable cost is contribution income (I). The term contribution income comes from the contribution made to covering fixed costs and profit. If contribution income is positive, increasing sales will increase profits or reduce losses. If contribution income is negative, increasing sales will reduce profits or create greater losses.

**Contribution Income = Revenue - Variable Cost**

Using symbols:

\[ I = RU(Q) - VU(Q) \]

\[ I = (RU - VU) (Q) \]

Knowledge of a contractor's cost structure and contribution income can be valuable in analysis of proposed costs.

**Contribution Income Example.** In evaluating an offeror's proposal for 500 units at \$900 each, your analysis reveals the following cost structure:

- Fixed Cost = \$100,000
- Variable Cost per Unit = \$1,000

How would this affect your analysis of contract risk?

\[ I = (RU - VU) (Q) \]

\[ = (\$900 - \$1,000) (500) \]

\[ = -\$100 (500) \]

\[ = -\$50,000 \]

The contribution income from the sale is a negative \$50,000. The firm would be substantially worse off for having made the sale. Unless the firm can offer a positive rationale for such a pricing decision, you must consider pricing as an important factor as you analyze the risk of contract performance.

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### 2.5 Identifying Issues And Concerns

**Questions to Consider in Analysis.** As you perform price/cost analysis, consider the issues and concerns identified in this section, whenever you use cost-volume-profit analysis concepts.

- Has the contractor’s cost structure changed substantially?
Application of cost-volume-profit analysis assumes that the period covered by the analysis is too short to permit facilities expansion or contraction or other changes that might affect overall pricing relationships. If the contractor has substantially changed its cost structure, your ability to use cost-volume-profit analysis may be limited. Examples of possible changes include:

- Downsizing to reduce fixed costs; and
- Increased investment in automated equipment to reduce variable costs of labor and material.

**Is the straight-line assumption reasonable?**
The cost-volume-profit relationship is not usually a straight-line relationship. Instead, it is a curvilinear relationship. A straight-line analysis works as long as the straight line is a good approximation of the cost-volume-profit relationship. Most computer programs designed to fit a straight-line to a set of data provide measures of how well the line fits the data. For example, a regression program will usually provide the coefficient of determination ($r^2$).

**Are current volume estimates within the relevant range of available data?**
If the current business volume is substantially higher or lower than the volumes used to develop the cost-volume-profit equation, the results may be quite unreliable. The contractor should be expected to change the way it does business and its cost structure if volume increases or decreases substantially.

### 3.0 - Chapter Introduction
In this chapter, you will learn to use descriptive statistics to organize, summarize, analyze, and interpret data for contract pricing.

**Categories of Statistics.** Statistics is a science which involves collecting, organizing, summarizing, analyzing, and interpreting data in order to facilitate the decision-making process. These data can be facts, measurements, or observations. For example, the inflation rate for various commodity groups is a statistic which is very important in contract pricing. Statistics can be classified into two broad categories:

- **Descriptive Statistics.** Descriptive statistics include a large variety of methods for summarizing or describing a set of numbers. These methods may involve computational or graphical analysis. For example, price index numbers are one example of a descriptive statistic. The measures of central tendency and dispersion presented in this chapter are also descriptive statistics, because they describe the nature of the data collected.

- **Inferential Statistics.** Inferential or inductive statistics are methods of using a sample data taken from a statistical population to make actual decisions, predictions, and generalizations related to a problem of interest. For example, in contract pricing, we can use stratified sampling of a proposed bill of materials to infer the degree it is overpriced or under-priced.

**Populations and Samples.** The terms population and sample are used throughout any discussion of statistics.

- **Population.** A population is the set of all possible observations of a phenomenon with which we are concerned. For example, all the line items in a bill of materials would constitute a population. A numerical characteristic of a population is called a parameter.

- **Sample.** A sample is a subset of the population of interest that is selected in order to make some inference about the whole population. For example, a group of line items randomly selected from a bill of materials for analysis would constitute a sample. A numerical characteristic of a sample is called a statistic.

In contract pricing, you will most likely use statistics because you do not have complete knowledge of the population or you do not have the resources needed to examine the population data. Because most pricing applications involve the use of sample data, this chapter will concentrate on statistical analysis using sample data. If you are interested in learning about descriptive or inferential analysis of numerical data.
population data, consult a college level statistics text.

Measure of Reliability. Since a sample contains only a portion of observations in the population, there is always a chance that our inference or generalization about the population will be inaccurate. Therefore, our inference should be accompanied by a measure of reliability. For example, let's assume that we are 90 percent sure that the average item in a bill of materials should cost 85 percent of what the contractor has proposed plus or minus 3 percent. The 3 percent is simply a boundary for our prediction error and it means there is a 90 percent probability that the error of our prediction is not likely to exceed 3 percent.

3.1 - Identifying Situations For Use

Situations for Use. Statistical analysis can be invaluable to you in:

- Developing Government objectives for contract prices based on historical values. Historical costs or prices are often used as a basis for prospective contract pricing. When several historical data points are available, you can use statistical analysis to evaluate the historical data in making estimates for the future. For example, you might estimate the production equipment set-up time based on average historical set-up times.

- Developing minimum and maximum price positions for negotiations. As you prepare your negotiation objective, you can also use statistical analysis to develop minimum and maximum positions through analysis of risk. For example, if you develop an objective of future production set-up time based on the average of historical experience, that average is a point estimate calculated from many observations. If all the historical observations are close to the point estimate, you should feel confident that actual set-up time will be close to the estimate. As the differences between the individual historical observations and the point estimate increase, the risk that the future value will be substantially different than the point estimate also increases. You can use statistical analysis to assess the cost risk involved and use that assessment in developing your minimum and maximum negotiation positions.

- Developing an estimate of risk for consideration in contract type selection. As described above, you can use statistical analysis to analyze contractor cost risk. In addition to using that analysis in developing your minimum and maximum negotiation positions you can use it in contract type selection. For example, if the risk is so large that a firm fixed-price providing reasonable protection to the contractor could also result in a wind-fall profit, you should consider an incentive or cost-reimbursement contract instead.

- Developing an estimate of risk for consideration in profit/fee analysis. An analysis of cost risk is also an important element in establishing contract profit/fee objectives. The greater the dispersion of historical cost data, the greater the risk in prospective contract pricing. As contractor cost risk increases, contract profit/fee should also increase.

- Streamlining the evaluation of a large quantity of data without sacrificing quality. Statistical sampling is particularly useful in the analysis of a large bill of materials. The stratified sampling techniques presented in this chapter allow you to:
  - Examine 100 percent of the items with the greatest potential for cost reduction; and
  - Use random sampling to assure that there is no general pattern of overpricing smaller value items.
  - The underlying assumption of random sampling is that a sample is representative of the population from which it is drawn.
  - If the sample is fairly priced, the entire stratum is assumed to be fairly priced; if the sample is overpriced, the entire stratum is assumed to be proportionately overpriced.

3.2 - Measuring Central Tendency

Measures of Central Tendency. You are about to prepare a solicitation for a product that your office has acquired several times before. Before you begin, you want to know what your office has historically paid for the product. You could rely exclusively on the last price paid, or you could collect data from the last several acquisitions. An array of data from several acquisitions will likely mean little without some statistical analysis.

To get a clearer picture of this array of data, you would likely want to calculate some measure of central tendency. A measure of central tendency is the central value around which data observations (e.g.,
historical prices) tend to cluster. It is the central value of the distribution. This section will examine calculation of the three most common and useful measures of central tendency:

- Arithmetic mean;
- Median; and
- Mode.

**Calculating the Arithmetic Mean.** The arithmetic mean (or simply the mean or average) is the measure of central tendency most commonly used in contract pricing. To calculate the mean, sum all observations in a set of data and divide by the total number of observations involved. The formula for this calculation is:

\[
\bar{X} = \frac{\sum X}{n}
\]

Where:
- \(\bar{X}\) = Sample mean
- \(\sum\) = Summation of all the variables that follow the symbol (e.g., \(\sum X\) represents the sum of all X values)
- X = Value for an observation of the variable X
- n = Total number of observations in the sample

**For example:** Suppose you are trying to determine the production lead time (PLT) for an electronic component using the following sample data:

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLT</td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>9</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

\[
\bar{X} = \frac{\sum X}{n} = \frac{9 + 7 + 9 + 9 + 11 + 8 + 11 + 8}{8} = \frac{72}{8} = 9 \text{ months}
\]

**Calculating the Median.** The median is the middle value of a data set when the observations are arrayed from the lowest to the highest (or from the highest to the lowest). If the data set contains an even number of observations, the median is the arithmetic mean of the two middle observations. It is often used to measure central tendency when a few observations might pull the measure from the center of the remaining data. For example, average housing value in an area is commonly calculated using the median, because a few extremely high-priced homes could result in a mean that presents an overvalued picture of the average home price.

**For the PLT example:** You could array the data from lowest to highest:

| X   | 7 | 8 | 8 | 9 | 9 | 9 | 11 | 11 |

Since there is an even number of observations, calculate median using the arithmetic mean of the two middle observations:

\[
Md = \frac{9 + 9}{2} = 9 \text{ months}
\]

**Calculating the Mode.** The mode is the observed value that occurs most often in the data set (i.e. the value with the highest frequency). It is often used to estimate which specific value is most likely to occur in the future. However, a data set may have more than one mode. A data set is described as:
Unimodal if it has only one mode.

Bimodal if it has two modes.

Multimodal if it has more than two modes.

For the PLT example: The mode is nine, because nine occurs three times, once more than any other value.

3.3 - Measuring Dispersion

Measures of Dispersion. As described in the previous section, the mean is the measure of central tendency most commonly used in contract pricing. Though the mean for a data set is a value around which the other values tend to cluster, it conveys no indication of the closeness of the clustering (that is, the dispersion). All observations could be close to the mean or far away. If you want an indication of how closely these other values are clustered around the mean, you must look beyond measures of central tendency to measures of dispersion. This section will examine:

- Several measures of absolute dispersion commonly used to describe the variation within a data set -- the range, mean absolute deviation, variance, and standard deviation.
- One measure of relative dispersion -- the coefficient of variation.

Assume that you have the following scrap rate data for two contractor departments:

<table>
<thead>
<tr>
<th>Month</th>
<th>Dept. A, Fabrication</th>
<th>Dept. B, Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>February</td>
<td>.065</td>
<td>.050</td>
</tr>
<tr>
<td>March</td>
<td>.035</td>
<td>.048</td>
</tr>
<tr>
<td>April</td>
<td>.042</td>
<td>.052</td>
</tr>
<tr>
<td>May</td>
<td>.058</td>
<td>.053</td>
</tr>
<tr>
<td>June</td>
<td>.032</td>
<td>.048</td>
</tr>
<tr>
<td>July</td>
<td>.068</td>
<td>.049</td>
</tr>
<tr>
<td>Total</td>
<td>.300</td>
<td>.300</td>
</tr>
<tr>
<td>Mean</td>
<td>.050</td>
<td>.050</td>
</tr>
</tbody>
</table>

The mean scrap rate for both departments is the same -- 5 percent. However, the monthly scrap rates in Department B show less variation (dispersion) around the mean. As a result, you would probably feel more comfortable forecasting a scrap rate of 5 percent for Department B than you would for Department A.

Differences in dispersion will not always be so obvious. The remainder of this section will demonstrate how you can quantify dispersion using the five measures identified above.

Calculating the Range. Probably the quickest and easiest measure of dispersion to calculate is the range. The range of a set of data is the difference between the highest and lowest observed values. The higher the range, the greater the amount of variation in a data set.

\[ R = H - L \]

Where:

- \( R \) = Range
- \( H \) = Highest observed value in the data set
- \( L \) = Lowest observed value in the data set

Calculating the Range for the Scrap-Rate Example. By comparing the range for Department A scrap-rate data with the range for Department B, you can easily determine that the historical data from Department A shows greater dispersion.
Mean Absolute Deviation. The mean absolute deviation (MAD) is the average absolute difference between the observed values and the arithmetic mean (average) for all values in the data set. If you subtracted the mean from each observation, some answers would be positive and some negative. The sum of all the deviations (differences) will always be zero. That tells you nothing about how far the average observation is from the mean. To make that computation, you can use the absolute difference between each observation and the mean. An absolute difference is the difference without consideration of sign and all absolute values are written as positive numbers. If the average is eight and the observed value is six, the calculated difference is a negative two (6 - 8 = -2), but the absolute difference would be two (without the negative sign).

Note: Absolute values are identified using a vertical line before and after the value (e.g., |X| identifies the absolute value of X).

To compute the MAD, use the following 5-step process:

Step 1. Calculate the arithmetic mean of the data set.
Step 2. Calculate the deviation (difference) between each observation and the mean of the data set.
Step 3. Convert each deviation to its absolute value (i.e., its value without considering the sign of the deviation).
Step 4. Sum the absolute deviations.
Step 5. Divide the total absolute deviation by the number of observations in the data set.

\[
\text{MAD} = \frac{\sum|X - \bar{X}|}{n}
\]

Calculating the Mean Absolute Deviation for the Scrap-Rate Example. We can use the 5-step process described above to calculate the scrap-rate MAD values for Departments A and B of the scrap-rate example.

Calculate the MAD for Department A:

Step 1. Calculate the arithmetic mean of the data set. We have already calculated the mean rate for Department A of the scrap-rate example -- .05.

Step 2. Calculate the deviation (difference) between each observation and the mean of the data set (\(X - \bar{X}\)).

<table>
<thead>
<tr>
<th></th>
<th>(X)</th>
<th>(\bar{X})</th>
<th>(X - \bar{X})</th>
</tr>
</thead>
<tbody>
<tr>
<td>.065</td>
<td>.050</td>
<td>.015</td>
<td></td>
</tr>
<tr>
<td>.035</td>
<td>.050</td>
<td>-.015</td>
<td></td>
</tr>
<tr>
<td>.042</td>
<td>.050</td>
<td>-.008</td>
<td></td>
</tr>
<tr>
<td>.058</td>
<td>.050</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td>.032</td>
<td>.050</td>
<td>-.018</td>
<td></td>
</tr>
<tr>
<td>.068</td>
<td>.050</td>
<td>.018</td>
<td></td>
</tr>
</tbody>
</table>

Step 3. Convert each deviation to its absolute value (|\(X - \bar{X}\)|).

|       | \(X\) | \(\bar{X}\) | \(X - \bar{X}\) | |\(X - \bar{X}\)| |
|-------|-------|------------|----------------|--------------|
| .065  | .050  | .015       | .015           | .015         |

Department A (Fabrication)

\[R_{\text{DEPT A}} = .068 - .032 = .036\]
\[R_{\text{DEPT B}} = .053 - .048 = .005\]
Step 4. Sum the absolute deviations $\sum |x - \bar{x}|$.

<table>
<thead>
<tr>
<th>Department A Fabrication</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x$</td>
</tr>
<tr>
<td>.065</td>
</tr>
<tr>
<td>.035</td>
</tr>
<tr>
<td>.042</td>
</tr>
<tr>
<td>.058</td>
</tr>
<tr>
<td>.032</td>
</tr>
<tr>
<td>.068</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Step 5. Divide the total absolute deviation by the number of observations in the data set.

$$MAD = \frac{\sum |x - \bar{x}|}{n}$$

$$MAD_{Dept, A} = \frac{.082}{6} = .014$$

Calculate the MAD for Department B:

Step 1. Calculate the arithmetic mean of the data set. We have also calculated the mean rate for Department B of the scrap-rate example -- .05.

Steps 2 - 4. Calculate the deviation between each observation and the mean of the data set; convert the deviation to its absolute value; and sum the absolute deviations. The following table demonstrates the three steps required to calculate the total absolute deviation for Department B:

<table>
<thead>
<tr>
<th>Department B (Assembly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x$</td>
</tr>
<tr>
<td>.050</td>
</tr>
<tr>
<td>.048</td>
</tr>
<tr>
<td>.052</td>
</tr>
<tr>
<td>.053</td>
</tr>
</tbody>
</table>
Step 5. Divide the total absolute deviation by the number of observations in the data set.

\[
\text{MAD} = \frac{\sum |X - \bar{X}|}{n}
\]

\[
\text{MAD}_{\text{dept B}} = \frac{.010}{6} = .002
\]

Compare MAD values for Department A and Department B:
The MAD for Department A is .014; the MAD for Department B is .002. Note that the MAD for Department B is much smaller than the MAD for Department A. This comparison once again confirms that there is less dispersion in the observations from Department B.

**Calculating the Variance.** Variance is one of the two most popular measures of dispersion (the other is the standard deviation which is described below). The variance of a sample is the average of the squared deviations between each observation and the mean. However, statisticians have determined when you have a relatively small sample, you can get a better estimate of the true population variance if you calculate variance by dividing the sum of the squared deviations by \(n - 1\), instead of \(n\).

The term, \(n - 1\), is known as the number of degrees of freedom that can be used to estimate population variance. This adjustment is necessary, because samples are usually more alike than the populations from which they are taken. Without this adjustment, the sample variance is likely to underestimate the true variation in the population. Division by \(n - 1\) in a sense artificially inflates the sample variance but in so doing, it makes the sample variance a better estimator of the population variance. As the sample size increases, the relative affect of this adjustment decreases (e.g., dividing by four rather than five will have a greater affect on the quotient than dividing by 29 instead of 30).

To compute the variance, use this 5-step process:
Step 1. Calculate the arithmetic mean of the data set.
Step 2. Calculate the deviation (difference) between each observation and the mean of the data set.
Step 3. Square each deviation.
Step 4. Sum the squared deviations.
Step 5. Divide the sum of the squared deviations by \(n - 1\).

**Calculate the variance for Department A:**
Step 1. Calculate the arithmetic mean of the data set. We have already calculated the mean rate for Department A of the scrap-rate example -- .05.
Step 2. Calculate the deviation (difference) between each observation and the mean of the data set \((X - \bar{X})\). The deviations for Department A are the same as we calculated in calculating the mean absolute deviation.

<table>
<thead>
<tr>
<th>Department A (Fabrication)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X)</td>
</tr>
<tr>
<td>.065</td>
</tr>
</tbody>
</table>
### Step 3. Square each deviation \((x_i - \bar{x})^2\).

| X     | \(\bar{x}\) | \(x_i - \bar{x}\) | \(|x_i - \bar{x}|\) |
|-------|-------------|-------------------|-----------------|
| .065  | .050        | .015              | .000225         |
| .035  | .050        | -.015             | .000225         |
| .042  | .050        | -.008             | .000064         |
| .058  | .050        | .008              | .000064         |
| .032  | .050        | -.018             | .000324         |
| .068  | .050        | .018              | .000324         |

### Step 4. Sum the total absolute deviations \(\sum|x_i - \bar{x}|\).

| X     | \(\bar{x}\) | \(x_i - \bar{x}\) | \(|x_i - \bar{x}|\) |
|-------|-------------|-------------------|-----------------|
| .065  | .050        | .015              | .000225         |
| .035  | .050        | -.015             | .000225         |
| .042  | .050        | -.008             | .000064         |
| .058  | .050        | .008              | .000064         |
| .032  | .050        | -.018             | .000324         |
| .068  | .050        | .018              | .000324         |
| **Total** |          |                   | **.001226**    |

### Step 5. Divide the sum of the squared deviations by \(n-1\).
Calculate the variance for Department B

Step 1. Calculate the arithmetic mean of the data set. We have also calculated the mean rate for Department B of the scrap-rate example -- .05.

Steps 2 - 4. Calculate the deviation between each observation and the mean of the data set; convert the deviation to its absolute value; and sum the absolute deviations. The following table demonstrates the three steps required to calculate the total absolute deviation for Department B:

<table>
<thead>
<tr>
<th>Department B (Assembly)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X - X</td>
<td>(X - X)^2</td>
<td></td>
</tr>
<tr>
<td>.050</td>
<td>.050</td>
<td>.000</td>
<td>.000000</td>
<td></td>
</tr>
<tr>
<td>.048</td>
<td>.050</td>
<td>-.002</td>
<td>.000004</td>
<td></td>
</tr>
<tr>
<td>.052</td>
<td>.050</td>
<td>.002</td>
<td>.000004</td>
<td></td>
</tr>
<tr>
<td>.053</td>
<td>.050</td>
<td>.003</td>
<td>.000009</td>
<td></td>
</tr>
<tr>
<td>.048</td>
<td>.050</td>
<td>-.002</td>
<td>.000004</td>
<td></td>
</tr>
<tr>
<td>.049</td>
<td>.050</td>
<td>-.001</td>
<td>.000001</td>
<td></td>
</tr>
</tbody>
</table>

Step 5. Divide the sum of the squared deviations by n-1.

\[ S^2 = \frac{\sum (X - \overline{X})^2}{n-1} \]

\[ S^2_{\text{Dept A}} = \frac{.001226}{6 - 1} = \frac{.001226}{5} = .000245 \]

Compare variances for Department A and Department B:
The variance for Department A is .000245; the variance for Department B is .000004. Once again, the variance comparison confirms that there is less dispersion in the observations from Department B.

Concerns About Using the Variance as a Measure of Dispersion. There are two concerns commonly raised about using the variance as a measure of dispersion:

- As the deviations between the observations and the mean grow, the variation grows much faster, because all the deviations are squared in variance calculation.
- The variance is in a different denomination than the values of the data set. For example, if the basic values are measured in feet, the variance is measured in square feet; if the basic values are measured in terms of dollars, the variance is measured in terms of "square dollars."

Calculating the Standard Deviation. You can eliminate these two common concerns by using the standard deviation -- the square root of the variance.
\[ S = \sqrt{S^2} \]

For example: You can calculate the standard deviation for Departments A and B of the scrap-rate example:

\[
\begin{align*}
S_{\text{Dept. A}} &= \sqrt{.000245} \\
&= .015652 \\
S_{\text{Dept. B}} &= \sqrt{.000004} \\
&= .002000
\end{align*}
\]

The standard deviation for Departments A and B of the scrap-rate example yields a standard deviation of .015652 for Department A, and .002000 for Department B.

**Note:** Both the variance and the standard deviation give increasing weight to observations that are further away from the mean. Because all values are squared, a single observation that is far from the mean can substantially affect both the variance and the standard deviation.

**Empirical Rule.** The standard deviation has one characteristic that makes it extremely valuable in statistical analysis. In a distribution of observations that is approximately symmetrical (normal):

- The interval ± 1S includes approximately 68 percent of the total observations in the population.
- The interval ± 2S includes approximately 95 percent of the total observations in the population.
- The interval ± 3S includes approximately 99.7 percent of the total observations in the population.

This relationship is actually a finding based on analysis of the normal distribution (bell shaped curve) that will be presented later in the chapter.

**Coefficient of Variation.** Thus far we have only compared two samples with equal means. In that situation, the smaller the standard deviation, the smaller the relative dispersion in the sample observations. However, that is not necessarily true when the means of two samples are not equal. If the means are not equal, you need a measure of relative dispersion. The coefficient of variation (CV) is such a measure.

\[ CV = \frac{S}{\overline{X}} \]

**For example:** Which of the following samples has more relative variation?

**Sample C:** \( \overline{X} = 25 \quad S = 5 \)

**Sample D:** \( \overline{X} = 100 \quad S = 10 \)

Calculate CV for Sample C:

\[ CV_C = \frac{5}{25} = .20 \]

Calculate CV for Sample D:

\[ CV_D = \frac{10}{100} = .10 \]

Compare the two CV values:

Even though the standard deviation for Sample D is twice as large as the standard deviation for Sample C, the CV values demonstrate that Sample D exhibits less relative variation. This is true because the mean for Sample D is so much larger than the mean for Sample C.

**Note:** We could calculate CV for the scrap-rate example, but such a calculation is not necessary because the means of the two samples are equal.
3.4 Establishing a Confidence Interval

**Confidence Interval.** Each time you take a sample from a population of values you can calculate a mean and a standard deviation. Even if all the samples are the same size and taken using the same random procedures, it is unlikely that every sample will have the same mean and standard deviation. However, if you could collect all possible samples from the normally distributed population and calculate the mean value for all the sample means, the result would be equal to the population mean. In statistical terminology, the mean of the sampling distribution is equal to the population mean.

You can combine the sample mean and sample standard deviation with an understanding of the shape of distribution of sample means to develop a **confidence interval** -- a probability statement about an interval which is likely to contain the true population mean.

For example: Suppose that you are preparing a solicitation for an indefinite-quantity transmission overhaul contract to support a fleet of 300 light utility trucks. You believe that you can develop an accurate estimate of the number of transmissions that will require a major overhaul during the contract period, if you can determine the date of the last major overhaul for each vehicle transmission and estimate the period between overhauls. You select a simple random sample (without replacement) of 25 vehicle maintenance records from the 300 fleet vehicle maintenance records. Analyzing the sample, you find that the mean time between overhauls is 38 months and the sample standard deviation (S) is 4 months. Based on this analysis, your point estimate of the average transmission life for all vehicles in the fleet (the population mean) is 38 months. But you want to establish reasonable estimates of the minimum and maximum number of repairs that will be required during the contract period. You want to be able to state that you are 90% confident that the average fleet transmission life is within a defined range (e.g., between 36 and 40 months).

To make this type of statement, you need to establish a confidence interval. You can establish a confidence interval using the sample mean, the standard error of the mean, and an understanding of the normal probability distribution and the t distribution.

**Standard Error of the Mean.** If the population is normally distributed, the standard error of the mean is equal to the population standard deviation divided by the square root of sample size. Since we normally do not know the population standard deviation, we normally use the sample standard deviation to estimate the population standard deviation.

\[
\frac{S}{\sqrt{n}}
\]

**Normal Probability Distribution.** The normal probability distribution is the most commonly used continuous distribution. Because of its unique properties, it applies to many situations in which it is necessary to make inferences about a population by taking samples. It is a close approximation of the distribution of such things as human characteristics (e.g., height, weight, and intelligence) and the output of manufacturing processes (e.g., fabrication and assembly). The normal probability distribution provides the probability of a continuous random variable, and has the following characteristics:

- It is a symmetrical (i.e., the mean, median, and mode are all equal) distribution and half of the possible outcomes are on each side of the mean.
The total area under the normal curve is equal to 1.00. In other words, there is a 100 percent probability that the possible observations drawn from the population will be covered by the normal curve.

- It is an asymptotic distribution (the tails approach the horizontal axis but never touch it).
- It is represented by a smooth, unimodal, bell-shaped curve, usually called a "normal probability density function" or "normal curve."
- It can be defined by two characteristics—the mean and the standard deviation. (See the figure below.)

NORMAL CURVE

\[ \bar{X} \]

**Conditions for Using the Normal Distribution.** You can use the normal curve to construct confidence intervals around a sample mean when you know the population mean and standard deviation.

**t Distribution.** In contract pricing, the conditions for using the normal curve are rarely met. As a result, you will normally need to use a variation of the normal distribution called the "t-distribution."

The t distribution has the following characteristics:

- It is symmetrical, like the normal distribution, but it is a flatter distribution (higher in the tails).
- Whereas a normal distribution is defined by the mean and the standard deviation, the t distribution is defined by degrees of freedom.
- There is a different t distribution for each sample size.
- As the sample size increases, the shape of the t distribution approaches the shape of the normal distribution.

**t Distribution**
**Relationship Between Confidence Level and Significance Level.**

**Confidence Level.** The term confidence level refers to the confidence that you have that a particular interval includes the population mean. In general terms, a confidence interval for a population mean when the population standard deviation is unknown and n < 30 can be constructed as follows:

\[ \bar{X} \pm t \frac{s}{\sqrt{n}} \]

Where:

- \( t \) = t Table value based on sample size and the significance level
- \( s_x \) = Standard error of the mean

**Significance Level.** The significance level is equal to 1.00 minus the confidence level. For example, if the confidence level is 95 percent, the significance level is 5 percent; if the confidence level is 90 percent, the significance level is 10 percent. The significance level is, then, the area outside the interval which is likely to contain the population mean.

The figure below depicts a 90 percent confidence interval. Note that the significance level is 10 percent -- a 5 percent risk that the population mean is greater than the confidence interval plus a 5 percent risk that the mean is less than the confidence interval.

![90 Percent Confidence Interval](image)

**Setting the Significance Level.** When you set the significance level, you must determine the amount of risk you are willing to accept that the confidence interval does not include the true population mean. As the amount risk that you are willing to accept decreases, the confidence interval will increase. In other words, to be more sure that the true population mean is included is the interval, you must widen the interval.

Your tolerance for risk may vary from situation to situation, but for most pricing decisions, a significance level of .10 is appropriate.

**Steps for Determining the Appropriate t Value for Confidence Interval Construction.** After you have taken a random sample, calculated the sample mean and the standard error of the mean, you need only a value of t to construct a confidence interval. To obtain the appropriate t value, use the following steps:

**Step 1. Determine your desired significance level.** As stated above, for most contract pricing situations, you will find a significance level of .10 appropriate. That will provide a confidence level of .90 (1.00 - .10 = .90).

**Step 2. Determine the degrees of freedom.** Degrees of freedom (df) are the sample size minus one (n - 1).

**Step 3. Determine the t value from the t Table.** Find the t value at the intersection of the df row and the .10 column.

**Constructing a Confidence Interval for the Transmission Overhaul Example.** Recall the transmission overhaul example, where you wanted to estimate the useful life of transmissions of a fleet of 300 light utility trucks. We took a random sample of size n = 25 and calculated the following:

\[ \bar{X} \pm t \frac{s}{\sqrt{n}} \]

Where:
\[ \bar{X} = 38 \text{ months} \]
\[ S = 4 \text{ months} \]
\[ \frac{S}{\bar{X}} = .8 \text{ months} \]

Assume that you want to construct a 90% confidence interval for the population mean (the actual average useful life of the transmissions). You have all the values that you need to substitute into the formula for confidence interval except the t value. To determine the t value for a confidence interval, use the following steps:

**Determine the appropriate t value:**

**Step 1.** Determine the significance level. Use the significance level of .10.

**Step 2.** Determine the degrees of freedom.

\[ df = n - 1 \]
\[ = 25 - 1 \]
\[ = 24 \]

**Step 3.** Determine the t value from the t Table. Find the t value at the intersection of the df = 24 row and the .10 column. The following table is an excerpt of the t Table:

<table>
<thead>
<tr>
<th>Partial t Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>df</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>23</td>
</tr>
<tr>
<td>24</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>26</td>
</tr>
</tbody>
</table>

Reading from the table, the appropriate t value is 1.711.

**Use the t Value and Other Data to Construct Confidence Interval:**

The confidence interval for the true population mean (the actual average useful life of the transmissions) would be:

\[ \bar{X} \pm t \frac{S}{\bar{X}} \]
\[ 38 \pm 1.711 (.8) \]
\[ 38 \pm 1.37 \text{ (rounded from 1.3688)} \]

Confidence interval for the population mean \( (\mu) \): 36.63 < \( \mu \) < 39.37
That is, you would be 90 percent confident that the average useful life of the transmissions is between 36.63 and 39.37 months.

### 3.5 Using Stratified Sampling

**Stratified Sampling Applications in Contract Pricing.** You should consider using sampling when you have a large amount of data and limited time to conduct your analysis. While there are many different methods of sampling, stratified sampling is usually the most efficient and effective method of sampling for cost/price analysis. Using stratified sampling allows you to concentrate your efforts on the items with the greatest potential for cost/price reduction while using random sampling procedures to identify any general pattern of overpricing of smaller value items.

The most common contract pricing use of stratified sampling is analysis of detailed material cost proposals. Often hundreds, even thousands, of material items are purchased to support production of items and systems to meet Government requirements. To analyze the quantity requirements and unit prices for each item would be extremely time consuming and expensive. Effective review is essential,
because often more than 50 percent of the contract price is in material items. The overall environment is custom made for the use of stratified sampling.

**Steps in Stratified Sampling.** In stratified sampling, the components of the proposed cost (e.g., a bill of materials) to be analyzed are divided into two or more groups or strata for analysis. One group or stratum is typically identified for 100 percent review and the remaining strata are analyzed on a sample basis. Use the following steps to develop a negotiation position based on stratified sampling:

**Step 1. Identify a stratum of items that merit 100 percent analysis.** Normally, these are high-value items that merit the cost of 100 percent analysis. However, this stratum may also include items identified as high-risk for other reasons (e.g., a contractor history of overpricing).

**Step 2. Group the remaining items into one or more stratum for analysis.** The number of additional strata necessary for analysis will depend on several factors:

- If the remaining items are relatively similar in price and other characteristics (e.g., industry, type of source, type of product), only one additional stratum may be required.
- If the remaining items are substantially different in price or other characteristics, more than one stratum may be required. For example, you might create one stratum for items with a total cost of $5,001 to $20,000 and another stratum for all items with a total cost of $5,000 or less.
- If you use a sampling procedure that increases the probability of selecting larger dollar items (such as the dollar unit sampling procedure available in E-Z-Quant), the need for more than one stratum may be reduced.

**Step 3. Determine the number of items to be sampled in each stratum.** You must analyze all items in the strata requiring 100 percent analysis. For all other strata, you must determine how many items you will sample. You should consider several factors in determining sample size. The primary ones are variability, desired confidence, and the total count of items in the stratum. Use statistical tables or computer programs to determine the proper sample size for each stratum.

**Step 4. Select items for analysis.** In the strata requiring random sampling, each item in the stratum must have an equal chance of being selected and each item must only be selected once for analysis. Assign each item in the population a sequential number (e.g., 1, 2, 3; or 1001, 1002, 1003). Use a table of random numbers or computer generated random numbers to identify the item numbers to be included in the sample.

**Step 5. Analyze all items identified for analysis, summing recommended costs or prices for the 100 percent analysis stratum and developing a decrement factor for any stratum being randomly sampled.** In the stratum requiring 100 percent analysis, you can apply any recommended price reductions directly to the items involved. In any stratum where you use random sampling, you must apply any recommended price reductions to all items in the stratum.

- Analyze the proposed cost or price of each sampled item.
- Develop a “should pay” cost or price for the item. You must do this for every item in the sample, regardless of difficulty, to provide statistical integrity to the results. If you cannot develop a position on a sampled item because offeror data for the item is plagued by excessive misrepresentations or errors, you might have to discontinue your analysis and return the proposal to the offeror for correction and update.
- Determine the average percentage by which should pay prices for the sampled items differ from proposed prices. This percentage is the **decrement factor**.

(There are a number of techniques for determining the “average” percentage which will produce different results. For example, you could (1) determine the percentage by which each should pay price differs from each proposed price, (2) sum the percentages, and (3) divide by the total number of items in the sample. This technique gives equal weight to all sampled items in establishing the decrement factor. Or you could (1) total proposed prices for all sampled items, (2) total the dollar differences between should pay and proposed prices, and (3) divide the latter total by the former total. This technique gives more weight to the higher priced sampled items in establishing the decrement factor.)

- Calculate the confidence interval for the decrement factor.

**Step 6. Apply the decrement factor to the total proposed cost of all items in the stratum.** The resulting dollar figure is your prenegotiation position for the stratum. Similarly, use confidence intervals to develop the negotiation range.

**Step 7. Sum the prenegotiation positions for all strata to establish your overall position on the cost category.**
**Stratified Sampling Example.** Assume you must analyze a cost estimate that includes 1,000 material line items with a total cost of $2,494,500. You calculate that you must analyze a simple random sample of 50 line items.

**Step 1. Identify a stratum of items that merit 100 percent analysis.** You want to identify items that merit 100 percent analysis because of their relatively high cost. To do this, you prepare a list of the 1,000 line items organized from highest extended cost to lowest extended. The top six items on this list look like this:

- Item 1: $675,000
- Item 2: $546,500
- Item 3: $274,200
- Item 4: $156,800
- Item 5: $101,300
- Item 6: $26,705

Note that the top five items $1,753,800 (about 70 percent of the total material cost). You will commonly find that a few items account for a large portion of proposed material cost. Also note that there is a major drop from $101,300 to $26,705. This is also common. Normally, you should look for such break points in planning for analysis. By analyzing Items 1 to 5, you will consider 70 percent of proposed contract cost.

You can use random sampling procedures to identify pricing trends in the remaining 30 percent.

**Step 2. Group the remaining items into one or more stratum for analysis.** A single random sampling stratum is normally adequate unless there is a very broad range of prices requiring analysis. This typically only occurs with multimillion dollar proposals. Here, the extended prices for the items identified for random sampling range from $5.00 to $26,705. While this is a wide range, the dollars involved seem to indicate that a single random sampling strata will be adequate.

**Step 3. Determine the number of items to be sampled in each stratum.** Based on the dollars and the time available, you determine to sample a total of 20 items from the remaining 995 on the bill of materials.

**Step 4. Select items for analysis.**

- One way that you could select items for analysis would be putting 1,000 sheets of paper, one for each line item, into a large vat, mix them thoroughly, and select 20 slips of paper from the vat. If the slips of paper were thoroughly mixed, you would identify a simple random sample.

- A less cumbersome method would be to use a random number table (such as the example below) or a computer program to pick a simple random sample. A random number is one in which the digits 0 through 9 appear in no particular pattern and each digit has an equal probability (1/10) of occurring.

- The number of digits in each random number should be greater than or equal to the number of digits we have assigned to any element in the population.

- To sample a population of 995 items, numbered 1 to 995, random numbers must have at least three digits. Since you are dealing with three digit numbers, you only need to use the first three digits of any random number that includes four or more digits.

- Using a random number table below:
  - You could start at any point in the table. However, it is customary to select a start point at random. Assume that you start at Row 2, Column 3. The first number is 365; hence the first line item in our sample would be the item identified as 365.
  - Proceed sequentially until all 20 sample line items have been selected. The second number is 265, the third 570, etc. When you get to the end of the table you would go to Row 1, Column 4.

<table>
<thead>
<tr>
<th>Random Number Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>669 8450</td>
</tr>
<tr>
<td>823 0671</td>
</tr>
<tr>
<td>3307 349</td>
</tr>
<tr>
<td>4557 294</td>
</tr>
<tr>
<td>4867 520</td>
</tr>
<tr>
<td>5256 666</td>
</tr>
<tr>
<td>7629 754</td>
</tr>
</tbody>
</table>
Step 5. Analyze all items identified for analysis summing recommended costs or prices for the 100 percent analysis stratum and developing a decrement factor for any stratum being randomly sampled.

Results of 100 Percent Analysis. Use of the 100 percent analysis is straightforward. In this example, the offeror proposed a total of $1,753,800 for 5 line items of material. An analysis of these items found that the unit cost estimates were based on smaller quantities than required for the contract. When the full requirement was used, the total cost for those five items decreased to $1,648,600. Since the analysis considered all items in the stratum, you simply need to use the findings in objective development.

Random Sample Results. The random sample included 20 items with an estimated cost of $75,000. Analysis finds that the cost of the sampled items should be only 98 percent of the amount proposed. However, the confidence interval indicates that costs may range from 96 to 100 percent of the costs proposed.

Step 6. Apply the decrement factor to the total proposed cost of all items in the stratum.

Results of 100 Percent Analysis. There is no need to apply a decrement factor to these items because the recommended cost of $1,648,600 resulted from analysis of all items in this stratum.

Random Sample Results. The assumption is that the sample is representative of the entire population. If the sample is overpriced, the entire population of is similarly overpriced. As a result the recommended cost objective would be $725,886, or 98 percent of the proposed $740,700. However, the confidence interval would be $711,072 (96 percent of $740,700) to $740,700 (100 percent of $740,700).

Step 7. Sum the prenegotiation positions for all strata to establish your overall position on the cost category.

Point Estimate. The total point estimate results from the 100 percent and random sample analyses would be $2,374,486 ($1,648,600 + $725,886).

Confidence Interval: The confidence interval would run from $2,359,672 ($1,648,600 + $711,072) to
$2,389,300 ($1,648,600 + $740,700). Note that the position on the stratum subject to 100 percent analysis would not change.

3.6 Identifying Issues and Concerns

**Questions to Consider in Analysis.** As you perform price or cost analysis, consider the issues and concerns identified in this section, whenever you use statistical analysis.

- **Are the statistics representative of the current contracting situation?**
  Whenever historical information is used to make an estimate of future contract performance costs, assure that the history is representative of the circumstances that the contractor will face during contract performance.

- **Have you considered the confidence interval in developing a range of reasonable costs?**
  Whenever sampling procedures are used, different samples will normally result in different estimates concerning contractor costs. Assure that you consider the confidence interval in making your projections of future costs. Remember that there is a range of reasonable costs and the confidence interval will assist you in better defining that range.

- **Is the confidence interval so large as to render the point estimate meaningless as a negotiation tool?**
  If the confidence interval is very large (relative to the point estimate), you should consider increasing the sample size or other means to reduce the risk involved.

- **Is your analysis, including any sample analysis, based on current, accurate, and complete information?**
  A perfect analysis of information that is not current accurate and complete will likely not provide the best possible estimates of future contract costs.

- **Do the items with questioned pricing have anything in common?**
  If items with questioned pricing are related, consider collecting them into a separate stratum for analysis. For example, you might find that a large number of pricing questions are related to quotes from a single subcontractor. Consider removing all items provided by that subcontractor from existing strata for separate analysis.

4.0 - Chapter Introduction

In this chapter, you will learn to use cost estimating relationships to estimate and analyze estimates of contract cost/price.

**Cost Estimating Relationship Definition.** As the name implies, a cost estimating relationship (CER) is a technique used to estimate a particular cost or price by using an established relationship with an independent variable. If you can identify an independent variable (driver) that demonstrates a measurable relationship with contract cost or price, you can develop a CER. That CER may be mathematically simple in nature (e.g., a simple ratio) or it may involve a complex equation.

The goal is to create a statistically valid cost estimating relationship using historical data. The parametric CER can then be used to estimate the cost of the new program by entering its specific characteristics into the parametric model. CERs established early in a program’s life cycle should be continually revisited to make sure they are current and the input range still applies to the new program. In addition, parametric CERs should be well documented, because serious estimating errors could occur if the CER is improperly used.

It is important to make sure that the program attributes being estimated fall within (or, at least, not far outside) the CER dataset. For example, if a new software program was expected to contain 1 million software lines of code and the data points for a software CER were based on programs with lines of code.
ranging from 10,000 to 250,000, it would be inappropriate to use the CER to estimate the new program. Among the several advantages to using cost estimating relationships are:

- Versatility: If the data are available, parametric relationships can be derived at any level, whether system or subsystem component. And as the design changes, CERs can be quickly modified and used to answer what-if questions about design alternatives.
- Sensitivity: Simply varying input parameters and recording the resulting changes in cost can produce a sensitivity analysis.
- Statistical output: Parametric relationships derived from statistical analysis generally have both objective measures of validity (statistical significance of each estimated coefficient and of the model as a whole) and a calculated standard error that can be used in risk analysis. This information can be used to provide a confidence level for the estimate, based on the CER’s predictive capability.
- Objectivity: CERs rely on historical data that provide objective results. This increases the estimate’s defensibility.

Disadvantages of CERs include:

- Database requirements: The underlying database must be consistent and reliable. It may be time consuming to normalize the data or to ensure that the data were normalized correctly, especially if someone outside the estimator’s team developed the CER. Without understanding how the data were normalized, the analyst has to accept the database on faith—sometimes called the black-box syndrome, in which the analyst simply plugs in numbers and unquestioningly accepts the results. Using a CER in this manner can increase the estimate’s risk.
- Currency: CERs must represent the state of the art; that is, they must be updated to capture the most current cost, technical, and program data. Existing CERs must be validated that the current data still result in the established CER.
- Relevance: Using data outside the CER range may cause errors, because the CER loses its predictive ability for data outside the development range.
- Complexity: Complicated CERs (such as nonlinear CERs) may make it difficult for others to readily understand the relationship between cost and its independent variables.

Steps for Developing a CER. Strictly speaking, a CER is not a quantitative technique. It is a framework for using appropriate quantitative techniques to quantify a relationship between an independent variable and contract cost or price. Developing a CER is a 6-step process. Follow the six steps whenever you develop a CER. Whenever you evaluate a CER developed by someone else, determine whether the developer followed the six steps properly.

Step 1. Define the dependent variable (e.g., cost dollars, hours, and so forth.) Define what the CER will estimate. Will the CER be used to estimate price, cost dollars, labor hours, material cost, or some other measure of cost? Will the CER be used to estimate total product cost or estimate the cost of one or more components? The better the definition of the dependent variable, the easier it will be to gather comparable data for CER development.

Step 2. Select independent variables to be tested for developing estimates of the dependent variable. In selecting potential independent variables for CER development:

- Draw on personal experience, the experience of others, and published sources of information. When developing a CER for a new state-of-the-art item, consult experts experienced with the appropriate technology and production methods.
- Consider the following factors:
  - Variables should be quantitatively measurable. Parameters such as maintainability are difficult to use in estimating because they are difficult to measure quantitatively.
  - Data availability is also important. If you cannot obtain historical data, it will be impossible to analyze and use the variable as a predictive tool. For example, an independent variable such as physical dimensions or parts count would be of little value during the conceptual phase of system development when the values of the independent variables are not known. Be especially wary of any CER based on 2 or 3 data observations.
  - If there is a choice between developing a CER based on performance or physical characteristics, performance characteristics are generally the better choice, because
performance characteristics are usually known before design characteristics.  

Step 3. Collect data concerning the relationship between the dependent and independent variables. Collecting data is usually the most difficult and time-consuming element of CER development. It is essential that all data be checked and double checked to ensure that all observations are relevant, comparable, and relatively free of unusual costs.

Step 4. Explore the relationship between the dependent and independent variables. During this step, you must determine the strength of the relationship between the independent and dependent variables. This phase of CER development can involve a variety of analytical techniques from simple graphic analysis to complex mathematical analysis. Simple ratio analysis, moving averages, and linear regression are some of the more commonly used quantitative techniques used in analysis.

Step 5. Select the relationship that best predicts the dependent variable. After exploring a variety of relationships, you must select the one that can best be used in predicting the dependent variable. Normally, this will be the relationship that best predicts the values of the dependent variable. A high correlation (relationship) between a potential independent variable and the dependent variable often indicates that the independent variable will be a good predictive tool. However, you must assure that the value of the independent variable is available in order for you to make timely estimates. If it is not, you may need to consider other alternatives.

Step 6. Document your findings. CER documentation is essential to permit others involved in the estimating process to trace the steps involved in developing the relationship. Documentation should involve the independent variables tested, the data gathered, sources of data, time period of the data, and any adjustments made to the data.

4.1 - Identifying Situations For Use

Situations for Use. You can use a cost estimating relationship (CER) in any situation where you quantify one of the following:

- A relationship between one or more product characteristics and contract cost or price. A product-to-cost relationship uses product physical or performance characteristics to estimate cost or product price. The characteristic or characteristics selected for CER development are usually not the only ones driving cost, but the movement of cost has been found to be related to changes in these characteristics. The following table identifies several product characteristic that have been used in CER development:

<table>
<thead>
<tr>
<th>Product</th>
<th>Independent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Construction</td>
<td>Floor space, roof surface area, wall surface</td>
</tr>
<tr>
<td>Gears</td>
<td>Net weight, gross weight, horsepower, number of driving axles, loaded cruising speed</td>
</tr>
<tr>
<td>Trucks</td>
<td>Empty weight, gross weight, horsepower, number of driving axles, loaded cruising speed</td>
</tr>
<tr>
<td>Passenger Car</td>
<td>Curb weight, wheel base, passenger space, horsepower</td>
</tr>
<tr>
<td>Turbine Engine</td>
<td>Dry weight, maximum thrust, cruise thrust, specific fuel consumption, by-pass ratio, inlet temperature</td>
</tr>
<tr>
<td>Reciprocating Engine</td>
<td>Dry weight, piston displacement, compression ratio, horsepower</td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>Net weight, percent of scrap, number of</td>
</tr>
</tbody>
</table>
holes drilled, number of rivets placed, inches of welding, volume of envelope

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Empty weight, speed, useful load, wing area, power, landing speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel Locomotive</td>
<td>Horsepower, weight, cruising speed, maximum load on standard grade at standard speed</td>
</tr>
</tbody>
</table>

- A relationship between one or more elements of contract cost and another element of contract cost or price. A cost-to-cost relationship uses one or more elements of contract cost to estimate cost or product price. If you can establish a relationship between different elements of cost (e.g., between senior engineering labor hours and engineering technician hours), you can use a CER to reduce your estimating or analysis effort while increasing accuracy. If you can establish a relationship between an element of cost and total price (e.g., between direct labor cost and total price), you can use that information to supplement price analysis, without requiring extensive cost information.

4.2 - Identifying And Using Rules Of Thumb

Identifying Rules of Thumb. As you perform your market analysis, you should be on the lookout for cost estimating rules of thumb that are commonly used in the product marketplace. For example, when we compare the prices of houses, we typically do so in price per square foot. Using this rule of thumb, we can compare the cost of different houses or the same house in different parts of the country. There may be ways to develop more accurate estimates, but this rule of thumb is widely accepted, relatively easy to calculate, and it provides reasonably accurate results for many purposes. The same statement can probably be made about most rules of thumb. You may be able to develop better cost estimating relationships, but given the time available and the dollars involved, rules of thumb often provide useful tools for contract pricing.

Validate a Rule of Thumb Before Using. Like any CER, a rule of thumb can be based on another cost, performance characteristic, or physical characteristic of the item being priced. Unlike other CERs, rules of thumb typically have not been validated for use in specific estimating situations. Validation has come from acceptable results produced in a variety of situations over a number of years. Before you use a rule of thumb, consider the 6-step CER development process and ask the following questions:

- Can the rule of thumb reasonably be used to estimate what you are trying to estimate (e.g., cost, hours, or price)?
- Are there other rules of thumb that can be used to estimate the same cost, hours, or price?
- Are the data required to use this rule of thumb readily available?
- Does the rule of thumb provide reasonably accurate results?
- If more than one rule of thumb is available, which one appears to produce the most accurate estimate?
- Have technical experts or other buyers documented the results obtained from using the rule of thumb?

Example of Rule of Thumb Validation. You just received two offers for 500 laboratory tables. Each table is 4’ x 6’ (24 square feet of surface area), with an oak frame and legs. The work surface is a unique composite material developed to meet Government requirements. The low offer is $425; that offer is $175 less than the second low offer and $180 less than the Government estimate. As a result, you are concerned that the price may be unreasonably low. You have no acquisition history for this item and there are no similar items on the commercial market. As a result, you have been looking for a CER that you can use in your pricing decision. Another buyer, who has acquired similar tables, tells you that he has used a rule of thumb in pricing similar tables -- $19 per square feet of surface area. You want to know the answers to the following questions before you use it in making your own pricing decisions.

- Can the rule of thumb reasonably be used to estimate what you are trying to estimate (e.g., cost dollars, hours, or product price)?
The answer appears to be yes. The buyer who recommended the CER has used it successfully. Additional information shows that he learned of the CER from the scientists who developed the table-top material.

- **Are there other rules of thumb that can be used to estimate the same cost or price?**
  
  You have asked several "experts" and have been unable to identify any other rules of thumb for estimating the price of these unique tables.

- **Are the data required to use this rule of thumb readily available?**
  
  Yes, you already know the table surface area.

- **Does the rule of thumb provide reasonably accurate results?**
  
  You have identified four recent acquisitions of similar tables and recorded the following information comparing the estimates made using the rule of thumb and the actual prices paid:

<table>
<thead>
<tr>
<th>Sq Ft</th>
<th>Estimate</th>
<th>Actual Price</th>
<th>Percentage Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>$285</td>
<td>$310</td>
<td>+ 8.8%</td>
</tr>
<tr>
<td>18</td>
<td>$342</td>
<td>$335</td>
<td>- 2.0%</td>
</tr>
<tr>
<td>32</td>
<td>$608</td>
<td>$580</td>
<td>- 4.6%</td>
</tr>
</tbody>
</table>

This sample size is too small to perform an effective statistical analysis, but you can still subjectively evaluate rule of thumb estimate accuracy. All estimates are within 8.8 percent of the actual price. For a rule of thumb, this appears reasonably accurate, especially since our evaluation did not consider other acquisition situation differences (e.g., the number of tables on each contract).

- **If more than one rule of thumb is available, which one appears to produce the most accurate estimates?**
  
  In this example, there is only one known rule of thumb to consider.

- **Have technical experts or other buyers documented the results obtained from using the rule of thumb?**
  
  In this case, the buyer documented every contract file when the rule of thumb was used. Such documentation is not only valuable in supporting the contracting officer's decision on price reasonableness; it provides valuable information to any contracting officer considering rule of thumb use in the future.

*Example of Using a Rule of Thumb in Estimate Development.* Once you have determined that a rule of thumb is acceptable for estimate development, you must apply it to the available data. Using this rule of thumb, your estimate would be $456 (24 x $19). That estimate is about 7.3 percent higher than the low offer. Based on the rule of thumb, the price does not seem unreasonable.

### 4.3 - Developing And Using Estimating Factors

*Situations for Using Estimating Factors.* An estimating rate or factor is a simple ratio, used to estimate cost or price. The rule of thumb used to develop table price estimates in the previous section is an example -- $19 per square foot. As the size of the table top increases, the price estimate increases in direct proportion. Most rules of thumb are simple factors. Many CERs developed by Government or industry are also simple factors. They are relatively easy to develop, easy to understand, and in many cases quite accurate.

Development and use of estimating rates and factors involves two important implicit assumptions.

- There is no significant element of the cost or price being estimated that is not related to the independent variable (i.e., there is no "fixed cost" that is not associated with the independent variable).
- The relationship between the independent variable and the cost being estimated is linear.

If you believe that there are significant costs that cannot be explained by the relationship or that the relationship is not linear, you should either try to develop an equation that better tracks the true relationship or limit your use of the estimating factor to the range of the data used in developing the factor.
Example of Estimating Factor Development. Assume that you are negotiating a guard service contract for your facility and you want to develop a CER to assist you in estimating a should-pay contract price. Development should follow the 6-step CER process.

Step 1. Define the dependent variable. The objective is to develop an estimate of the price that the Government should expect to pay for this contract.

Step 2. Select independent variables to be tested for developing estimates of the dependent variable. Logically, the major driver of price in a guard service contract is the wages paid the security guards manning the various posts identified in the contract.

Step 3. Collect data concerning the relationship between the dependent and independent variables. You have collected information on prices, minimum manning requirements, and service contract wage-rate determinations for the guard service contract at your facility for the last three years. The minimum manning requirement for the current contract totals 75,000 (Guard II) hours. The Service Contract Act (SCA) wage rate for the current year is $10.00 per hour. The estimated direct labor cost for each year (Column D) is calculated by multiplying estimated direct labor hours (Column B) by the Service Contract Act wage rate (Column C).

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Estimated Direct Labor Hours</td>
<td>SCA Minimum Wage Rate</td>
<td>Estimated Direct Labor Cost</td>
<td>Contract Price</td>
</tr>
<tr>
<td>1</td>
<td>87,600</td>
<td>$9.15</td>
<td>$801,540</td>
<td>$1,346,585</td>
</tr>
<tr>
<td>2</td>
<td>78,840</td>
<td>$9.45</td>
<td>$745,038</td>
<td>$1,244,215</td>
</tr>
<tr>
<td>3</td>
<td>70,040</td>
<td>$9.50</td>
<td>$665,380</td>
<td>$1,124,490</td>
</tr>
<tr>
<td>Current</td>
<td>75,000</td>
<td>$10.00</td>
<td>$750,000</td>
<td></td>
</tr>
</tbody>
</table>

Step 4. Explore the relationship between the dependent and independent variables. The following table demonstrates calculation of the Price to Direct Labor Cost Ratio. The ratio (Column F) is calculated by dividing the contract price (Column E) by the estimated direct labor cost (Column D). In Year 1 for example, price was 1.68 times the estimated direct labor cost.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Estimated Direct Labor Hours</td>
<td>SCA Minimum Labor Rate</td>
<td>Estimated Direct Labor Cost</td>
<td>Contract Price</td>
<td>Price to Direct Labor Cost Ratio</td>
</tr>
<tr>
<td>1</td>
<td>87,600</td>
<td>$9.15</td>
<td>$801,540</td>
<td>$1,346,585</td>
<td>1.68</td>
</tr>
<tr>
<td>2</td>
<td>78,840</td>
<td>$9.45</td>
<td>$745,038</td>
<td>$1,244,215</td>
<td>1.67</td>
</tr>
<tr>
<td>3</td>
<td>70,040</td>
<td>$9.50</td>
<td>$665,380</td>
<td>$1,124,490</td>
<td>1.69</td>
</tr>
<tr>
<td>Current</td>
<td>75,000</td>
<td>$10.00</td>
<td>$750,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 5. Select the relationship that best predicts the dependent variable. It appears from the information above, that there is a relationship between contract price and the estimated direct labor cost. The price is between 1.67 and 1.69 times the estimated direct labor cost. The average ratio is 1.68.

Average Ratio = (1.68 + 1.67 + 1.69) / 3
You can now use this ratio to estimate the price of similar contracts.

**Step 6. Document your findings.** Your documentation of CER development should include the information from the 6-step process above. Exact documentation requirements will vary with the analysis involved.

**Using an Estimating Factor in Estimated Development.** Once you calculate an estimating factor, you can use it to estimate should-pay price for similar products. Using the 1.68 factor from the guard contract example, you can calculate a should-pay price for the current year. Using this factor, the best estimate of a reasonable price would be $1,260,000, as shown in the table below:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Estimated Direct Labor Hours</td>
<td>SCA Minimum Labor Rate</td>
<td>Estimated Direct Labor Cost</td>
<td>Contract Price</td>
<td>Price to Direct Labor Cost Ratio</td>
</tr>
<tr>
<td>Curr</td>
<td>75,000</td>
<td>$10.00</td>
<td>$750,000</td>
<td>$1,260,000</td>
<td>1.68</td>
</tr>
</tbody>
</table>

Given the data above, you should be reasonably confident of your estimate, because the range of ratios is only from 1.67 to 1.69. Even without statistical analysis, that range might be useful in establishing a range of reasonable prices.

- High side: $1.69 \times $750,000 = $1,267,500
- Mean: $1.68 \times $750,000 = $1,260,000
- Low side: $1.67 \times $750,000 = $1,252,500

### 4.4 - Developing And Using Estimating Equations

**Situations for Using Estimating Equations.** Not all estimating relationships lend themselves to the use of simple estimating factors. If there is a substantial element of the cost or price being estimated that is not related to the independent variable (i.e., there is a “fixed cost” that is not associated with the independent variable), you should consider using a linear estimating equation. If the relationship is not linear, consider a nonlinear estimating equation.

**Example of Estimating Equation Development.** Assume that you are analyzing the costs proposed for the construction of a new house and decide to develop a CER to support your analysis. Development should follow the 6-step CER process described in the chapter Introduction.

**Step 1. Define the dependent variable.** The objective is to estimate the cost of a new base housing model.

**Step 2. Select independent variables to be tested for developing estimates of the dependent variable.** A variety of house characteristics could be used to estimate cost. These include such characteristics as square feet of living area, exterior wall surface area, number of baths, and others.

**Step 3. Collect data concerning the relationship between the dependent and independent variables.**

<table>
<thead>
<tr>
<th>Base Housing Model</th>
<th>Unit Cost</th>
<th>Baths</th>
<th>Sq. Ft. Living Area</th>
<th>Sq. Ft. Exterior Wall Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burger</td>
<td>$166,500</td>
<td>2.5</td>
<td>2,800</td>
<td>2,170</td>
</tr>
<tr>
<td>Metro</td>
<td>$165,000</td>
<td>2.0</td>
<td>2,700</td>
<td>2,250</td>
</tr>
<tr>
<td>Suburban</td>
<td>$168,000</td>
<td>3.0</td>
<td>2,860</td>
<td>2,190</td>
</tr>
<tr>
<td>Executive</td>
<td>$160,500</td>
<td>2.0</td>
<td>2,440</td>
<td>1,990</td>
</tr>
<tr>
<td>Ambassador</td>
<td>$157,000</td>
<td>2.0</td>
<td>1,600</td>
<td>1,400</td>
</tr>
</tbody>
</table>
Step 4. Explore the relationship between the dependent and independent variables. Analysis of the relationship between the independent variable and house price could be performed using many different techniques. In this situation most analysts would use regression analysis. However, here we will use graphic analysis to demonstrate the thought process involved. Three independent variables will be tested: number of baths, living area, and exterior wall surface area.

**Price and the Number Of Baths.** This graph appears to demonstrate that the number of baths is not a good estimating tool, because three houses with a nearly $8,000 price difference have the same number of baths.

**Price and Square Feet Of Living Area.** This graph appears to depict a relationship.

**Price and Exterior Wall Surface Area.** This graph also appears to depict a relationship.
Step 5. Select the relationship that best predicts the dependent variable. Based on the initial analysis, it appears that square feet of living area and exterior wall surface have the most potential for development of a CER. The two graphs below depict efforts to fit a straight line through the observed values. Note that both graphs demonstrate efforts to fit a line with and without using the data from the Ambassador model.

**Price and Living Area.**

**Price and Exterior Wall Surface Area.**
Consider Analysis Results and Other Data. Viewing both of these relationships, we might question whether the Ambassador model data should be included in developing our CER. In developing a CER, you need not use all available data if all data is not comparable. However, you should not eliminate data just to get a better looking relationship. After further analysis, we find that the Ambassador’s size is substantially different from the other houses for which we have data and the house for which we are estimating. This substantial difference in size might logically affect relative construction cost. Based on this information, you might decide not to consider the Ambassador data in CER development.

Final Analysis. If you exclude the Ambassador data, you find that the fit of a straight-line relationship of cost to the exterior wall surface is improved. The relationship between cost and square feet of living area is even closer, almost a straight line.

If you had to choose one relationship, you would probably select living area over exterior wall surface because living area has so much less variance from the trend line. Since the relationship between living area and price is so close, we can reasonably use it for our CER.

If the analysis of these relationships did not reveal a useful predictive relationship, you might consider combining two or more of the relationships already explored or exploring new relationships.

Step 6. Document your findings. In documenting our findings, we can relate the process involved in selecting living area for price estimation. We may then present the following graph developed as an estimating tool.
We might also convert the graphic relationship to an equation. The cost estimating relationship (CER) would be:

\[ Y = 117,750 + (17.50 \times \text{Sq Ft of Living Area}) \]

Using an Estimating Equation to Estimate Cost. Once developed, you can use an estimating equation to contract cost or price in similar circumstances.

For example: Applying our new CER to the estimation of cost for our new 2,600 square-foot house, we would estimate:

\[
Y = 117,750 + (17.50 \times 2,600) = 117,750 + 45,500 = 163,250 \text{ estimated price}
\]

CERs, like most other tools of cost analysis, MUST be used with judgment. Judgment is required to evaluate the historical relationships in the light of new technology, new design, and other similar factors. Therefore, knowledge of the factors involved in CER development is essential to proper application of the CER.

### 4.5 Identifying Issues And Concerns

**Questions to Consider in Analysis.** As you perform price or cost analysis, consider the issues and concerns identified in this section as you consider use of a cost estimating relationship.

- **Does the available information verify the existence and accuracy of the proposed relationship?**
  
  Technical personnel can be helpful in analyzing the technical validity of the relationship. Audit personnel can be helpful in verifying the accuracy of any contractor data and analysis.

- **Is there a trend in the relationship?**
  
  For example, the cost of rework is commonly estimated as a factor of production labor. As production continues, the production effort should become more efficient and produce fewer defective units which require repair. The factor should decrease over time. You should also consider the following related questions: Is the rate distorted by one bad run? What is being done to control the rate? What else can be done?

- **Is the CER used consistently?**
  
  If an offeror uses a CER to propose an element of cost, it should be used in all similar proposals. Since
the CER can be used to estimate the average value, some jobs should be expected to cost more and others less. With a valid CER, you assume the variances will be minor and will average out across all contracts. To use a CER in some cases and a discrete estimate in others destroys its usefulness by over or understating costs across all proposals (e.g., using the average unless a discrete estimate is lower/higher negates the averaging out of cost across all contracts and is clearly unfair to one of the contracting parties).

1. **Has the CER been consistently accurate in the past?**
   
   No matter how extensive the price/cost information or how sophisticated the analysis technique, if a CER does not do a good job of accurately projecting cost, then it is not a useful tool.

2. **How current is the CER?**
   
   Even the most accurate CER needs to be reviewed and updated. While the time interval between updates will differ with CER sensitivity to change, in general a CER should be reviewed and updated at least annually. A CER based on a moving average should be updated whenever new data become available.

3. **Would another independent variable be better for developing and applying a CER?**
   
   If another independent variable would consistently provide a more accurate estimate, then it should be considered. However, remember that the CER may be applicable to other proposals, not just yours. It is possible that a relationship which works well on your contract would not work well across the entire contract population. When assessing CER validity, you should consider all affected contracts.

4. **Is the CER a self-fulfilling prophecy?**
   
   A CER is intended to project future cost. If the CER simply “backs into” a rate that will spread the cost of the existing capacity across the affected contracts, then the CER is not fulfilling its principle function. If you suspect that a CER is being misused as a method of carrying existing resources, you should consider a should-cost type review on the functions represented by the CER.

5. **Would use of a detailed estimate or direct comparison with actual cost from a prior effort produce more accurate results?**
   
   Development of a detailed estimate can be time consuming and costly but the application of the engineering principles required is particularly valuable in estimating cost of efficient and effective contract performance.

5.0 - Chapter Introduction

5.1 - Identifying Situations For Use

5.2 - Developing And Using A Simple Regression Equation

5.3 - Analyzing Variation In The Regression Model

5.4 - Measuring How Well The Regression Equation Fits The Data

5.5 - Calculating And Using A Prediction Interval

5.6 - Identifying The Need For Advanced Regression Analysis

5.7 - Identifying Issues And Concerns

5.0 - Chapter Introduction

In this chapter, you will learn to use regression analysis in developing cost estimating relationships and other analyses based on a straight-line relationship even when the data points do not fall on a straight line.

**Line-of-Best-Fit.** The straight-line is one of the most commonly used and most valuable tools in both price and cost analysis. It is primarily used to develop cost estimating relationships and to project economic trends. Unfortunately, in contract pricing the data points that are used in analysis do not usually fall exactly on a straight line. Much of the variation in a dependent variable may be explained by a linear relationship with an independent variable, but there are usually random variations that cannot be explained by the line. The goal in establishing a line-of-best-fit is to develop a predictive relationship that minimizes the random variations. This can be done visually with a graph and a ruler, but the visual line-of-best-fit is an inexact technique and has limited value in cost or price analysis. Regression analysis is commonly used to analyze more complex relationships and provide more accurate results.

This chapter will focus on simple regression (2-variable linear regression); in which a single independent variable (X) is used to predict the value of a single dependent variable (Y). The dependent variable will normally be either price or cost (e.g., dollars or labor hours), the independent variable will be a measure related to the product (supply or service) being acquired. It may be a physical characteristic of the
product, a performance characteristic of the product, or an element of cost to provide the product. In some situations, you may need regression analysis tools that are more powerful than simple regression. Multiple regression (multivariate linear regression) and curvilinear regression are variations of simple regression that you may find useful. The general characteristics of both will be addressed later in the chapter.

5.1 - Identifying Situations For Use

**Cost Estimating Relationship Development and Analysis.** Regression analysis is one of the techniques most commonly used to establish cost estimating relationships (CERs) between independent variables and cost or price. If you can use regression analysis to quantify a CER, you can then use that CER to develop and analyze estimates of product cost or price.

**Indirect Cost Rate Analysis (FAR 31.203).** Indirect costs are costs that are not directly identified with a single final cost objective (e.g., a contract), i.e., indirect costs are identified with two or more final cost objectives or an intermediate cost objective(s). Minor direct costs may be treated as indirect costs if the treatment is consistently applied to all final cost objectives and the allocation produces substantially the same results as treating the cost as a direct cost. **FAR 31.203** requires that indirect costs be accumulated into logical cost pools and allocated to final cost objectives on the basis of the benefits accruing to the various cost objectives.

Regression analysis is commonly used to quantify the relationship between the indirect cost allocation base and expense pool over time. If you can quantify the relationship, you can then use that relationship to develop or analyze indirect cost rate estimates.

**Time-Series Analysis.** You can use regression analysis to analyze trends that appear to be related to time. It is particularly useful when you can identify and adjust for other factors that affect costs or prices (e.g., quantity changes) to isolate the effect of inflation/deflation for analysis. The most common applications of this type are forecasting future wage rates, material costs, and product prices. In time-series analysis, cost or price data are collected over time for analysis. An estimating equation is developed using time as the independent variable. The time periods are normally weeks, months, quarters, or years. Each time period is assigned a number (e.g., the first month is 1, the fourth month is 4, etc.). All time periods during the analysis must be considered, whether or not data were collected during that period.

Time does not cause costs or prices to change. Changes are caused by a variety of economic factors. Do not use time-series analysis when you can identify and effectively measure the factors that are driving costs or prices. If you can identify and measure one or more key factors, you should be able to develop a better predictive model than by simply analyzing cost or price changes over time. However, if you cannot practically identify or measure such factors, you can often make useful predictions by using regression analysis to analyze cost or price trends over time.

Just remember that regression analysis will not automatically identify changes in a trend (i.e., it cannot predict a period of price deflation when the available data trace a trend of increasing prices). As a result, regression analysis is particularly useful in short-term analysis. The further you predict into the future, the greater the risk.

5.2 - Developing And Using A Simple Regression Equation

**Simple Regression Model.** The simple regression model is based on the equation for a straight line:

\[ Y_c = A + BX \]

Where:

- \( Y_c \) = The calculated or estimated value for the dependent (response) variable
- \( A \) = The Y intercept, the theoretical value of Y when X = 0
- \( X \) = The independent (explanatory) variable
- \( B \) = The slope of the line (the change in Y divided by the change in X, i.e., the value by which Y changes when X changes by one).

For a given data set, A and B are constants. They do not change as the value of the independent variable changes. \( Y_c \) is a function of X. Specifically, the functional relationship between \( Y_c \) and X is that \( Y_c \) is equal to A plus the product of B times X.

The following figure graphically depicts the regression line:
Steps for Developing a 2-Variable Linear Regression Equation. To develop a regression equation for a particular set of data, use the following 5-step least-squares-best-fit (LSBF) process:

**Step 1. Collect the historical data required for analysis.** Identify the X and Y values for each observation.

- X = Independent variable
- Y = Dependent variable

**Step 2. Put the data in tabular form.**

**Step 3. Compute \( \bar{X} \) and \( \bar{Y} \).**

\[
\bar{X} = \frac{\sum X}{n} \quad \bar{Y} = \frac{\sum Y}{n}
\]

Where:
- \( \bar{X} \) = Sample mean for observations the independent variable
- \( \bar{Y} \) = Sample mean for observations the dependent variable
- \( \Sigma \) = Summation of all the variables that follow the symbol (e.g., \( \Sigma X \) represents the sum of all X values)
- X = Observation value for the independent variable
- Y = Observation value for the dependent variable
- n = Total number of observations in the sample

**Step 4. Compute the slope (B) and the Y intercept (A).**

\[
B = \frac{\sum XY - n \bar{X} \bar{Y}}{\sum X^2 - n(\bar{X})^2}
\]

\[
A = \bar{Y} - B\bar{X}
\]

**Step 5. Formulate the estimating equation.**

\[ Y_c = A + BX \]

2-Variable Linear Regression Equation Development Example. Assume a relationship between a firm’s direct labor hours and manufacturing overhead cost based on the use of direct labor hours as the allocation base for manufacturing overhead. Develop an estimating equation using direct labor hours as the independent variable and manufacturing overhead cost as the dependent variable. Estimate the indirect cost pool assuming that 2,100 manufacturing direct labor hours will be needed to meet 20X8 production requirements.
Step 1. Collect the Historical Data Required for Analysis.

<table>
<thead>
<tr>
<th>Year</th>
<th>Manufacturing Direct Labor Hours</th>
<th>Manufacturing Overhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>20X2</td>
<td>1,200</td>
<td>$73,000</td>
</tr>
<tr>
<td>20X3</td>
<td>1,500</td>
<td>$97,000</td>
</tr>
<tr>
<td>20X4</td>
<td>2,300</td>
<td>$128,000</td>
</tr>
<tr>
<td>20X5</td>
<td>2,700</td>
<td>$155,000</td>
</tr>
<tr>
<td>20X6</td>
<td>3,300</td>
<td>$175,000</td>
</tr>
<tr>
<td>20X7</td>
<td>3,400</td>
<td>$218,000</td>
</tr>
<tr>
<td>20X8</td>
<td>2,100 (Est)</td>
<td></td>
</tr>
</tbody>
</table>

Step 2. Put The Data In Tabular Form.
X = Manufacturing direct labor hours in hundreds of hours (00s)
Y = Manufacturing overhead in thousands of dollars ($000s)

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>XY</th>
<th>X²</th>
<th>Y²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>73</td>
<td>876</td>
<td>144</td>
<td>5,329</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>97</td>
<td>1,455</td>
<td>225</td>
<td>9,409</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>128</td>
<td>2,944</td>
<td>529</td>
<td>16,384</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>155</td>
<td>4,185</td>
<td>729</td>
<td>24,025</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>175</td>
<td>5,775</td>
<td>1,089</td>
<td>30,625</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>218</td>
<td>7,412</td>
<td>1,156</td>
<td>47,524</td>
</tr>
<tr>
<td>Column Totals</td>
<td>144</td>
<td>846</td>
<td>22,647</td>
<td>3,872</td>
<td>133,296</td>
</tr>
</tbody>
</table>

Step 3. Compute \( \bar{X} \) and \( \bar{Y} \).
\[
\bar{X} = \frac{\sum X}{n} = \frac{144}{6} = 24
\]
\[
\bar{Y} = \frac{\sum Y}{n} = \frac{846}{6} = 141
\]

Step 4. Compute the slope (B) and the intercept (A).
Step 5. Formulate the estimating equation. Substitute the calculated values for A and B into the equation:

\[
Y = A + BX
\]

\[
= 5.8272 + 5.6322X
\]

Where:

\[Y_c = \text{Manufacturing overhead (}$000's)\]
\[X = \text{Manufacturing direct labor hours (00's)}\]

Example of Estimate Using Simple Regression Equation. Estimate manufacturing overhead given an estimate for manufacturing direct labor hours of 2,100:

\[
Y_c = 5.8272 + 5.622X
\]
\[
= 5.8272 + 5.622(21)
\]
\[
= 5.8272 + 118.2762
\]
\[
= 124.1034 \text{ thousand dollars}
\]

Rounded to the nearest dollar, the estimate would be $124,103.

5.3 - Analyzing Variation In The Regression Model

Assumptions of the Regression Model. The assumptions listed below enable us to calculate unbiased estimators of the population and to use these in predicting values and regression function coefficients (of \(Y\) given \(X\)). You should be aware of the fact that violation of one or more of these assumptions reduces the efficiency of the model, but a detailed discussion of this topic is beyond the purview of this text. Assume that all these assumptions have been met.

- For each value of \(X\) there is an array of possible \(Y\) normally distributed about the regression line.
- The mean of the distribution of possible \(Y\) values is on the regression line, i.e., the expected value of the error term is zero.
- The standard deviation of the distribution of possible \(Y\) values is constant regardless of the value of \(X\) (this is called homoscedasticity).
- The error terms are statistically independent of each other, i.e., there is no serial correlation.
- The error term is statistically independent of \(X\).

Note: These assumptions are very important, in that they enable us to construct predictions around our point estimate.

Variation in the Regression Model. Recall that the purpose of regression analysis is to predict the value of a dependent variable given the value of the independent variable. The LSBF technique yields the best single line to fit the data, but you also want some method of determining how good this estimating equation is. In order to do this, you must first partition the variation.
• **Total Variation.** The sum of squares total (SST) is a measure of the total variation of Y. SST is the sum of the squared differences between the observed values of Y and the mean of Y.

\[ \text{SST} = \Sigma(Y_i - \bar{Y})^2 \]

Where:

- SST = Sum of squared differences
- \( Y_i \) = Observed value i
- \( \bar{Y} \) = Mean value of Y

While the above formula provides a clear picture of the meaning of SST, you can use the following formula to speed SST calculation:

\[ \text{SST} = \Sigma Y^2 - \bar{Y} \Sigma Y \]

Total variation can be partitioned into two variations categories: explained and unexplained. This can be expressed as

\[ \text{SST} = \text{SSR} + \text{SSE} \]

• **Explained Variation.** The sum of squares regression (SSR) is a measure of variation of Y that is explained by the regression equation. SSR is the sum of the squared differences between the calculated value of Y (\( Y_c \)) and the mean of Y (\( \bar{Y} \)).

\[ \text{SSR} = \Sigma(Y_c - \bar{Y})^2 \]

You can use the following formula to speed SSR calculation:

\[ \text{SSR} = B(\Sigma XY - \bar{X}\Sigma Y) \]

• **Unexplained Variation.** The sum of squares error (SSE) is a measure of the variation of Y that is not explained by the regression equations. SSE is the sum of the squared differences between the observed values of Y and the calculated value of Y. This is the random variation of the observations around the regression line.

\[ \text{SSE} = \Sigma(Y_i - Y_c)^2 \]

You can use the following formula to speed SSE calculation:

\[ \text{SSE} = \Sigma Y^2 - A\Sigma Y - B\Sigma XY \]

**Analysis of Variance.** Variance is equal to variation divided by degrees of freedom (df). In regression analysis, df is a statistical concept that is used to adjust for sample bias in estimating the population mean.

• **Mean Square Regression (MSR).**

\[ \text{MSR} = \frac{\text{SSR}}{df} \]

For 2-variable linear regression, the value of df for calculating MSR is always one (1). As a result, in 2-variable linear regression, you can simplify the equation for MSR to read:

\[ \text{MSR} = \frac{\text{SSR}}{1} \]

\[ \text{MSR} = \text{SSR} \]

• **Mean Square Error (MSE).**

\[ \text{MSE} = \frac{\text{SSE}}{df} \]

In 2-variable linear regression, df for calculating MSE is always \( n - 2 \). As a result, in simple regression, you can simplify the equation for MSE to read:

\[ \text{MSE} = \frac{\text{SSE}}{n - 2} \]

• **Analysis of Variance Table.** The terms used to analyze variation/variance in the regression model are commonly summarized in an Analysis of Variance (ANOVA) table.

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square**</th>
</tr>
</thead>
</table>

**ANOVA Table**
Constructing an ANOVA Table for the Manufacturing Overhead Example. Before you can calculate variance and variation, you must use the observations to calculate the statistics in the table below. Since we already calculated these statistics to develop the regression equation to estimate manufacturing overhead, we will begin our calculations with the values in the table below:

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>?</td>
<td>144</td>
</tr>
<tr>
<td>?Y</td>
<td>846</td>
</tr>
<tr>
<td>?XY</td>
<td>22,647</td>
</tr>
<tr>
<td>?X²</td>
<td>3,872</td>
</tr>
<tr>
<td>?Y²</td>
<td>133,296</td>
</tr>
<tr>
<td>X̄</td>
<td>24</td>
</tr>
<tr>
<td>Ȳ</td>
<td>141</td>
</tr>
<tr>
<td>A</td>
<td>5.8272</td>
</tr>
<tr>
<td>B</td>
<td>5.6322</td>
</tr>
<tr>
<td>n</td>
<td>6</td>
</tr>
</tbody>
</table>

**Step 1. Calculate SST.**

\[
SST = \sum Y^2 - \bar{Y} \sum Y
\]

\[
= 133,296 - 141(846)
\]

\[
= 133,296 - 119,286
\]

\[
= 14,010
\]

**Step 2. Calculate SSR.**

\[
SSR = B(\sum XY - \bar{X} \bar{Y})
\]

\[
= 5.6322 \times [22,647 - 24(846)]
\]

\[
= 5.622 \times [22,647 - 20,304]
\]

\[
= 5.6322 \times [2,343]
\]

\[
= 13,196.24 \text{ (rounded to 13,196 for this example)}
\]

**Step 3. Calculate SSE.**

\[
SSE = \sum Y^2 - A \sum Y - B \sum XY
\]

\[
= 133,296 - 5.8272(846) - 5.6322(22,647)
\]

\[
= 133,296 - 4929.81 - 127,552.43
\]

\[
= 813.76 \text{ (rounded to 814 for this example)}
\]

**Step 4. Calculate MSR.**
Step 5. Calculate MSE.

\[
\text{MSE} = \frac{\text{SSE}}{n - 2} = \frac{814}{6 - 2} = \frac{814}{4} = 203.5 \text{ (rounded to 204 for this example)}
\]

Step 6. Combine the calculated values into an ANOVA table.

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>13,196</td>
<td>1</td>
<td>13,196</td>
</tr>
<tr>
<td>Error</td>
<td>814</td>
<td>4</td>
<td>204</td>
</tr>
<tr>
<td>Total</td>
<td>14,010</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Mean Square = Sum of Squares/df

Step 7. Check SST. Assure that value for SST is equal to SSR plus SSE.

\[
\text{SST} = \text{SSR} + \text{SSE} \\
14,010 = 13,196 + 814 \\
14,010 = 14,010
\]

5.4 - Measuring How Well The Regression Equation Fits The Data

Statistics Used to Measure Goodness of Fit. How well does the equation fit the data used in developing the equation? Three statistics are commonly used to determine the “goodness of fit” of the regression equation:

- Coefficient of determination;
- Standard error of the estimate; and
- T-test for significance of the regression equation.

Calculating the Coefficient of Determination. Most computer software designed to fit a line using regression analysis will also provide the coefficient of determination for that line. The coefficient of determination \(r^2\) measures the strength of the association between independent and dependent variables (X and Y).

The range of \(r^2\) is between zero and one.

\(0 < r^2 < 1\)

An \(r^2\) of zero indicates that there is no relationship between X and Y. An \(r^2\) of one indicates that there is a perfect relationship between X and Y. As \(r^2\) gets closer to 1, the better the regression line fits the data set. In fact, \(r^2\) is the ratio of explained variation (SSR) to total variation (SST). An \(r^2\) of .90 indicates that 90 percent of the variation in Y has been explained by its relationship with X; that is, 90 percent of the variation in Y has been explained by the regression line.

\[
r^2 = \frac{\text{SSR}}{\text{SST}}
\]
For the manufacturing overhead example:

\[ r^2 = \frac{13,196}{14,010} = .94 \]

This means that approximately 94% of the variation in manufacturing overhead (Y) can be explained by its relationship with manufacturing direct labor hours (X).

**Standard Error of the Estimate.** The standard error of the estimate (SEE) is a measure of the accuracy of the estimating (regression) equation. The SEE indicates the variability of the observed (actual) points around the regression line (predicted points). That is, it measures the extent to which the observed values (Yi) differ from their calculated values (Yc). Given the first two assumptions required for use of the regression model (for each value of X there is an array of possible Y values which is normally distributed about the regression line and the mean of this distribution (Yc) is on the regression line), the SEE is interpreted in a way similar to the way in which the standard deviation is interpreted. That is, given a value for X, we would generally expect the following intervals (based on the Empirical Rule):

- Yc = 1 SEE contains approximately 68 percent of the total observations (Yi)
- Yc = 2 SEE contains approximately 95 percent of the total observations (Yi)
- Yc = 3 SEE contains approximately 99 percent of the total observations (Yi)

The SEE is equal to the square root of the MSE.

For the manufacturing overhead example:

\[ \text{SEE} = \sqrt{204} = 14.28 \]

**Steps for Conducting the T-test for the Significance of the Regression Equation.** The regression line is derived from a sample. Because of sampling error, it is possible to get a regression relationship with a rather high \( r^2 \) (e.g. greater than 80 percent) when there is no real relationship between X and Y. That is, when there is no statistical significance. This phenomenon will occur only when you have very small sample data sets. You can test the significance of the regression equation by applying the T-test.

Applying the T-test is a 4-step process:

**Step 1. Determine the significance level (\( \alpha \)).**

\( \alpha = 1 \) - confidence level

The selection of the significance level is a management decision; that is, management decides the level of risk associated with an estimate which it will accept. In the absence of any other guidance, use a significance level of .10.

**Step 2. Calculate T.** Use the values of MSR and MSE from the ANOVA table:

\[ T = \frac{\text{MSR}}{\sqrt{\text{MSE}}} \]

**Step 3. Determine the table value of t.** From a t Table, select the t value for the appropriate degrees of freedom (df). In 2-variable linear regression:

\[ \text{df} = n - 2 \]

**Step 4. Compare T to the t Table value.** Decision rules:

- If \( T > t \), use the regression equation for prediction purposes. It is likely that the relationship is significant.
- If \( T < t \), do not use the regression equation for prediction purposes. It is likely that the relationship is not significant.
- If \( T = t \), a highly unlikely situation, you are theoretically indifferent and may elect to use or not use the regression equation for prediction purposes.

**Conducting the T-test for the Significance of the Regression Equation for the Manufacturing Overhead Example.**

To demonstrate use of the T-test, we will apply the 4-step procedure to the manufacturing overhead example:

**Step 1. Determine the significance level (\( \alpha \)).** Assume that we have been told to use \( \alpha = .05 \).

**Step 2. Calculate T.**
Step 3. Determine the table value of $t$. The partial table below is an excerpt of a $t$ table.

\[ df = n - 2 \]

\[ = 6 - 2 \]

\[ = 4 \]

<table>
<thead>
<tr>
<th>df</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4.303</td>
</tr>
<tr>
<td>3</td>
<td>3.182</td>
</tr>
<tr>
<td>4</td>
<td>2.776</td>
</tr>
<tr>
<td>5</td>
<td>2.571</td>
</tr>
<tr>
<td>6</td>
<td>2.447</td>
</tr>
</tbody>
</table>

Reading from the table, the appropriate value is 2.776.

Step 4. Compare $T$ to the $t$ Table value. Since $T (8.043) > t (2.776)$, use the regression equation for prediction purposes. It is likely that the relationship is significant.

Note: There is not normally a conflict in the decision indicated by the $T$-test and the magnitude of $r^2$. If $r^2$ is high, $T$ is normally $> t$. A conflict could occur only in a situation where there are very few data points. In those rare instances where there is a conflict, you should accept the decision indicated by the $T$-test. It is a better indicator than $r^2$ because it takes into account the sample size ($n$) through the degrees of freedom ($df$).

5.5 - Calculating And Using A Prediction Interval

Formulating the Prediction Interval. You can develop a regression equation and use it to calculate a point estimate for $Y$ given any value of $X$. However, a point estimate alone does not provide enough information for sound negotiations. You need to be able to establish a range of values which you are confident contains the true value of the cost or price which you are trying to predict. In regression analysis, this range is known as the prediction interval.

For a regression equation based on a small sample, you should develop a prediction interval, using the following equation:
When $X = 21$ the prediction interval is $80.9207 \leq Y \leq 167.2861$

Constructing a Prediction Interval for the Manufacturing Overhead Example. Assume that we want to construct a 95 percent prediction interval for the manufacturing overhead estimate at 2,100 manufacturing direct labor hours. Earlier in the chapter, we calculated $Y_c$ and the other statistics in the following table:

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Y_c$</td>
<td>124.1034</td>
</tr>
<tr>
<td>$t$ (Use $n - 2$ df)</td>
<td>2.776</td>
</tr>
<tr>
<td>SEE</td>
<td>14.27</td>
</tr>
<tr>
<td>$\bar{X}$</td>
<td>24</td>
</tr>
<tr>
<td>$\sum X^2$</td>
<td>3,872</td>
</tr>
</tbody>
</table>

Using the table data, you would calculate the prediction interval as follows: When $X = 21$ the prediction interval is: $80.9207 \leq Y \leq 167.2861$.

**Prediction Statement:** We would be 95 percent confident that the actual manufacturing overhead will be between $80,921$ and $167,286 at 2,100 manufacturing direct labor hours.

---

5.6 - Identifying The Need For Advanced Regression Analysis

Other Forms of Regression. In 2-variable regression analysis, you use a single independent variable ($X$) to estimate the dependent variable ($Y$), and the relationship is assumed to form a straight line. This is the most common form of regression analysis used in contract pricing. However, when you need more than one independent variable to estimate cost or price, you should consider multiple regression (or multivariate linear regression). When you expect that a trend line will be a curve instead of a straight line, you should consider curvilinear regression.

A detailed presentation on how to use multiple regression or curvilinear regression is beyond the scope of this text. However, you should have a general understanding of when and how these techniques can be applied to contract pricing. When you identify a situation that seems to call for the use of one of these techniques, consult an expert for the actual analysis. You can obtain more details on the actual use of these techniques from advanced forecasting texts.

**Multiple Regression Situation.** Multiple regression analysis assumes that the change in $Y$ can be better explained by using more than one independent variable. For example, suppose you want to determine the relationship between main-frame computer hours, field-audit hours expended in audit analysis, and the cost reduction recommendations sustained during contract negotiations.
### Three-Variable Linear Equation

Multiple regression can involve any number of independent variables. To solve the audit example above, we would use a three-variable linear equation — two independent variables and one dependent variable.

\[ Y_c = A + B_1X_1 + B_2X_2 \]

Where:

- \( Y_c \) = The calculated or estimated value for the dependent (response) variable
- \( A \) = The Y intercept, the value of Y when \( X_1 = 0 \) and \( X_2 = 0 \)
- \( X_2 \) = The first independent (explanatory) variable
- \( B_2 \) = The slope of the line related to the change in \( X_1 \), the value by which \( Y \) changes when \( X_1 \) changes by one.
- \( X_2 \) = The second independent (explanatory) variable
- \( B_2 \) = The slope of the line related to the change in \( X_2 \), the value by which \( Y \) changes when \( X_2 \) changes by one.

### Results of Audit Data Three-Variable Linear Regression Analysis

Using the above data on audit analysis and negotiated reductions, an analyst identified the following three variables:

- \( X_2 \) = Computer Hours
- \( X_2 \) = Field Audit Hours
- **Y** = Cost Reductions Sustained

The results of analysts analysis are shown in the following table:

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Equation</th>
<th>( r^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Hours</td>
<td>( Y = A + B X_1 )</td>
<td>.82</td>
</tr>
<tr>
<td>Field Audit Hours</td>
<td>( Y = A + B X_2 )</td>
<td>.60</td>
</tr>
<tr>
<td>Comp Hrs and Field Audit Hrs</td>
<td>( Y = A + B_1X_1 + B_2X_2 )</td>
<td>.88</td>
</tr>
</tbody>
</table>

You can see from the \( r^2 \) values in the above table that computer hours explains more of the variation in...
cost reduction recommendations sustained than is explained by field audit hours. If you had to select one independent variable, you would likely select Computer Hours. However, the combination of the two independent variables in multiple regression explains more of the variation in cost reduction recommendations sustained than the use of computer hours alone. The combination produces a stronger estimating tool.

Curvilinear Regression Analysis. In some cases, the relationship between the independent variable(s) may not be linear. Instead, a graph of the relationship on ordinary graph paper would depict a curve. You cannot directly fit a line to a curve using regression analysis. However, if you can identify a quantitative function that transforms a graph of the data to a linear relationship, you can then use regression analysis to calculate a line of best fit for the transformed data.

<table>
<thead>
<tr>
<th>Common Transformation Functions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reciprocal</td>
<td>( \frac{1}{X} )</td>
</tr>
<tr>
<td>Square Root</td>
<td>( \sqrt{X} )</td>
</tr>
<tr>
<td>Log-Log</td>
<td>( \log X )</td>
</tr>
<tr>
<td>Power</td>
<td>( X^2 )</td>
</tr>
</tbody>
</table>

For example, improvement curve analysis (presented later in this text) uses a special form of curvilinear regression. While it can be used in price analysis and material cost analysis, the primary use of the improvement curve is to estimate labor hours. The curve assumes that less cost is required to produce each unit as the total units produced increases. In other words, the firm becomes more efficient as the total units produced increases.

There are many improvement curve formulations but one of the most frequently used is:

\[ Y = AX^B \]

Where:
- \( Y \) = Unit cost (in hours or dollars of the Xth unit)
- \( X \) = Unit number
- \( A \) = Theoretical cost of the first unit
- \( B \) = Constant value related to the rate of efficiency improvement

Obviously, this equation does not describe a straight line. However, using the logarithmic values of \( X \) and \( Y \) (log-log transformation), we can transform this curvilinear relationship into a linear relationship for regression analysis. The result will be an equation in the form:

\[ \log Y = \log A + B \log X \]

Where:
- \( \log Y \) = The logarithmic value of \( Y \)
- \( \log A \) = The logarithmic value of \( A \)
- \( \log X \) = The logarithmic value of \( X \)

We can then use the linear equation to estimate the logarithmic value of \( Y \), and from that \( Y \).

---

**5.7 - Identifying Issues And Concerns**

*Questions to Consider in Analysis.* As you perform price/cost analysis, consider the issues and concerns identified in this section, whenever you use regression analysis.

- **Does the \( r^2 \) value indicate a strong relationship between the independent variable and the dependent variable?**

The value of \( r^2 \) indicates the percentage of variation in the dependent variable that is explained by the
independent variable. Obviously, you would prefer an $r^2$ of .96 over an $r^2$ of .10, but there is no magic cutoff for $r^2$ that indicates that an equation is or is not acceptable for estimating purposes. However, as the $r^2$ becomes smaller, you should consider your reliance on any prediction accordingly.

- **Does the T-test for significance indicate that the relationship is statistically significant?**
  
  Remember that with a small data set, you can get a relatively high $r^2$ when there is no statistical significance in the relationship. The T-test provides a baseline to determine the significance of the relationship.

- **Have you considered the prediction interval as well as the point estimate?**
  
  Many estimators believe that the point estimate produced by the regression equation is the only estimate with which they need to be concerned. The point estimate is only the most likely estimate. It is part of a range of reasonable estimates represented by the prediction interval. The prediction interval is particularly useful in examining risk related to the estimate. A wide interval represents more risk than a narrow interval. This can be quite valuable in making decisions such as contract type selection. The prediction interval can also be useful in establishing positions for negotiation. The point estimate could be your objective, the lower limit of the interval your minimum position, and the upper limit your maximum position.

- **Are you within the relevant range of data?**
  
  The size of the prediction interval increases as the distance $\bar{x}$ from increases. You should put the greatest reliance on forecasts made within the relevant range of existing data. For example, 12 is within the relevant range when you know the value of $Y$ for several values of $X$ around 12 (e.g., 10, 11, 14, and 19).

- **Are time series forecasts reasonable given other available information?**
  
  Time series forecasts are all outside the relevant range of known data. The further you estimate into the future, the greater the risk. It is easy to extend a line several years into the future, but remember that conditions change. For example, the low inflation rates of the 1960s did not predict the hyper-inflation of the 1970s. Similarly, inflation rates of the 1970s did not predict inflation rates of the 1980s and 90s.

- **Is there a run of points in the data?**
  
  A run consisting of a long series of points which are all above or all below the regression line may occur when historical data are arranged chronologically or in order of increasing values of the independent variable. The existence of such runs may be a symptom of one or more of the following problems:

  - Some factor not considered in the regression analysis is influencing the regression equation (consider multivariate regression);
  - The equation being used in the analysis does not truly represent the underlying relationship between the variables;
  - The data do not satisfy the assumption of independence; or
  - The true relationship may be curvilinear instead of linear (consider curvilinear regression).

- **Have you graphed the data to identify possible outliers or trends that cannot be detected through the mathematics of fitting a straight line?**
  
  When you use 2-variable linear regression, you will fit a straight line through the data. However, the value of the relationship identified may be affected by one or more outliers that should not really be considered in your analysis. These can be easily identified through the use of a graph. Remember though, you cannot discard a data point simply because it does not fit on the line. The graph will help you identify an outlier, but you cannot discard it unless there is a valid reason (e.g., different methods were used for that item).

  A graph can also permit you to identify situations where a single simple regression equation is not the best predictor. The graph may reveal that there is more than one trend affecting the data (e.g., the first several data points could indicate an upward trend, the latter data points a downward trend). It could also reveal the true relationship is a curve and not a straight line.

- **Have you analyzed the differences between the actual and predicted values?**
  
  Like the graph, this analysis will provide you information useful in identifying outliers (e.g., there may be
one very large variance affecting the relationship). However, the outlier may not be as easy to identify as with a graph because the line will be pulled toward the outlier.

- **Are you comparing apples with apples?**
Regression analysis, like any technique based on historical data, assumes that the past is a good predictor of the future. For example, you might establish a strong relationship between production labor hours and quality assurance labor hours. However, if either production methods or quality assurance methods change substantially (e.g., automation) the relationship may no longer be of any value.

- **How current are the data used to develop the estimating equation?**
The more recent the data, the more valuable the analysis. Many things may have changed since the out-of-date data were collected.

- **Would another independent variable provide a better estimating tool?**
Another equation may produce a better estimating tool. As stated above, you would likely prefer an equation with an $r^2$ of .96 over one with an $r^2$ of .10.

- **Does the cost merit a more detailed cost analysis?**
If the cost is high and the $r^2$ is low, it may merit a more detailed analysis. For example, if you had a relatively low $r^2$ for a production labor effort, it may be worth considering the use of work measurement techniques in your analysis.

- 6.0 - Chapter Introduction
- 6.1 - Identifying Situations For Use
- 6.2 - Determining Which Moving Average Model To Use
- 6.3 - Evaluating And Using Single Moving Averages
- 6.4 - Evaluating And Using Double Moving Averages
- 6.5 - Identifying Issues And Concerns

6.0 - Chapter Introduction
In this chapter, you will learn to use moving averages to estimate and analyze estimates of contract cost and price.

*Single Moving Average.* If you cannot identify or you cannot measure an independent variable that you can use to estimate a particular dependent variable, your best estimate is often an average (mean) of past observations. The single moving average builds on this principle by defining the number of observations that you will consider. It assumes that the recent past is the best predictor of the future. In a single moving average, data collected over two or more time periods (normally at least three) are summed and divided by the number of time periods. That average then becomes a forecast for future time periods. As data from a new time period is added, data from an earlier time period is dropped from the average calculation. For example, a 12-month moving average uses data from the most recent 12 months. A 6-month moving average uses data from the most recent six months. You must determine the appropriate number of time periods to consider in the analysis. You can use any time period, but monthly data is the most common.

*Double Moving Average.* If you believe that there is a trend in the data, you can use a double moving average. A trend in the data means that the observation values tend to either increase or decrease over time. A double moving average requires that you calculate a moving average and then calculate a second moving average using the averages from your first moving average as observations.

6-Step Procedure for Using Moving Averages. When using moving averages, you should use the following 6-step procedure in your analysis:

**Step 1.** Collect the time services data.
**Step 2.** Determine which moving average model to use.
- No time-series trend -- use a single moving average.
- Time-series trend -- use a double moving average.

**Step 3.** Develop 1-period forecasts using different averaging periods to compare with actual observations to evaluate accuracy.

**Step 4.** Evaluate 1-period forecast accuracy using mean absolute deviations (MADs) between forecasts and actual observations.

**Step 5.** Select the averaging period found to produce the most accurate results.

**Step 6.** Use the moving average in forecasting.
6.1 - Identifying Situations For Use

Situations for Use. You can use moving averages in any situation where you are attempting to forecast a variable and you cannot identify or you cannot measure an independent variable except time that appears to be related to changes in the variable. In contract pricing, moving averages are often used to:

- **Develop estimating rates and factors.** For example, most production operations involve substantial amounts of material. When material is used, there is normally some amount of scrap that can no longer be used for its intended purpose. This can include:
  o Waste from production operations (e.g., sheet metal left over after shapes have been cut from it).
  o Spoilage (e.g., material that has exceeded its useful shelf life, losses in storage, defective parts, etc.).
  o Defective parts (e.g., parts that fail inspection during the production process).
  o Material scrap rates are affected by a variety of factors including production methods, product design, and materials. Because the specific effect of these variables is difficult to identify and measure, scrap rates are commonly estimated using moving averages.

Rates may be calculated in either dollars or units of material and are commonly calculated in one of the following ways:

\[
\begin{align*}
\text{Scrap Dollars} & \quad \text{or} \quad \frac{\text{Scrap Dollars}}{\text{Total Assembly Material Dollars}} \\
\text{Scrap Units} & \quad \text{or} \quad \frac{\text{Scrap Units}}{\text{Total Assembly Material Units}}
\end{align*}
\]

In calculating such estimating factors, you should track the cost element being estimated (scrap) and the factor base separately over the averaging period. Then you can calculate the moving average rate by completing the rate calculation. However, if that is not possible, you can calculate the moving average using the scrap rates from each data period. The major disadvantage of the latter method is that periods of high and low production receive the same weight in analysis.

- **Estimate contractor sales volume.** A variety of factors affect sales volume (e.g., company products, the economy, Government spending, and many others). Estimates should include current contracts, known future contracts, other known sales, and currently unknown sales. One way of estimating currently unknown sales is with a moving average based on recent sales experience.

- **Estimate contract requirements.** Many contracts obligate the contractor to meet uncertain requirements. A requirements contract for a particular product may require the contractor to meet all Government demand during the contract period. A maintenance contract may require the contractor to respond to unscheduled service calls. In these and similar situations, a moving average can provide estimates of future requirements based on the recent past.

- **Estimate economic change.** A moving average can be used to estimate future economic change based on recent history. For example, wage rates and product price changes (index numbers) can be estimated using moving averages.

6.2 - Determining Which Moving Average Model To Use

General Criteria for Model Selection. There are several moving average models that can be used in contract pricing. The two most commonly used are the single moving average and the double moving average. Your decision on which model to use will depend on whether the data indicate a trend (upward or downward) in the values of the dependent variable. If there is:

- **No time-series data trend** - use a single moving average.
- **Time-series data trend** - use a double moving average.

Methods to Determine If Data Indicate Dependent Variable Trend. There are three common methods you could use to determine whether or not there is trend in a data set: graphic analysis, regression analysis,
and Spearman's rank correlation coefficient.

- **Graphic Analysis.** Graphic analysis entails plotting the data (either manually or by computer) and determining by visual inspection whether or not there is trend in the data. The problem with this technique is that it is not consistently accurate. It is particularly difficult to make a decision when there may or may not be a slight trend.

- **Regression Analysis.** Regression analysis entails the calculation of a least-squares-best-fit (LSBF) estimating equation using time as the independent variable and testing the significance of the slope using the T-test. Though this is an accurate technique, it is rather tedious even when done using a computer.

- **Spearman’s Rank Correlation Coefficient.** Spearman's rank correlation coefficient, also known as the Rank Spearman (RANSP) test involves calculation of an RS value and comparing that value with a critical value obtained from a table. This is the test that is most commonly used, because it is accurate and relatively easy to calculate even when done manually. However, before using the RANSP test, assure that the following three conditions have been met:
  - You must have data from at least four observations.
  - You must not have reason to suspect a cyclical or seasonal effect.
  - You must not have reason to suspect that there is a change in trend direction (monotonic trend).

*Calculating the RANSP.* A model to compute the RANSP is provided at RANSP Test Example 1. Assume that you have collected historical quarterly wage data and you want to determine if there is trend in the data.

Assume you have the following data in table format in the order in which the values occurred and number the time periods.

<table>
<thead>
<tr>
<th>Quarter (t)</th>
<th>Wage Rate (Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.50</td>
</tr>
<tr>
<td>2</td>
<td>$11.80</td>
</tr>
<tr>
<td>3</td>
<td>$12.85</td>
</tr>
<tr>
<td>4</td>
<td>$13.95</td>
</tr>
<tr>
<td>5</td>
<td>$13.30</td>
</tr>
<tr>
<td>6</td>
<td>$13.95</td>
</tr>
<tr>
<td>7</td>
<td>$15.00</td>
</tr>
<tr>
<td>8</td>
<td>$16.20</td>
</tr>
<tr>
<td>9</td>
<td>$16.10</td>
</tr>
</tbody>
</table>

Using the model at ***, we compute an RS of .9375), which is greater than RS_{crit} of .4667. Thus, we can assume there is a trend in the data. Therefore, you should use a double moving average.

*RANSP Test Example 2.* Again, assume that you have collected historical quarterly wage data and you want to determine if there is trend in the data.

Assume you have the following data in table format in the order in which the values occurred and number the time periods.

<table>
<thead>
<tr>
<th>Quarter (t)</th>
<th>Wage Rate (Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.70</td>
</tr>
</tbody>
</table>
2 $12.60  
3 $12.00  
4 $13.00  
5 $12.10  
6 $12.50  
7 $12.80  
8 $13.00  
9 $12.85  

In this example, the model computes an RS of .4375, which is less than RS_{crit} of .4667. Thus, we would assume that there is no trend in the data. Therefore, you would use a single moving average.

### 6.3 - Evaluating And Using Single Moving Averages

**Procedures for Selecting a Single Moving Average for Forecasting.** The single moving average is designed to smooth random variation in the estimate. The more data periods you use to calculate a single moving average, the greater the smoothing affect. For example, a 12-period moving average will average out most random variation, because each observation is only one-twelfth of the average. However, a 12-period moving average will be slow to react to a true change in the variable that you are attempting to estimate. On the other hand, a three period moving average will react much faster, because one data point is one-third of the calculation instead of one-twelfth.

No averaging period is best for forecasting in all circumstances. You must identify the best averaging period for each situation:

**Step 1. Develop 1-period forecasts using different available periods so that you can compare forecasts with actual observations to evaluate accuracy.**
- Use at least three periods of data in developing a moving average. You can calculate 3-period moving averages beginning in Period 3. You can calculate 4-period moving averages beginning in Period 4. For any value of n, you can calculate an n-period single moving average beginning in Period n.
- To conduct a meaningful evaluation of forecast accuracy, you must have at least two forecasts and actual data from the same periods for accuracy evaluation. As a result, the largest number of periods (n) that you can use for developing single moving averages is two less than the total number of observations.

**Step 2. Evaluate 1-period forecast accuracy using mean absolute deviations (MADs) between forecasts and actual observations.**

**Step 3. Select the averaging period found to produce the most accurate results.**

**Calculations Required for Forecast Development.** Develop 1-period forecasts using different available periods so that you can compare forecasts with actual observations to evaluate accuracy.

### Step 1A. Calculate Single Moving Averages.

Calculate single moving averages for available averaging periods using the following equation:

$$M_{1n} = \frac{Y_{nt} + Y_{t+1} + \ldots + Y_{tn+1}}{n}$$

Where:
- $M_{1n}$ = A single n-period moving average calculated in Period t
- $Y_t$ = An observation in Period t of the variable being forecast
- n = The number of time periods in the moving average

**Step 1B. Develop Forecasts Using Moving Averages.** Once you calculate a moving average, you can use that average for forecasting.
Where:
\[ F_{M1_{n,t+h}} = M_{1_{nt}} \]

Where:
- \( F_{M1_{n,t+h}} \) = A single, n-period, moving average forecast made in Period t for Period t+h
- \( n \) = The number of periods in the moving average
- \( t \) = The period in which the forecast is made
- \( h \) = The horizon, the number of periods you are forecasting into the future

Developing 1-Period Forecasts for Example 2 Data.

**Step 1A. Calculate Single Moving Averages.** In the previous section, we determined that we should use a single moving average to forecast future wage rates from the data below. Here we will use the data to demonstrate the procedures for single moving average forecast development.

<table>
<thead>
<tr>
<th>Quarter (t)</th>
<th>Wage Rate (Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.70</td>
</tr>
<tr>
<td>2</td>
<td>$12.60</td>
</tr>
<tr>
<td>3</td>
<td>$12.00</td>
</tr>
<tr>
<td>4</td>
<td>$13.00</td>
</tr>
<tr>
<td>5</td>
<td>$12.10</td>
</tr>
<tr>
<td>6</td>
<td>$12.50</td>
</tr>
<tr>
<td>7</td>
<td>$12.80</td>
</tr>
<tr>
<td>8</td>
<td>$13.00</td>
</tr>
<tr>
<td>9</td>
<td>$12.85</td>
</tr>
</tbody>
</table>

Note that we have observations from nine periods. That means that we can calculate 3-period, 4-period, 5-period, 6-period, and 7-period moving averages. With nine observations, we cannot evaluate forecasts based on a single moving average of more than seven (9 - 2) periods.

<table>
<thead>
<tr>
<th>Quarter (t)</th>
<th>Actual (Y)</th>
<th>( \bar{3Y} )</th>
<th>( M1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$12.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$12.00</td>
<td>$37.30</td>
<td>$12.43</td>
</tr>
<tr>
<td>4</td>
<td>$13.00</td>
<td>$37.60</td>
<td>$12.53</td>
</tr>
<tr>
<td>5</td>
<td>$12.10</td>
<td>$37.10</td>
<td>$12.37</td>
</tr>
<tr>
<td>6</td>
<td>$12.50</td>
<td>$37.60</td>
<td>$12.53</td>
</tr>
<tr>
<td>7</td>
<td>$12.80</td>
<td>$37.40</td>
<td>$12.47</td>
</tr>
</tbody>
</table>
Complete terminology for these moving averages is M13,t. To save space the term has been simplified to M1.

**Step 1B. Develop Forecasts Using Moving Averages:** Once we calculate a single moving average, we can use that average to develop a forecast. To evaluate the accuracy of each moving average, we forecast one period into the future so that we can compare the forecast with the actual Y value. For example, the moving average from Period 3, becomes the Forecast for Period 4.

<table>
<thead>
<tr>
<th>Quarter (t)</th>
<th>Actual (Y)</th>
<th>( \bar{Y}^{3Y} )</th>
<th>M1</th>
<th>FM1**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$12.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$12.00</td>
<td>$37.30</td>
<td>$12.43</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>$13.00</td>
<td>$37.60</td>
<td>$12.53</td>
<td>$12.43</td>
</tr>
<tr>
<td>5</td>
<td>$12.10</td>
<td>$37.10</td>
<td>$12.37</td>
<td>$12.53</td>
</tr>
<tr>
<td>6</td>
<td>$12.50</td>
<td>$37.60</td>
<td>$12.53</td>
<td>$12.37</td>
</tr>
<tr>
<td>7</td>
<td>$12.80</td>
<td>$37.40</td>
<td>$12.47</td>
<td>$12.53</td>
</tr>
<tr>
<td>8</td>
<td>$13.00</td>
<td>$38.30</td>
<td>$12.77</td>
<td>$12.47</td>
</tr>
<tr>
<td>9</td>
<td>$12.85</td>
<td>$38.65</td>
<td>$12.88</td>
<td>$12.77</td>
</tr>
</tbody>
</table>

**Complete terminology for the forecasts in this column is FM13,t,t+1. To save space the term has been simplified to FM1.**

We would develop the 4-period, 5-period, 6-period, and 7-period single moving average forecasts using the same procedure.

<table>
<thead>
<tr>
<th>Quarter (t)</th>
<th>Actual (Y)</th>
<th>( \bar{Y}^{4Y} )</th>
<th>M1</th>
<th>FM1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$12.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$12.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>$13.00</td>
<td>$50.30</td>
<td>$12.58</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$12.10</td>
<td>$49.70</td>
<td>$12.43</td>
<td>$12.58</td>
</tr>
<tr>
<td>6</td>
<td>$12.50</td>
<td>$49.60</td>
<td>$12.40</td>
<td>$12.43</td>
</tr>
<tr>
<td>7</td>
<td>$12.80</td>
<td>$50.40</td>
<td>$12.60</td>
<td>$12.40</td>
</tr>
<tr>
<td>Quarter (t)</td>
<td>Actual (Y)</td>
<td>$\hat{Y}$</td>
<td>M1</td>
<td>FM1</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>-----------</td>
<td>----</td>
<td>-----</td>
</tr>
<tr>
<td>1</td>
<td>$12.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$12.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$12.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>$13.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$12.10</td>
<td>$62.40</td>
<td>$12.48</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$12.50</td>
<td>$62.20</td>
<td>$12.48</td>
<td>$12.48</td>
</tr>
<tr>
<td>7</td>
<td>$12.80</td>
<td>$62.40</td>
<td>$12.48</td>
<td>$12.48</td>
</tr>
<tr>
<td>8</td>
<td>$13.00</td>
<td>$63.40</td>
<td>$12.68</td>
<td>$12.48</td>
</tr>
<tr>
<td>9</td>
<td>$12.85</td>
<td>$63.25</td>
<td>$12.65</td>
<td>$12.68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quarter (t)</th>
<th>Actual (Y)</th>
<th>$\Sigma^6Y$</th>
<th>M1</th>
<th>FM1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$12.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$12.00</td>
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<td></td>
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</tr>
<tr>
<td>4</td>
<td>$13.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$12.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$12.50</td>
<td>$74.90</td>
<td>$12.48</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>$12.80</td>
<td>$75.00</td>
<td>$12.50</td>
<td>$12.48</td>
</tr>
<tr>
<td>8</td>
<td>$13.00</td>
<td>$75.40</td>
<td>$12.57</td>
<td>$12.50</td>
</tr>
<tr>
<td>9</td>
<td>$12.85</td>
<td>$76.25</td>
<td>$12.71</td>
<td>$12.57</td>
</tr>
</tbody>
</table>

7-Period Single Moving Average Forecast
### Quarter (t) | Actual (Y) | ΣY | M1 | F1
---|---|---|---|---
1 | $12.70 | | | |
2 | $12.60 | | | |
3 | $12.00 | | | |
4 | $13.00 | | | |
5 | $12.10 | | | |
6 | $12.50 | | | |
7 | $12.80 | $87.70 | $12.53 | |
8 | $13.00 | $88.00 | $12.57 | $12.53 |
9 | $12.85 | $88.25 | $12.61 | $12.57 |

**Calculations Required for Evaluating Forecast Accuracy.** Evaluate 1-period forecast accuracy using mean absolute deviations (MADs) between forecasts and actual observations.

You can use several different statistics to measure the accuracy of a moving average forecast: the range of the error terms, the standard error of the forecast, or the mean absolute deviation of the forecast (MADf). Of these three options, the statistic which best combines the qualities of ease of computation and utility is the MADf. As a result, it is the statistic most commonly used to evaluate moving average accuracy.

You can use several different statistics to measure the accuracy of a moving average forecast: the range of the error terms, the standard error of the forecast, or the mean absolute deviation of the forecast (MADf). Of these three options, the statistic which best combines the qualities of ease of computation and utility is the MADf. As a result, it is the statistic most commonly used to evaluate moving average accuracy.

The MADf tells us on average how much, in absolute terms, actual values deviated from the forecasted value.

\[
\text{MAD}_f = \frac{\Sigma |D|}{n}
\]

Where:
- \(\text{MAD}_f\) = The mean absolute deviation of the forecast
- \(S\) = Summation of all the variables that follow the symbol
- \(|D|\) = The absolute value of the deviation (i.e., the difference, without regard to sign) between the actual value which occurred and the value forecasted
- \(|D| = |Y - F|\)
- \(n\) = The number of deviations (Ds) computed

**Evaluate forecast accuracy of single moving averages calculated using the data in Example 2.**

### 3-Period Single Moving Average Evaluation

| t | Actual (Y) | M1 | FM1 | D | |D|
---|---|---|---|---|---|---
1 | 12.70 | | | | | |
2 | 12.60 | | | | | |
3 | 12.00 | | | 12.43 | | |
### 4-Period Single Moving Average Evaluation

| t | Actual (Y) | M1 | FM1 | D   | |D| |
|---|-------------|----|-----|-----|---|
| 1 | 12.70       |    |     |     |   |
| 2 | 12.60       |    |     |     |   |
| 3 | 12.00       |    |     |     |   |
| 4 | 13.00       | 12.58 |     |     |   |
| 5 | 12.10       | 12.43 | 12.58 | -0.48 | 0.48 |
| 6 | 12.50       | 12.40 | 12.43 | 0.07 | 0.07 |
| 7 | 12.80       | 12.60 | 12.40 | 0.40 | 0.40 |
| 8 | 13.00       | 12.60 | 12.60 | 0.40 | 0.40 |
| 9 | 12.85       | 12.79 | 12.60 | 0.25 | 0.25 |

Total Absolute Deviation = 1.60

Mean Absolute Deviation = \( \frac{\sum |D|}{n} = \frac{1.60}{5} = 0.32 \)

## 5-Period Single Moving Average Evaluation

| t | Actual (Y) | M1 | FM1 | D   | |D| |
|---|-------------|----|-----|-----|---|
| 1 | 12.70       |    |     |     |   |
| 2 | 12.60       |    |     |     |   |
| 3 | 12.00       |    |     |     |   |

Total Absolute Deviation = 2.01

Mean Absolute Deviation = \( \frac{\sum |D|}{n} = \frac{2.01}{6} = 0.34 \)
| T | Actual (Y) | M1 | FM1 | D | |D| |
|---|---|---|---|---|---|
| 1 | 12.70 |   |   |   |   |
| 2 | 12.60 |   |   |   |   |
| 3 | 12.00 |   |   |   |   |
| 4 | 13.00 |   |   |   |   |
| 5 | 12.10 |   |   |   |   |
| 6 | 12.50 | 12.48 |   | 0.02 | 0.02 |
| 7 | 12.80 | 12.48 | 12.48 | 0.36 | 0.36 |
| 8 | 13.00 | 12.68 | 12.48 | 0.52 | 0.52 |
| 9 | 12.85 | 12.65 | 12.68 | 0.17 | 0.17 |

**Total Absolute Deviation**: 1.07

Mean Absolute Deviation = \( \frac{\sum |D|}{n} = \frac{1.07}{4} = 0.27 \)

---

**6-Period Single Moving Average Evaluation**

| T | Actual (Y) | M1 | FM1 | D | |D| |
|---|---|---|---|---|---|
| 1 | 12.70 |   |   |   |   |
| 2 | 12.60 |   |   |   |   |
| 3 | 12.00 |   |   |   |   |
| 4 | 13.00 |   |   |   |   |
| 5 | 12.10 |   |   |   |   |
| 6 | 12.50 | 12.48 |   | 0.32 | 0.32 |
| 7 | 12.80 | 12.50 | 12.48 | 0.50 | 0.50 |
| 8 | 13.00 | 12.57 | 12.50 | 0.28 | 0.28 |
| 9 | 12.85 | 12.71 | 12.57 |   |   |

**Total Absolute Deviation**: 1.10

Mean Absolute Deviation = \( \frac{\sum |D|}{n} = \frac{1.10}{3} = 0.37 \)

---

**7-Period Single Moving Average Evaluation**

| T | Actual (Y) | M1 | FM1 | D | |D| |
|---|---|---|---|---|---|
| 1 | 12.70 |   |   |   |   |
| 2 | 12.60 |   |   |   |   |
| 3 | 12.00 |   |   |   |   |
Selecting an Averaging Period. Select the averaging period found to produce the most accurate results.

Summary Of MAD Computations

<table>
<thead>
<tr>
<th>n</th>
<th>MAD_F</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.34</td>
</tr>
<tr>
<td>4</td>
<td>0.32</td>
</tr>
<tr>
<td>5</td>
<td>0.27</td>
</tr>
<tr>
<td>6</td>
<td>0.37</td>
</tr>
<tr>
<td>7</td>
<td>0.38</td>
</tr>
</tbody>
</table>

The lowest MAD_F in this example was attained using a 5-period single moving average. Accordingly, you should select a 5-period single moving average for forecasting.

Use the Single Moving Average in Forecasting. Use the moving average with the lowest MAD_F for forecasting. Based on an evaluation of the data in Example 2, you should use the most recent 5-period single moving average to forecast for any future period. For example, the forecast for Period 13 would be $12.65.

The selection of the most accurate averaging period for forecast development is essential. Different averaging periods can produce substantially different forecasts. For example, using different averaging periods and the data in this example, you could have calculated a wide range of forecasts for Period 13.

Period 13 Forecast Comparison

<table>
<thead>
<tr>
<th>n</th>
<th>FM1_{n,9,13}</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>$12.88</td>
</tr>
<tr>
<td>4</td>
<td>$12.79</td>
</tr>
<tr>
<td>5</td>
<td>$12.65</td>
</tr>
<tr>
<td>6</td>
<td>$12.71</td>
</tr>
<tr>
<td>7</td>
<td>$12.61</td>
</tr>
</tbody>
</table>

Of these possibilities, the 5-period single moving average forecast, $12.65, appears to be the most reasonable.
6.4 - Evaluating And Using Double Moving Averages

Procedures for Selecting a Double Moving Average for Forecasting. The double moving average is designed to develop a forecast that smoothes random variation and projects any trend exhibited in the data. As with the single moving average, no averaging period is best for forecasting in all circumstances. You must identify the best averaging period for each situation:

**Step 1.** Develop 1-period forecasts using different available periods so that you can compare forecasts with actual observations to evaluate accuracy.

- Normally, we use at least a three period double moving average. Since a double moving average is a moving average of moving averages, you cannot begin to calculate a 3-period double moving average until Period 5. You can calculate 4-period double moving averages beginning in Period 7. For any value of n, you can calculate an n-period double moving average beginning in Period 2n - 1.
- To conduct a meaningful evaluation of forecast accuracy, you must have at least two forecasts and actual data for the same period for accuracy evaluation. As a result, you must have 2n + 1 data points in order to calculate a double moving average forecast and the related MADF.

**Step 2.** Evaluate 1-period forecast accuracy using mean absolute deviations (MADs) between forecasts and actual observations.

**Step 3.** Select the averaging period found to produce the most accurate results.

Calculations Required for Forecast Development. Develop 1-period forecasts using available averaging periods so that you can compare forecasts with actual observations to evaluate accuracy.

**Step 1A. Calculate Double Moving Averages.** Calculate double moving averages for available averaging periods using the following equation:

\[
M2_{n,t} = \frac{M1_{n,t} + M1_{n,t-1} + \ldots + M1_{n,t-n+1}}{n}
\]

Where:
- \(M2_{n,t}\) = An n-period double moving average calculated in Period t
- \(M1_{n,t}\) = An n-period single moving average calculated in period t
- \(n\) = Number of periods in the moving average

**Note:** You must use the same value of \(n\) for calculating both \(M1\) and \(M2\).

**Step 1B. Develop Forecasts Using Moving Averages:** Once you calculate a double moving average, you can use that average to develop a forecast.

\[
FM2_{n,t,t+h} = A_{n,t} + B_{n,t} + h
\]

Where:
- \(FM2_{n,t,t+h}\) = The n-period, double moving average forecast made in period t for period t+h
- \(A_{n,t}\) = The intercept for an n-period double moving average forecast, calculated:
  \[
  A_{n,t} = 2M1_{n,t} - M2_{n,t}
  \]
- \(B_{n,t}\) = The slope for an n-period double moving average forecast, calculated:
  \[
  B_{n,t} = \frac{2}{n - 1} (M1_{n,t} - M2_{n,t})
  \]
- \(n\) = The number of periods in the moving average
- \(t\) = The period in which the forecast is made
- \(h\) = The horizon, the number of periods you are forecasting into the future

**Note:** Depending on the value of \(n\) and the period in which the forecast is made, there is a unique intercept \((A_{n,t})\) and slope \((B_{n,t})\).

**Developing 1-Period Forecasts for Example 1 Data.**

**Step 1A. Calculate Double Moving Averages.** In the previous section, we determined that we should use a double moving average to develop a forecast from the data below. Here we will use the data to demonstrate the procedures for double moving average forecast development.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Wage Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Step 1B. Develop Forecasts Using Moving Averages

Period 5 is the first period that we can develop a 3-period double moving average forecast, because that is the first period that we have the values of $M_1$ and $M_2$ that we need to make the forecast. In Period 5, we can make a forecast for Period 6 as follows:

- **$A_{3.5} = 2M_{1.3.5} - M_{2.3.5}$**
- **$B_{3.5} = (2 \div (3-1)) (M_{1.3.5} - M_{2.3.5})$**
- **$FM_{2.3.5.6} = A_{3.5} + B_{3.5}(h)$**

<table>
<thead>
<tr>
<th>$t$</th>
<th>$Y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12.50$</td>
</tr>
<tr>
<td>2</td>
<td>$11.80$</td>
</tr>
<tr>
<td>3</td>
<td>$12.85$</td>
</tr>
<tr>
<td>4</td>
<td>$13.95$</td>
</tr>
<tr>
<td>5</td>
<td>$13.30$</td>
</tr>
<tr>
<td>6</td>
<td>$13.95$</td>
</tr>
<tr>
<td>7</td>
<td>$15.00$</td>
</tr>
<tr>
<td>8</td>
<td>$16.20$</td>
</tr>
<tr>
<td>9</td>
<td>$16.10$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$Y$</th>
<th>$M_1$</th>
<th>$M_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$37.15$</td>
<td>$12.38$</td>
<td></td>
</tr>
<tr>
<td>$38.60$</td>
<td>$12.87$</td>
<td></td>
</tr>
<tr>
<td>$40.10$</td>
<td>$13.37$</td>
<td>$38.62$</td>
</tr>
<tr>
<td>$41.20$</td>
<td>$13.73$</td>
<td>$39.97$</td>
</tr>
<tr>
<td>$42.25$</td>
<td>$14.08$</td>
<td>$41.18$</td>
</tr>
<tr>
<td>$45.15$</td>
<td>$15.05$</td>
<td>$42.86$</td>
</tr>
<tr>
<td>$47.30$</td>
<td>$15.77$</td>
<td>$44.90$</td>
</tr>
</tbody>
</table>

3-Period Double Moving Average Forecast
Forecasts developed using a 4-period moving average and the same procedures are shown in the following table. Note that only two forecasts can be made for comparison with actual observations.

### 4-Period Double Moving Average Forecast

<table>
<thead>
<tr>
<th>t</th>
<th>Actual</th>
<th>M1</th>
<th>M2</th>
<th>A</th>
<th>B</th>
<th>FM2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>11.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>12.85</td>
<td>12.3</td>
<td>8</td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>13.95</td>
<td>12.8</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>13.30</td>
<td>13.3</td>
<td>7</td>
<td>12.8</td>
<td>7</td>
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</tr>
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<td></td>
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<td></td>
<td></td>
<td>13.8</td>
<td>7</td>
<td>0.50</td>
</tr>
<tr>
<td>6</td>
<td>13.95</td>
<td>13.7</td>
<td>3</td>
<td>13.3</td>
<td>7</td>
<td>0.41</td>
</tr>
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<td></td>
<td></td>
<td>14.1</td>
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<tr>
<td>7</td>
<td>15.00</td>
<td>14.0</td>
<td>8</td>
<td>13.7</td>
<td>3</td>
<td>0.35</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>14.4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>16.20</td>
<td>15.0</td>
<td>5</td>
<td>14.2</td>
<td>9</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>16.10</td>
<td>15.7</td>
<td>7</td>
<td>14.9</td>
<td>7</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Calculations Required for Evaluating Forecast Accuracy. Evaluate 1-period forecast accuracy using mean absolute deviations (MADs) between forecasts and actual observations. Here we use the same formula for calculating MADr that we used in evaluating the accuracy of single moving averages.

\[ \text{MAD}_r = \frac{\sum |D|}{n} \]

Where:
- \( \text{MAD}_r \) = The mean absolute deviation of the forecast
- \( S \) = Summation of all the variables that follow the symbol
- \( |D| \) = The absolute value of the deviation (i.e., the difference, without regard to sign) between the actual value which occurred and the value forecasted
- \( |D| = |Y - F| \)
- \( n \) = The number of deviations (Ds) computed

### 3-Period Double Moving Average Forecast Evaluation

| t | Actual | M1 | M2 | A | B | FM2 | D | |D| |
|---|---|---|---|---|---|---|---|---|
| 1 | 12.50 | | | | | | | |
| 2 | 11.80 | | | | | | | |
| 3 | 12.85 | 12.38 | | | | | | |
| 4 | 13.95 | 12.37 | | | | | | |
| 5 | 13.30 | 13.77 | 12.87 | 13.87 | 0.50 | | | |
| 6 | 13.95 | 13.73 | 13.32 | 14.14 | 0.41 | 14.37 | -0.42 | 0.42 |
| 7 | 15.00 | 14.08 | 13.73 | 14.43 | 0.35 | 14.55 | 0.45 | 0.45 |
| 8 | 16.20 | 15.05 | 14.29 | 15.81 | 0.76 | 14.78 | 1.42 | 1.42 |
| 9 | 16.10 | 15.77 | 14.97 | 16.57 | 0.80 | 16.57 | -0.47 | 0.47 |

**Total Absolute Deviation** 2.76

**Mean Absolute Deviation** = \( \hat{\frac{\sum |D|}{n}} = 2.76 ÷ 4 = 0.69 \)

### 4-Period Double Moving Average Forecast Evaluation

| Actual | M1 | M2 | t | B | FM2 | D | |D| |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
Select the averaging period found to produce the most accurate results.

**Summary Of MAD Computations**

<table>
<thead>
<tr>
<th>n</th>
<th>MAD&lt;sub&gt;F&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.69</td>
</tr>
<tr>
<td>4</td>
<td>0.54</td>
</tr>
</tbody>
</table>

The lowest MAD<sub>F</sub> in this example was attained using a 4-period double moving average. Accordingly, you should select a 4-period double moving average for forecasting.

Use a Double Moving Average in Forecasting. Use the moving average with the lowest MAD<sub>F</sub> for forecasting. Based on our evaluation of the data in Example 1, we would use the 4-period double moving average for forecasting. For example our forecast for Period 13 [four periods (h) into the future] would be $18.77, calculated as follows:

\[ A_{3,5} = 2M_{4,9} - M_{2,4,9} \]
\[ = 2(15.31) - 14.37 \]
\[ = 30.62 - 14.37 \]
\[ = 16.25 \]

\[ B_{3,5} = (2 ÷ (4-1)) \left( M_{4,9} - M_{2,4,9} \right) \]
\[ = (2 ÷ (4-1)) (15.31 - 14.37) \]
\[ = (2 ÷ 3) (15.31 - 14.37) \]
\[ = (2 ÷ 3) (0.94) \]
\[ = 0.63 \]

\[ FM_{2,3,5,6} = A_{4,9} + B_{4,9} (h) \]
\[ = 16.25 + 0.63 (4) \]
\[ = 16.25 + 2.52 \]
The selection of the most accurate averaging period for forecast development is essential. For example, using different averaging periods and the data in this example, we could have calculated two very different forecasts.

<table>
<thead>
<tr>
<th>Forecast Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

### 6.5 - Identifying Issues And Concerns

**Questions to Consider in Analysis.** As you perform price or cost analysis, consider the issues and concerns identified in this section, whenever you use moving averages.

- **Is a moving average the best choice for estimate development?**
  When using a moving average, you assume that the trend experienced over time is the best guide available to forecast future variable values. If that assumption is not correct, you should use another technique. Detailed estimates that consider all the facts involved are normally more defensible in negotiations than the result of any estimating relationship. If an independent variable (other than time) can be identified and measured, another comparison technique may provide better results than moving average analysis. For example, estimating parts demand based on sales and usage data would probably produce better results than an estimate based on use of a moving average. A moving average can estimate price changes based on recent periods but it cannot predict a turning point that will alter the historical pattern.

- **Is the type of moving average selected appropriate for the situation?**
  When there is a trend in the data, you should use a double moving average. When there is no trend, you should use a single moving average. If you use a single moving average in a situation where a trend exists, your forecast will not consider the trend.

- **Is the averaging period the best choice for the data?**
  You should select the averaging period that provides the best estimates when tested against actual observations. Take special care in your analysis when the moving average covers a large number or periods (e.g., 12 months). Selection of an average that covers a large number of periods is often appropriate because it dampens the effect of random fluctuation. However, an average that considers a large number of data points will also make it more difficult to identify a trend in the data. Occasionally, an estimator will use a large number of periods to mask a trend in the data. When analyzing estimates made using a moving average, you should look at the raw data and consider appropriate alternative estimating procedures.

- **How far into the future can you forecast?**
  The farther into the future that you forecast, the greater the risk. Remember, that you cannot predict a change in an historical trend with a moving average.

In this chapter, you will learn improvement curve concepts and their application to cost and price analysis.

- 7.0 - Chapter Introduction
- 7.1 - Situations for Use
- 7.2 - Analyzing Improvement Using Unit Data and Unit Theory
- 7.3 - Analyzing Improvement Using Lot Data and Unit Theory
- 7.4 - Fitting a Unit Curve
- 7.5 - Estimating Using Unit Improvement Curve Tables
- 7.6 - Identifying Issues and Concerns


7.0 Chapter Introduction
7.0.1 Basic Improvement Curve Concept
You may have learned about improvement curves using the name learning curve analysis. Today, many experts feel that the term learning curve implies too much emphasis on learning by first-line workers. They point out that the theory is based on improvement by the entire organization not just first-line workers. Alternative names proposed for the theory include: improvement curve, cost-quantity curve, experience curve, and others. None have been universally accepted. In this text, we will use the term improvement curve to emphasize the need for efforts by the entire organization to make improvements to reduce costs.

Just as there are many names for the improvement curve, there are many different formulations. However, in each case the general concept is that the resources (labor and/or material) required to produce each additional unit declines as the total number of units produced over the item's entire production history increases. The concept further holds that decline in unit cost can be predicted mathematically. As a result, improvement curves can be used to estimate contract price, direct labor-hours, direct material cost, or any other recurring contract cost.

7.0.2 Improvement Curve History
The improvement curve is based on the concept that, as a task is performed repetitively, the time required to perform the task will decrease. Management planners have followed that element of the concept for centuries, but T. P. Wright pioneered the idea that improvement could be estimated mathematically. In February 1936, Wright published his theory in the *Journal of Aeronautical Sciences* as part of an article entitled "Factors Affecting the Cost of Airplanes." Wright's findings showed that, as the number of aircraft produced in sequence increased, the direct labor input per airplane decreased in a regular pattern that could be estimated mathematically.

During the mobilization for World War II, both aircraft companies and the Government became interested in the theory. Among other considerations, the theory implied that a fixed amount of labor and equipment could be expected to produce larger and larger quantities of defense products as production continued. After World War II, the Government engaged the Stanford Research Institute (SRI) to study the validity of the improvement curve concept. The study analyzed essentially all World War II airframe direct labor input data to determine whether there was sufficient evidence to establish a standard estimating model. The SRI study validated a mathematical model based on the World War II findings that could be used as a tool for price analysis. However, that model was slightly different than the one originally offered by Wright.

Since World War II, the improvement curve concept has been used by Government and industry to aid in pricing contracts. Over the years, the improvement curve has been used as a contract estimating and analysis tool in a variety of industries including: airframes, electronics systems, machine tools, shipbuilding, missile systems, and depot level maintenance of equipment. Improvement curves have also been applied to service and construction contracts where tasks are performed repetitively.

7.0.3 Identifying Basic Improvement Curve Theories: Unit Improvement Curve
Since 1936, many different formulations have been proposed to explain and estimate the improvement that takes place in repetitive production efforts. Of these, the two most popular are the unit improvement curve and the cumulative average improvement curve. **Unit Improvement Curve.** The unit improvement curve is the model validated by the post-World War II SRI study. The formulation is also known by two other names: Crawford curve, after one of the leaders of the SRI research; and Boeing curve, after one of the firms that first embraced its use.

Unit curve theory can be stated as follows:
As the total volume of units produced doubles the cost per unit decreases by some constant percentage.

The constant percentage by which the costs of doubled quantities decrease is called the rate of learning. The term "slope" in the improvement curve analysis is the difference between 100 percent and the rate of improvement. If the rate of improvement is 20 percent, the improvement curve slope is 80 percent (100
percent - 20 percent). The calculation of slope is described in detail later in the chapter. Unit curve theory is expressed in the following equation:

\[ Y = AX^B \]

Where:

- \( Y \) = Unit cost (hours or dollars) of the \( X^{th} \) unit
- \( X \) = Unit number
- \( A \) = Theoretical cost (hours or dollars) of the first unit
- \( B \) = Constant that is related to the slope and the rate of change of the improvement curve. It is calculated from the relationship:

\[ B = \frac{\log \text{of the Slope}}{\log \text{of 2}} \]

In calculating \( B \), the slope MUST be expressed in decimal form rather than percentage form. Then \( B \) will be a negative #, leading to the decreasing property stated above.

### 7.0.4 Identifying Basic Improvement Curve Theories: Cumulative Average Improvement Curve

**Cumulative Average Improvement Curve.** The cumulative average improvement curve is the model first introduced by Wright in 1936. Like the unit improvement curve, the cumulative average curve is also known by two other names: Wright Curve, after T.P. Wright; and Northrop Curve, after one of the firms that first embraced its use.

Cumulative average theory can be stated as follows:

**As the total volume of units produced doubles the average cost per unit decreases by some constant percentage.**

As with the unit improvement curve, the constant percentage by which the costs of doubled quantities decrease is called the rate of improvement. The slope of the improvement curve analysis is the difference between 100 percent and the rate of learning. However, the rate of improvement and the slope are measured using cumulative averages rather than the unit values used in unit improvement curve analysis. Cumulative average curve theory is expressed in the following equation:

\[ Y = AX^B \]

Where:

- \( Y \) = Cumulative average unit cost (hours or dollars) of units through the \( X^{th} \) unit
- All other symbols have the same meaning used in describing the unit improvement curve.

**Curve Differences.** Note that the only difference between definitions of the unit improvement curve and the cumulative average improvement curve theories is the word *average*. In the unit curve, unit cost is reduced by the same constant percentage. In the cumulative average curve, the cumulative average cost is reduced by the same constant percentage. The most significant practical difference between the two different formulations is found in the first few units of production. Over the first few units, an operation following the cumulative average curve will experience a much greater reduction in cost (hours or dollars) than an operation following a unit curve with the same slope. In later production, the reduction in cost for an operation following a cumulative average curve will be about the same as an operation following a unit curve with the same slope. Because of the difference in early production, many feel that the unit curve should be used in situations where the firm is fully prepared for production; and the cumulative average curve should be used in situations where the firm is not completely ready for production. For example, the cumulative average curve should be used in situations where significant tooling or design problems may NOT be completely resolved. In such situations, the production of the first units will be particularly inefficient but improvement should be rapid as problems are resolved.

In practice, firms typically use one formulation regardless of differences in the production situation. Most firms in the airframe industry use the cumulative average curve. Most firms in other industries use the unit
7.1 Identifying Situations for Use

The improvement curve cannot be used as an estimating tool in every situation. Situations that provide an opportunity for improvement or reduction in production hours are the types of situations that lend themselves to improvement curve application. Use of the improvement curve should be considered in situations where there is:

- **A high proportion of manual labor.**
  It is more difficult to reduce the labor input when there is limited labor effort, the labor effort is machine paced, or individual line workers only touch the product for a few seconds.

- **Uninterrupted production.**
  As more and more units are produced the firm becomes more adept at production and the labor hour requirements are reduced. If supervisors, workers, tooling, or other elements of production are lost during a break in production, some improvement will also likely be lost.

- **Production of complex items.**
  The more complex the item the more opportunity there is to improve.

- **No major technological change.**
  The theory is based on continuing minor changes in production and in the item itself. However, if there are major changes in technology, the benefit of previous improvement may be lost.

- **Continuous pressure to improve.**
  The improvement curve does not just happen; it requires management effort. The management of the firm must exert continuous pressure to improve. This requires investment in the people and equipment needed to obtain improvement.

7.1.1 Situations for Use

As you examine situations that appear to have potential for improvement curve application, consider management emphasis on the following factors affecting the rate of improvement:

- **Job Familiarization By Workers.**
  As noted earlier, many feel that this element has been overemphasized over the years. Still, workers do improve from repetition and that improvement is an important part of the improvement curve.

- **Improved Production Procedures.**
  As production continues, both workers and production engineers must constantly be on the lookout for better production procedures.

- **Improved Tooling and Tool Coordination.**
  Part of the examination of production procedures must consider the tooling used for production. Tooling improvements offer substantial possibilities for reduction of labor requirements.

- **Improved Work Flow Organization.**
  Improving the flow of the work can substantially reduce the labor effort that does not add value to the product. Needless movement of work in progress can add significant amounts of labor effort.

- **Improved Product Producibility.**
  Management and workers must constantly consider product changes that will make the product easier to produce without degrading the quality of the final product.

- **Improved Engineering Support.**
  The faster production problems can be identified and solved, the less production labor effort will be lost waiting for problem resolution.

- **Improved Parts Support.**
  As production continues, better scheduling should be possible to eliminate or significantly reduce worker time lost waiting for supplies. In addition, production materials more appropriate for production can be identified and introduced to the production process.
7.1.2 Factors that Support Improvement

As you examine situations that appear to have potential for improvement curve application, consider management emphasis on the following factors affecting the rate of improvement:

- **Job Familiarization By Workers.** As noted earlier, many feel that this element has been overemphasized over the years. Still, workers do improve from repetition and that improvement is an important part of the improvement curve.
- **Improved Production Procedures.** As production continues, both workers and production engineers must constantly be on the lookout for better production procedures.
- **Improved Tooling and Tool Coordination.** Part of the examination of production procedures must consider the tooling used for production. Tooling improvements offer substantial possibilities for reduction of labor requirements.
- **Improved Work Flow Organization.** Improving the flow of the work can substantially reduce the labor effort that does not add value to the product. Needless movement of work in progress can add significant amounts of labor effort.
- **Improved Product Producibility.** Management and workers must constantly consider product changes that will make the product easier to produce without degrading the quality of the final product.
- **Improved Engineering Support.** The faster production problems can be identified and solved, the less production labor effort will be lost waiting for problem resolution.
- **Improved Parts Support.** As production continues, better scheduling should be possible to eliminate or significantly reduce worker time lost waiting for supplies. In addition, production materials more appropriate for production can be identified and introduced to the production process.

7.2 Analyzing Improvement Using Unit Data and the Unit Theory

Section Introduction

In this text, we will only consider application of the unit improvement curve in making initial contract estimates. There are many texts that address other improvement curve theories (e.g., cumulative average improvement curves), as well as many advanced issues such as the effects of contract changes, breaks in production, and retained learning.

Improvement Illustration

To illustrate the effect of the unit curve, assume that the first unit required 100,000 labor-hours to produce. If the slope of the curve is 80 percent slope, the following table demonstrates the labor-hours required to produce units at successively doubled quantities.

<table>
<thead>
<tr>
<th>Units Produced</th>
<th>LABOR-HOURS Per Unit at Doubled Quantities</th>
<th>Difference in LABOR-HOURS Per Unit at Doubled Quantities</th>
<th>Rate of Improvement (%)</th>
<th>Slope of Curve (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100,000</td>
<td></td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>80,000</td>
<td>20,000</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>64,000</td>
<td>16,000</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>8</td>
<td>51,200</td>
<td>12,800</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>16</td>
<td>40,960</td>
<td>10,240</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>32</td>
<td>32,768</td>
<td>8,192</td>
<td>20</td>
<td>80</td>
</tr>
</tbody>
</table>

Obviously, the amount of labor-hour reduction between doubled quantities is not constant. The number of
hours of reduction between doubled quantities is constantly declining. However, the rate of change or decline remains constant (20 percent). Also note that the number of units required to double the quantity produced is constantly increasing. Between Unit #1 and Unit #2, it takes only one unit to double the quantity produced. Between Unit #16 and Unit #32, 16 units are needed.

### 7.2.1 Analysis Techniques Graphing the Data

Improvement curves are modeled using an exponential equation. Exponential equations can be solved using logarithms. Plotting improvement curve data on a logarithmic scale causes the points to lie on a straight line, which allows for projection of future costs. Historically this process was accomplished manually; however, it can now be accomplished using the regression function on most data analysis tools or using computer modeling programs. Since it is often helpful to understand the theory behind the use of data analysis tools and computer models, this text will include information and illustrations on how to manually calculate the cost of future units as well as introduce the reader to the differences when calculating using the regression function.

**Rectangular Coordinate Graph.** A labor-hour graph of this data curve drawn on ordinary graph paper (rectangular coordinates) becomes a curve as shown in the graph below. In this graph equal spaces represent equal amounts of change. When thinking of numbers in terms of their absolute values, this graph presents an accurate picture, but it is difficult to make an accurate prediction from this curve.

The graph is a curve because the number of hours of reduction between doubled quantities is constantly declining and an increasing number of units are required to double the quantity produced. Note that most of the improvement takes place during the early units of production. The curve will eventually become almost flat. The number of production hours could become quite small but it will never reach zero.

**Log-Log Graph.** To examine the data and make predictions using unit improvement curve theory, we need to transform the data to logarithms. One way of making the transformation is through the use of log-log graph paper also known as full-logarithmic graph paper.
7.2.2 Log-Log Paper
There are several special elements that we must consider when using log-log graph paper.

● There is already a scale indicated on both the horizontal and vertical axes. Note that there are no zeros. Values can approach zero but never reach it.

● The scale only goes from "1" to "1". Each time the number scale goes from "1" to "1", the paper depicts a cycle. Each "1" moving up on the vertical axis or to the right on the horizontal axis is 10 times the "1" before it. You should mark the actual scale you are using in the margin of the log-log paper before starting to plot points.

● In improvement curve analysis, always graph the number of the unit produced on the horizontal axis. Assign the first "1" on the left of the page a value of 1 representing the first unit produced. The second "1" is 10. The third "1" is 100. The fourth "1" is 1,000.

● Always graph the cost in hours or dollars on the vertical axis. The scale will change depending on the data being graphed. The first "1" can be .001, .01, 1, 100, 1,000 or any other integral power of 10. Whatever the value assigned to the first "1," the next "1" is 10 times more, and the next one 10 times more than that. To determine the scale to be used:
  ● Estimate the largest number to be plotted or read on the Y axis. This figure will probably be the theoretical cost of the first unit. For example, suppose this is 60,000 hours.
  ● Determine the next integral power of ten above this number (e.g., the next integral power above 60,000 is 100,000).
  ● Assign this value to the horizontal line at the top of the upper cycle on the Y axis. The horizontal line at the top of the next lower cycle must then represent 10,000 of the same units, and the line at the bottom of the lower cycle represents 1,000.
  ● On log-log graph paper, the distances between numbers on each axis are equal for equal percentage changes. For example, the distance between "1" and "2" is the same as between "4" and "8;" both represent a 100 percent increase.

7.2.3 Log-Log Graph
You can obtain surprisingly accurate results from a log-log graph, but your accuracy greatly depends on your graphing technique.

● Always use a sharp pencil.

● Make points plotted on the paper as small as possible and the lines as narrow as possible.

● When the smallest possible point has been marked on the paper, it may easily be lost sight of or confused with a blemish in the paper. To avoid this, draw a small ring around the point. Circles, triangles, and squares are also used to identify points which belong to different sets of data.

● Exercise great care in drawing a line. If it is supposed to go through a point, it should pass exactly through it, not merely close to it.

A graph of the data described in the example above forms a perfectly straight line when plotted on log-log paper. That is, a straight line passes exactly through each of the points. A straight line on log-log paper indicates that the rate of change is constant.

Since improvement curve theory assumes continuing improvement at a constant rate, the straight line becomes an excellent estimating tool. Assuming that improvement will continue at the same rate, the line can be extended to estimate the cost of future units.
7.2.4 Calculating the Theoretical Value of Unit #1

When we discuss improvement curves, we normally describe them in terms of the theoretical value for Unit #1 and the slope of the curve. With these two values, you can use graph paper, tables, or computer programs to estimate the cost of future units. The value of Unit #1 is referred to as a theoretical value (T1), because in most cases you will not know the actual cost of Unit #1. Instead, T1 is the value indicated by the line-of-best-fit. On a graph, it is the point where the line-of-best-fit and the vertical line representing Unit #1 intersect. (Remember, the graph of the improvement curve always begins with Unit #1.)

7.2.5 Estimating the Slope

The term "slope" as used for improvement curves is a mathematical misnomer. It cannot be related to the definition of slope in a straight line on rectangular coordinates. Instead, the slope of an improvement curve is equal to 100 minus that constant percentage decrease (100 - rate of improvement). You can calculate the slope of a curve, by dividing the unit cost (Yx) at some unit (X) into the unit cost (Y2x) at twice the quantity (2X) and multiplying the resulting ratio by 100. Therefore, you can measure the slope of an improvement curve drawn on log-log paper by reading a cost (Yx) at any quantity, X; reading a cost (Y2x) at any quantity, 2X; dividing the second value by the first; and multiplying by 100.

For example, if the number of hours to make Unit #5 is 70 and the number of hours to make Unit #10 is 50, the slope of the improvement curve is:
Slope = 100 \left( \frac{\frac{Y_{2x}}{Y_x}}{Y_{10} \div Y_3} \right) 
Slope = 100 \left( \frac{50 \div 70} {Y_{10} \div Y_3} \right) 
Slope = 71.4 \% 

**Slope Research Data.** The post-war SRI study revealed that many different slopes were experienced by different firms, sometimes by different firms manufacturing the same products. In fact, manufacturing data collected from the World War II aircraft manufacturing industry had slopes ranging from 69.7 percent to almost 100 percent. These slopes averaged 80 percent.

Research by DCAA in 1970 found curves ranging from less than 75 percent to more than 95 percent. The average slope was 85 percent.

**Slope Selection and Verification.** Unfortunately, information on industry average curves is frequently misapplied by practitioners who use them as a standard or norm. Because each situation is different, you should select a slope based on your analysis of the situation and not on general averages. The order of preference in slope selection is:

- A curve developed from data pertaining to the production of the same product (as we did above).
- The median percentage from a group of curves for items having some similarity to the end item.
- The median percentage from the product category in which the item would most likely be included.

### 7.2.6 Estimating the Cost/Price of Future Units

The primary purpose for estimating an improvement curve is to predict the cost of future production. The prediction is based on the assumption (not always true) that the past is a good predictor of the future. In terms of the unit improvement curve theory, this assumption means that the unit cost (hours or dollars) of doubled quantities will continue to decrease by the same constant percentage.

Using a graph, you can predict future costs by drawing a line-of-best-fit through the historical data graphed on log-log paper and extending it through the unit for which you wish to make a cost estimate. Estimate cost using the Y value (cost) at the point where the two lines intersect.

For example, suppose we had the following unit cost data:

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3,000</td>
</tr>
<tr>
<td>2</td>
<td>2,400</td>
</tr>
<tr>
<td>4</td>
<td>1,920</td>
</tr>
<tr>
<td>8</td>
<td>1,536</td>
</tr>
</tbody>
</table>

Plotting the data on log-log paper, you will observe a straight line with an 80 percent slope.
If you extend the line-of-best-fit to Unit #100, you can estimate the cost of Unit #100. As you can see from the graph, the extended line reveals an estimated cost of approximately 680 hours for Unit #100.

### 7.3 Analyzing Improvement Using Lot Data and Unit Theory

#### Accounting System Data

Use of the improvement curve is dependent on available cost data. The relevant accounting or statistical record system must be designed to make relevant data available for analysis. Costs, such as labor-hours per unit or dollars per unit, must be identified with the unit of product.

**NOTE:** It is preferable to use labor-hours rather than dollars since the dollars contain an additional variable, the effect of inflation or deflation, which the labor-hours do not contain.

Typically accounting systems do not record the cost of individual units. If the firm uses a job-order cost accounting, costs are accumulated on the job order in which the number of units completed are specified and costs are cut-off at the completion of the units. Process cost accounting also yields costs identified with end-item units. In this case, however, the costs are usually assigned to equivalent units produced over a period of time rather than actual units.

#### Average Unit Cost

To use unit improvement curve theory, you must be able to estimate the cost of a particular unit. Given lot or period costs, the only unit cost that we know is the average cost for the lot or period. However, we have a method for using average costs in improvement curve analysis.

For example, given the following data, we must be able to estimate the cost of an additional 40 units.

<table>
<thead>
<tr>
<th>Lot Number</th>
<th>Lot Size (Units)</th>
<th>Lot Total Labor-Hours (Cost)</th>
<th>Lot Average Labor Hours (Cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>40,800</td>
<td>6,800</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>40,500</td>
<td>4,500</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>52,500</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Calculating a Lot Plot Point for Graphic Analysis
To graph the lot average unit cost, we must select a corresponding unit number. If we assume that costs go down during the lot, the average cost should occur at the middle of the lot - the lot mid-point. One problem is that the True Lot Mid-Point (the unit where the average cost is incurred) depends on the slope of the improvement curve. Unfortunately, the slope of the curve also depends on the placement of the Lot Mid-Point. The iterative process required to calculate the True Lot Mid-Point for each lot is too cumbersome for manual computation. As a result, we use the following rules of thumb for graphic analysis:

- **For All Lots After The First Lot**, calculate the lot mid-point by **dividing the number of units in the lot by two**. Then add the resulting number to all the units produced prior to the lot to determine where the unit falls in the continuing improvement curve. For example, what would be the plot point for a lot made up of units 91 through 100. There are 10 units in the lot, so the middle of the lot would be 5 (10 \( \div 2 = 5 \)). Adding 5 to the 90 units produced prior to the lot, we find that the plot point would be 95.
- **For a First Lot of Less Than 10**, follow the same procedure that you follow for all lots after the first lot. Of course, the lot plot point will equal the lot mid-point because no units will have been produced prior to the first lot.
- **For a First Lot of 10 or More**, calculate the lot mid-point by **dividing the number of units in the lot by three**. This adjustment is necessary to compensate for the rapid decline in cost that takes place in the first lot of production.

Given the data above, use a table similar to the following, to calculate the necessary lot plot points and lot average hours:

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Lot Size</th>
<th>Cumulative Units</th>
<th>Lot Mid-Point</th>
<th>Lot Plot Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>6</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>15</td>
<td>4.5</td>
<td>10.5</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>30</td>
<td>7.5</td>
<td>22.5</td>
</tr>
</tbody>
</table>

You can then use this information to estimate the cost of lots that have not yet been produced. For example, suppose you wanted to estimate the cost of a Lot #4 of 40 units to be produced after the 40 units described above. The final row of the table would be:

| 4       | 40       | 70               | 20            | 50            |

For this example, the lot plot point for Lot #4 would be at Unit #50. You would estimate the average unit cost for the lot using the cost of Unit #50.

**Combining Lot Plot Point and Average Unit Cost Calculation**

You can combine the calculation for the lot average unit cost and the lot plot point into a single table, as shown below:

<table>
<thead>
<tr>
<th>Lot N o.</th>
<th>Lot Size</th>
<th>Cumulative Units</th>
<th>Lot Mid-Point</th>
<th>Lot Plot Point</th>
<th>Lot Average Hours</th>
<th>Lot Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>6</td>
<td>3.0</td>
<td>3.0</td>
<td>6,800</td>
<td>40,800</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>15</td>
<td>4.5</td>
<td>10.5</td>
<td>4,500</td>
<td>40,500</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>30</td>
<td>7.5</td>
<td>22.5</td>
<td>3,500</td>
<td>52,500</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>70</td>
<td>20.0</td>
<td>50.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Plotting Data on a Log-Log Graph
Plot the average lot cost data (Y) at the corresponding lot plot point (X) on log-log paper and for an improvement curve. Extend the improvement curve through Unit #50, the lot plot point for Lot #4.

On the Y axis, the lot average cost at Unit #50 is approximately 2,700 labor hours. With this information, you can estimate the cost of Lot #4 at 108,000 labor hours (i.e., 2,700 labor hours x 40 units).

7.4 Fitting a Unit Curve
General Points to Consider
Throughout this chapter, we have assumed that all data fit a perfectly straight line. Unfortunately, most data do not fall exactly on a straight line. You need to be able to identify a trend and fit data to that trend. You can visually fit a line using graphic analysis, but most lines-of-best-fit are developed using regression analysis.

Whatever method of analysis you use to fit an improvement curve, if a data point is a significant distance away from the trend set by other data points, look into the cause of the deviation. If your analysis indicates that the data point is not comparable with the rest of the data for some reason, consider adjusting or eliminating the data point from your analysis. However, never eliminate a data point from your analysis simply because it does not fit the apparent trend set by the remaining data.

Graphic Analysis
When visually fitting a straight line, graph the data then draw the line to minimize the distance between the straight line and the data points. Normally, you should give more weight to the larger lots as you fit the straight line.

When fitting a straight line on ordinary graph paper, you know that the line-of-best-fit must go through the average of the X values ( ) and the average of the Y values ( ). When fitting a line-of-best-fit through improvement curve data on log-log paper, you have no similar fixed reference point. Without this fixed reference point, even skilled analysts can arrive at very different lines.

Regression Analysis
Normally, you can obtain more accurate results using regression analysis and a log-log transformation.
Using the logarithmic values of X and Y instead of the actual values, the equation of the unit improvement curve \( Y = AXB \) becomes:

\[
\log Y = \log A + B \log X
\]

The new equation describes a straight line \( Y = A + BX \) relationship. After this transformation, you can use regression analysis to fit a straight line to the data.

Improvement curve regression analysis programs differ in several ways including:

- **Use of True Lot Mid-Point.**

  In addition to the accuracy gained from using regression analysis, most improvement curve programs use the true lot mid-point rather than the rule-of-thumb calculations described earlier in this section for graphic analysis. The greatest effect of using the true lot mid-point is in the first lot. Examples of the differences between the rule-of-thumb and true lot mid-points are depicted in the following table:

<table>
<thead>
<tr>
<th>Units in First Lot</th>
<th>Rule-of-Thumb</th>
<th>70% Curve</th>
<th>80% Curve</th>
<th>90% Curve</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1.00</td>
<td>1.37</td>
<td>1.39</td>
<td>1.40</td>
</tr>
<tr>
<td>10</td>
<td>3.33</td>
<td>3.95</td>
<td>4.17</td>
<td>4.36</td>
</tr>
<tr>
<td>100</td>
<td>33.33</td>
<td>28.65</td>
<td>32.36</td>
<td>35.43</td>
</tr>
<tr>
<td>1,000</td>
<td>333.33</td>
<td>258.15</td>
<td>304.43</td>
<td>340.67</td>
</tr>
<tr>
<td>10,000</td>
<td>3333.33</td>
<td>2,495.48</td>
<td>3,002.85</td>
<td>3,384.18</td>
</tr>
</tbody>
</table>

Differences in calculating the lot mid-point will affect the results of the improvement curve analysis by the placement of the data points for analysis.

- **Method of Regression.**

  Not all improvement curve analysis programs use the same mathematical model for regression analysis. For example, some analysis programs assign a weight to each lot based on the lot size, while others do not. Software using unweighted regression considers all lots (large and small) equally. When weights are assigned to each lot based on lot size, larger lots receive more analysis consideration than smaller lots.

- **Measures of Fit.**

  - Regardless of the regression model used to develop the line-of-best-fit, virtually all regression analysis software will provide measures of the line’s goodness of fit.
  - The primary goodness of fit measure is the coefficient of determination \( (r^2) \) for the equation. As described in the chapter on "Using Regression Analysis," the coefficient of determination indicates the portion of variation in Y is explained by the regression line (e.g., an \( r^2 \) of .94 indicates that 94 percent of the variation in Y is explained by the relationship between X and Y).
  - Many improvement curve analysis programs also provide the T-test for significance of the regression equation.

- **Graphic Analysis Capability.**

  Many regression analysis programs provide a capability to graph the data and the regression line. For most analysts, this display is one of the strongest tools for identifying anomalies in the data that affect the value of the regression analysis as an estimating tool.

### 7.5 Estimating Using Unit Improvement Curve Tables

#### Estimating Choices

Once the cost of Unit #1, in hours or dollars, and the slope of the improvement curve have been established, we can develop estimates of future costs in several ways. You could graph the data on log-log paper and read your estimates from the graph. You could substitute the values into the improvement curve equation. Many analysts use a third choice, improvement curve tables.
Improvement Curve Tables

Improvement curve tables are an expansion of the $X^B$ portion of the basic unit improvement curve equation, $Y = A X^B$. The result is recorded as a decimal fraction, which is typically calculated to six or eight decimal places. There is a different table value for each unit and slope. Below is an illustration of a partial improvement curve table.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Cum Total</th>
<th>Unit</th>
<th>Cum Total</th>
<th>Unit</th>
<th>Cum Total</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.790000</td>
<td>0.790000</td>
<td>1.800000</td>
<td>0.800000</td>
<td>1.810000</td>
<td>0.810000</td>
</tr>
<tr>
<td>3</td>
<td>2.478245</td>
<td>0.688245</td>
<td>2.502104</td>
<td>0.702104</td>
<td>2.526065</td>
<td>0.716065</td>
</tr>
<tr>
<td>4</td>
<td>3.102345</td>
<td>0.624100</td>
<td>3.142104</td>
<td>0.640000</td>
<td>3.182165</td>
<td>0.656100</td>
</tr>
<tr>
<td>5</td>
<td>3.680837</td>
<td>0.578492</td>
<td>3.737741</td>
<td>0.595637</td>
<td>3.795233</td>
<td>0.613068</td>
</tr>
<tr>
<td>6</td>
<td>4.224550</td>
<td>0.543713</td>
<td>4.299424</td>
<td>0.561683</td>
<td>4.375245</td>
<td>0.580012</td>
</tr>
<tr>
<td>7</td>
<td>4.740494</td>
<td>0.515944</td>
<td>4.839394</td>
<td>0.534900</td>
<td>4.928703</td>
<td>0.553458</td>
</tr>
<tr>
<td>8</td>
<td>5.233533</td>
<td>0.493039</td>
<td>5.351494</td>
<td>0.512000</td>
<td>5.460144</td>
<td>0.531441</td>
</tr>
<tr>
<td>9</td>
<td>5.707214</td>
<td>0.473681</td>
<td>5.838864</td>
<td>0.492950</td>
<td>5.972892</td>
<td>0.512748</td>
</tr>
<tr>
<td>10</td>
<td>6.164223</td>
<td>0.457009</td>
<td>6.315374</td>
<td>0.476510</td>
<td>6.469477</td>
<td>0.496585</td>
</tr>
<tr>
<td>11</td>
<td>6.606656</td>
<td>0.442433</td>
<td>6.777485</td>
<td>0.462111</td>
<td>6.951880</td>
<td>0.482403</td>
</tr>
<tr>
<td>12</td>
<td>7.036189</td>
<td>0.429533</td>
<td>7.228831</td>
<td>0.449346</td>
<td>7.421690</td>
<td>0.469810</td>
</tr>
<tr>
<td>13</td>
<td>7.454188</td>
<td>0.417999</td>
<td>7.664647</td>
<td>0.437916</td>
<td>7.880206</td>
<td>0.458516</td>
</tr>
<tr>
<td>14</td>
<td>7.861784</td>
<td>0.407596</td>
<td>8.092339</td>
<td>0.427592</td>
<td>8.328507</td>
<td>0.448301</td>
</tr>
<tr>
<td>15</td>
<td>8.259928</td>
<td>0.398144</td>
<td>8.510538</td>
<td>0.418199</td>
<td>8.767503</td>
<td>0.438996</td>
</tr>
<tr>
<td>16</td>
<td>8.649429</td>
<td>0.389501</td>
<td>8.920138</td>
<td>0.409600</td>
<td>9.197970</td>
<td>0.430467</td>
</tr>
<tr>
<td>17</td>
<td>9.030982</td>
<td>0.381553</td>
<td>9.321821</td>
<td>0.401683</td>
<td>9.620576</td>
<td>0.422606</td>
</tr>
<tr>
<td>18</td>
<td>9.405190</td>
<td>0.374208</td>
<td>9.716181</td>
<td>0.394360</td>
<td>10.035902</td>
<td>0.415326</td>
</tr>
<tr>
<td>19</td>
<td>9.772580</td>
<td>0.367390</td>
<td>10.103736</td>
<td>0.387555</td>
<td>10.444457</td>
<td>0.408555</td>
</tr>
<tr>
<td>20</td>
<td>10.133617</td>
<td>0.361037</td>
<td>10.484944</td>
<td>0.381208</td>
<td>10.846691</td>
<td>0.402234</td>
</tr>
<tr>
<td>21</td>
<td>10.488713</td>
<td>0.355096</td>
<td>10.860211</td>
<td>0.375267</td>
<td>11.243003</td>
<td>0.396312</td>
</tr>
<tr>
<td>22</td>
<td>10.838235</td>
<td>0.349522</td>
<td>11.229900</td>
<td>0.369689</td>
<td>11.633750</td>
<td>0.390747</td>
</tr>
<tr>
<td>23</td>
<td>11.182513</td>
<td>0.344278</td>
<td>11.594336</td>
<td>0.364436</td>
<td>12.019252</td>
<td>0.385502</td>
</tr>
<tr>
<td>24</td>
<td>11.521844</td>
<td>0.339331</td>
<td>11.953813</td>
<td>0.359477</td>
<td>12.399798</td>
<td>0.380546</td>
</tr>
</tbody>
</table>
Unit Estimate.
To estimate the price or cost for a specific unit, you can simply multiply the cost of Unit #1 by the appropriate unit factor for the desired unit and slope.

Where:
\( Y_U = T_1 \times F_U \)
\( Y_U = \) Unit cost estimate
\( T_1 = \) Theoretical cost of Unit #1
\( F_U = \) Unit cost factor for the unit.

For example, if Unit #1 is 2,000 labor hours, what would be your estimate for Unit #20 if production is expected to follow an 80 percent improvement curve? The table value for Unit #20 and an 80 percent slope is .381208. The estimate would be 762.4 labor hours, calculated as follows:

\[ Y_U = T_1 \times F_U \]
\[ = 2,000 \text{ labor hours} \times 0.381208 \]
\[ = 762.4 \text{ hours} \]

We need to do the same thing for Lot Data:
\[ Y_L = (T_1 \times F_{C2}) - (T_1 \times F_{C1}) \]

Where:
\( Y_L = \) Lot cost estimate
\( T_1 = \) Theoretical cost of Unit #1
\( F_{C2} = \) Cumulative cost factor for all production through the proposed lot
\( F_{C1} = \) Cumulative cost factor for all production prior to the proposed lot

For ease of calculation, this equation may be rewritten as:
\[ Y_L = T_1(F_{C2} - F_{C1}) \]

For example, if Unit #1 is 4,000 labor hours and the improvement curve slope is 80 percent, what would be your estimate for Units #15 to #25? Your estimate should be 15,192.24 labor hours, calculated as follows:

\[ Y_L = T_1(F_{C2} - F_{C1}) \]
\[ = 4,000(12.308597 - 8.092339) \]
\[ = 4,000(4.216258) \]
\[ = 16,865.032 \text{ (rounded to 16,865 labor hours)} \]

7.6 Identifying Issues and Concerns
Questions to Consider in Analysis
As you perform price or cost analysis, consider the issues and concerns identified in this section, whenever you use an improvement curve.

- **Is improvement curve analysis used when the contract effort involves:**
  - A significant amount of manual labor in the contract?
  - Uninterrupted production?
  - Production of complex items?
  - No major technological change?
  - Or should involve, continuous pressure to improve?

- **Does the documentation to support the use of the improvement curve include:**
  - A statement describing the improvement curve theory used in developing the estimate?
  - A summary of related cost data for the product being purchased and any similar
products?
  ○ A description of how available data were used in estimating the theoretical cost of Unit #1 and the slope of the curve?
  ○ A statement on how the improvement curve estimate was used in price or cost analysis?

Like CERs, improvement curves are a form of comparison estimate. Unless you are satisfied that the historical data provide a valid base for the use of an improvement curve, estimates based on the curve should be suspect.

● Was improvement curve theory properly applied to the available data?
  Verify the application of the improvement curve to the data available. Remember that different improvement curve models will produce different results.
For instance, you may find that a unit curve will provide more reasonable results than a cumulative average curve provided by an offeror. Examine the results of both curves when an offeror proposes using a cumulative average curve, because cumulative average curves often conceal significant fluctuations in per unit labor hours.

● Did any improvement curve analysis isolate costs associated with contract changes and production interruptions?
  Changes and production interruptions will both have a disruptive effect on improvement. If their effects are not identified and considered in analysis, improvement curve estimates will typically underestimate actual requirements. Random fluctuations around an improvement curve line-of-best-fit should be expected. However, if costs increase or decrease dramatically, you should suspect that the actual costs have been affected by a contract change or a break in production. When you suspect that actual costs are affected by a contract change or break in production, contact the cognizant auditor and Government technical personnel for assistance in your analysis.
On the other hand, an offeror might overstate the impact of an interruption in production—contending that the interruption has been so long that it will have to start from scratch. However, improvements in unit costs result in part from such factors as better product design, tooling, work methods, and work layout. If these were properly documented, some of the improvement should carry over to the new effort—regardless of the length of the interruption or turnover of personnel.

● Does the improvement curve analysis project continued improvement?
  Occasionally, an offeror will propose "negative learning." In other words, as more units are produced, the cost per unit increases. Do not accept the negative learning argument. If something has significantly changed, consider starting a new curve with a new first unit value and slope.

● Does the improvement curve estimate include the costs of rework and repair?
  The effort for rework and repair may or may not be included in the costs projected with the improvement curve. Therefore, you need to determine if these costs are included in the projected costs before allowing any add-on factors for rework or repair.

8.0 - Chapter Introduction
In this chapter, you will learn about work measurement concepts and their application to cost analysis. Work Measurement. Work Measurement involves the use of labor standards to measure and control the time required to perform a particular task or group of tasks. Most often labor standards are developed and applied in manufacturing operations; however labor standards can be used in estimating and managing the cost of a vast variety of activities including engineering drafting, clerical administration, and janitorial services.

Work Measurement System. A Work Measurement System is a management system designed to:
  ● Analyze the touch labor content of an operation;
  ● Establish labor standards for that operation;
  ● Measure and analyze variances from those standards; and
  ● Continuously improve both the operation and the labor standards used in that operation.

Work Measurement System Plan. A Work Measurement System Plan is the firm’s program for
implementing, operating, and maintaining work measurement in its operations. As a minimum, the plan should provide guidance on:

- Establishing and maintaining standard accuracy;
- Conducting engineering analyses to improve operations;
- Revising standards and related system data; and
- Using labor standards as an input to budgeting, estimating, production planning, and performance evaluation.

Labor Standard Types. A labor standard is a measure of the time it should take for a qualified worker to perform a particular operation. Labor standards are commonly grouped into two types:

- **Engineered standards** are developed using recognized principles of industrial engineering and work measurement. The standards developed define the time necessary for a qualified worker, working at a pace ordinarily used, under capable supervision, and experiencing normal fatigue and delays, to do a defined amount of work of specified quality when following the prescribed method. As a result, you can use engineered standards to examine contractor estimated labor hours and to identify any projected contractor variances from that estimate.

- **Non-engineered standards** are developed using the best information available without performing the detailed analysis required to develop engineered standards. Historical costs are commonly used standards that typically measure the hours that have been required to complete a task rather than the hours that should be required.

Estimate of Efficient Operation Cost. Standards provide information on what it should cost to complete an operation or series of operations in product production. Instead of applying pressure to improve in all areas, managers can use this information to identify areas requiring particular management emphasis. The Acquisition Team can use that same information to identify inefficient operations for close scrutiny during contract negotiations.

The log-log graph below presents a line-of-best-fit developed using actual labor-hour history. Note that this line follows the form of the improvement curve. Without labor standards, the firm and the Government would likely project the improvement curve to estimate the labor hours required to produce future units.
Labor standards provide additional information that can be used in estimate development and analysis. The vertical distance between the labor-hour history and the labor standard represents the variance from the standard. Some of that variance may be related to inefficiencies that cannot be resolved. However, all elements should be targeted for identification and analysis. Key elements include:

- Technical factors (e.g., manufacturing coordination, engineering design changes, fit problems, design errors, operation sheet errors, tooling errors, work sequence errors, and engineering liaison problems).
- Logistics (e.g., incorrect hardware and parts shortages).
- Miscellaneous factors (e.g., unusual working conditions, excessive overtime, and excessive fatigue).
- Worker learning (e.g., familiarity with processes and methods).

Variance analysis should identify, categorize, and develop plans to control all variances from standard. Plans will typically concentrate on the operations with the largest variances from standard, because these operations present the greatest opportunity for cost reduction.

**Updating Standards.** Standards cannot be set and forgotten. Process improvement is one of the central elements of an effective Work Measurement System. As methods improve, the associated labor standards must be updated. Standards changes will affect the estimating value of all the data based on those standards. For example, some variance analyses may remain valid while other analyses will be rendered meaningless as a result of the change. The system must assure that valid analyses are retained for continued utilization. At the same time, the system must also assure that meaningless data are not misused.

### 8.1 - Identifying Situations For Use

**General Situations.** Contractors should consider the use of labor standards whenever contractor
employees will be performing the same tasks repetitively over an extended period of time. Labor standard development requires extensive detailed effort. The time and cost required for standards development are prohibitive unless the task will be performed repetitively. On the other hand, when an operation will be performed repetitively, the cost visibility provided by labor standards permits detailed cost evaluation and control that can result in significant savings to the Government. To be of real value, labor standards must be considered in making key management decisions (e.g., budgeting, estimating, production planning, and performance evaluation).

8.2 Identifying Elements Of A Labor Standard

**Key Elements.** As a contracting officer, it is likely that you will never be required to develop a labor standard. However, you may be called upon to negotiate a contract price based, in part, on labor standards. Therefore, you should know the elements of a standard and how they are developed. The figure below depicts some of the factors that should be considered in each element.

![Diagram of labor standard elements]

**Leveled Time.** Leveled time is the time that a worker of average skill, making an average effort, under average conditions, would take to complete the required task. There are a variety of techniques used in leveled time development, but the four used most commonly are:

- **Time Study.** In performing a time study, industrial engineers (or other labor analysts) time the effort required to perform a defined task. While it may sound simple, this is a complex process that requires special training and experience. To perform a time study, the analyst must:
  - Clearly define and document the work design, including the best design of the work place, tools, tasks, and subtasks.
  - Select a person to be timed. The person selected should be receptive to being timed, experienced in the work methods being used, and familiar with the tasks and subtasks of the work design.
  - Observe and record the time that the selected worker requires to perform each of the subtasks in the work design. Several observations are required to average out random
variations and assure that all elements of the work have been considered. The number of observations required will increase as the confidence level desired by the analyst increases and as the variability between observed times increases.

- Assign a pace rating based on an evaluation of how the ability and effort of the worker being timed compares with those of an average worker. Using the pace ratings, the analyst converts observed times into a leveled time for the subtask.
- Total subtask times to develop a leveled time for the entire task.

- **Predetermined Leveled Times.** Instead of using time study to develop a leveled time, the analyst can use predetermined leveled times (also called predetermined standards or basic motion standard data). Predetermined leveled times are established for basic body motions, such as reach, move, turn, grasp, position, release, disengage, and apply pressure. The analyst may obtain them from published standards in tabular or electronic forms, or the firm may develop its own. To use predetermined leveled times, the analyst must:
  - Clearly define and document the work design, including the best design of the work place, tools, tasks, and subtasks.
  - Select and document the source of the predetermined leveled times.
  - Identify and document the basic body motions involved in performing each subtask. Motions for each hand must be specifically identified. The need for precise measurement of complex body motions for each job element may make this method of leveled time development inappropriate for complex tasks with long performance cycle times.
  - Assign times to the body motions required to complete each subtask and total assigned times to develop a leveled time for the subtask. Documentation should demonstrate that the accuracy of the original data base has not been compromised in application or standard development.
  - Total subtask times to develop a leveled time for the entire task.

- **Standard Time Data.** Standard time data (or elemental standard data) are developed for groups of motions that are commonly performed together, such as drilling a hole or painting a square foot of surface area. Standard time data can be developed using time studies or predetermined leveled times. After development, the analyst can use the standard time data instead of developing an estimate for the group of motions each time they occur.
  - Typically, the use of standard time data improves accuracy because the standard deviations for groups of motions tend to be smaller than those for individual basic motions. In addition, their use speeds standard development by reducing the number of calculations required.
  - Estimate development using standard time data is much like using predetermined leveled times except that groups of motions are estimated as a single element instead of individual body motions.

- **Work Sampling.** Work sampling is commonly used to develop non-engineered standards. It cannot be used alone to develop engineered standards. However, it can be used to supplement or check standard development by more the definitive techniques described above. For example, it can be used to determine job content and assess productive vs. nonproductive time.
  - In work sampling, analysis is based on a large number of random, rather than continuous observations. Estimates are based the proportion of time spent by one or more persons on a given activity. This is useful for jobs with irregular components that vary in the amount of time per unit of output.
  - To use work sampling in standard development, the analyst must:
    - Identify and define activities involved in the work (through discussions with the workers and preliminary observations).
    - Develop the method(s) for observing and recording activities.
    - Determine the sampling strategy (e.g., stratified) and number of observations (by time and place).
    - Record observed activities during each period.
    - Consolidate and analyze the data.
Use the data collected to develop nonengineered standards or to supplement development of engineered standards.

**PF&D Allowance**. After the leveled time is developed, estimators must consider a personal, fatigue, and delay (PF&D) allowance. Be careful when contractors use predetermined time systems. Some predetermined time systems include a partial or complete allowance for PF&D. If the contractor uses such standards, additional PF&D consideration may not be appropriate. Contractor work measurement policies and procedures should provide the detailed rationale used for applying PF&D allowances. Each allowance should be identified and quantified. Total PF&D allowances typically total 15 percent. However, allowances may be higher or lower depending on the nature of the work and related working conditions. For example, strenuous work in an extremely hot environment would typically merit a higher PF&D allowance than light labor performed in an air conditioned room.

**Personal Allowance.** A personal allowance considers time for a worker to take care of personal needs, such as trips to the rest room and drinking fountain. The table below

<table>
<thead>
<tr>
<th>Personal allowance documentation should document:</th>
<th>Considerations</th>
<th>Typical Percentage Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Basic Allowance which considers the breaks available for work during an 8-hour day.</td>
<td>Most firms allow, at least, two 10-minute breaks during each 8-hour shift, the basic personal allowance is 4.2 percent (20 minutes/480 minutes).</td>
<td>4.2</td>
</tr>
<tr>
<td>Normal office conditions</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Normal shop, central heat, slightly dirty or greasy.</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Slightly disagreeable conditions. Exposed to inclement weather part of the time, poor heating, or poor cooling.</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Extremely disagreeable conditions. Proximity to hot objects, continuous exposure to disagreeable odors and fumes, or to excessive temperature ranges.</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Total time allowed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 minutes</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>10 minutes</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>15 minutes 20 minutes</td>
<td>3.1 4.2</td>
<td></td>
</tr>
<tr>
<td>Any allowance for work performed in a super-clean</td>
<td>An additional allowance may be added to consider the time</td>
<td>4.0</td>
</tr>
</tbody>
</table>
require to assure that super-clean room requirements are met.

**Fatigue Allowance.** A fatigue allowance considers the time required to recuperate from fatigue.

<table>
<thead>
<tr>
<th>Personal allowance documentation should document:</th>
<th>Considerations</th>
<th>Typical Percentage Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any allowance for handling heavy weights.</td>
<td>Effective Net Pounds Percent of Time Under Load Handled 1-12 13-25 26-50 51-75 76-100 1-10 0 1 2 3 4 11-20 1 3 5 7 10 21-30 2 4 9 13 17 31-40 3 6 13 19 25 41-50 5 9 17 25 34 51-60 6 11 22 x x 61-70 7 14 28 x x 71-80 8 17 34 x x x - Study for possibilities for worker rotation and other means to relieve fatigue.</td>
<td>Select percentage from table.</td>
</tr>
<tr>
<td>Multiply the table values above by the following factors to consider lifting requirements: For picking up from the floor, multiply the table value by 1.10. For placing the load above chest height, multiply table value by 1.20. For getting the load from chest height, multiply the basic allowance by 0.50.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For sliding and rolling objects, multiply the weight by the coefficient of friction to determine the effective weight moved. Coefficients of Friction (Average Values) Surfaces Friction Coefficient Wood on Wood 0.4 Wood on Metal 0.4 Metal on Metal 0.3</td>
<td>Depends on work.</td>
<td></td>
</tr>
<tr>
<td>Sitting or standing. (Work will</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>
normally be less tiresome if the position is varied frequently.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting</td>
<td>1.0</td>
</tr>
<tr>
<td>Walking</td>
<td>1.0</td>
</tr>
<tr>
<td>Standing</td>
<td>2.0</td>
</tr>
<tr>
<td>Climbing or descending ramps, stairs, or ladder</td>
<td>4.0</td>
</tr>
<tr>
<td>Working in close cramped quarters</td>
<td>7.0</td>
</tr>
<tr>
<td>Work largely committed to habit (e.g., simple calculations on paper, reading easily understood material, counting and recording, simple inspection requiring attention but little discretion, or arranging papers by letter or number.)</td>
<td>0.0</td>
</tr>
<tr>
<td>Work requires full attention (e.g., copying numbers or instructions, remembering part number while checking a parts list, or filing papers by subject of familiar nature.)</td>
<td>2.0</td>
</tr>
<tr>
<td>Work requires concentrated attention (e.g., reading of nonroutine instructions or cross-checking items.)</td>
<td>4.0</td>
</tr>
<tr>
<td>Work requires deep concentration (e.g., making swift mental calculations or memorizing items.)</td>
<td>8.0</td>
</tr>
<tr>
<td>Continual glare on work area. Work requiring constant change of light. Less than 75 foot candle power on work surface for normal work. Less than 125 foot candle power on work surface for close work.</td>
<td>2.0</td>
</tr>
<tr>
<td>Constant, rather loud noises over 60 decibels (e.g.,</td>
<td>1.0</td>
</tr>
</tbody>
</table>
machine shops or motor test shops).

<table>
<thead>
<tr>
<th>Noise Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average constant noises, level but with loud, sharp, intermittent, or staccato noise (e.g., nearby riveters or punch presses).</td>
<td>2.0</td>
</tr>
<tr>
<td>0.00 to 0.20 minute cycles</td>
<td>4.0</td>
</tr>
<tr>
<td>0.21 to 0.40 minute cycles</td>
<td>3.0</td>
</tr>
<tr>
<td>0.41 to 0.80 minute cycles</td>
<td>2.0</td>
</tr>
<tr>
<td>0.81 to 2.50 minute cycles</td>
<td>1.0</td>
</tr>
<tr>
<td>2.51 minutes or more</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Any allowance for the use of safety devices or clothing. No allowance should be made here unless it is necessary to remove the equipment occasionally for relief or if wearing the item causes fatigue.

<table>
<thead>
<tr>
<th>Personal Protective Equipment</th>
<th>Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face shield</td>
<td>2.0</td>
</tr>
<tr>
<td>Rubber boots</td>
<td>2.0</td>
</tr>
<tr>
<td>Goggles or welding mask</td>
<td>3.0</td>
</tr>
<tr>
<td>Tight, heavy protective clothing</td>
<td>4.0</td>
</tr>
<tr>
<td>Filter mask</td>
<td>5.0</td>
</tr>
<tr>
<td>Safety glasses</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Delay Allowance.** A delay allowance covers unavoidable, predictable and unpredictable delays for such activities as replenishing materials, rejecting nonstandard parts, making minor equipment repairs, and receiving instructions.

<table>
<thead>
<tr>
<th>Delay Allowance Considerations</th>
<th>Typical Percentage Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal allowance documentation should document:</td>
<td>Considerations</td>
</tr>
<tr>
<td>Basic Allowance</td>
<td>Isolated job. Little coordination with adjacent jobs.</td>
</tr>
<tr>
<td></td>
<td>Fairly close coordination with adjacent jobs.</td>
</tr>
<tr>
<td>Worker moves once each 5 minutes.</td>
<td>5.0</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Worker moves once each 30 minutes.</td>
<td>3.0</td>
</tr>
<tr>
<td>Worker moves once each 60 minutes.</td>
<td>2.0</td>
</tr>
<tr>
<td>Worker moves once each 2 hours.</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Special Allowances.** Any proposed special allowance must be supported by detailed engineering analysis. An appropriate study should be conducted in each shop or functional area to ascertain any requirement for a separate delay allowance. The analyst should assure that there is no duplication between cycle time elements and allowance elements and that the Special Allowance does not become a dumping ground for operation activity that is not an integral part of shop work load.

- Work elements such as cleaning chips from equipment, tool care, or tool replacement, though occurring irregularly, should be measured and the time required prorated directly to the machine operating portion of the work cycle rather than as an allowance.
- Certain other irregularly occurring elements having a direct relationship to the job such as obtaining parts and materials and periodic inspection should be added to the cycle time on a prorated basis or as a separate work element rather than added as an allowance.

When a special allowance is appropriate, the time required is first calculated in minutes and then converted to a percentage. The base for calculating and applying the allowance percentage is normally the sum of the leveled time and the PF&D allowance. Appropriate special allowances typically fall into two categories:

- Those that consider elements that occur on an unforeseeable basis:
  - Power failures of nonreportable duration.
  - Minor repairs to defective parts.
  - Waiting for a job assignment.
  - Obtaining job information from a supervisor, inspector, or production control specialist.
  - Unsuccessful hunt for parts or materials.
  - Machine breakdown of nonreportable duration.
- Those that consider elements that occur periodically (daily, weekly, hourly) such as:
  - Cleaning and lubricating equipment.
  - Work area clean-up.

**Applying an Allowance to Leveled Time.** Allowances are normally expressed as a percentage of standard time spent unproductively (e.g., a 15 percent PF&D Allowance indicates that 15 percent of the worker’s standard time is spent unproductively). To apply an allowance, the analyst must determine how much the leveled time must be increased to allow for the unproductive time. This is accomplished by dividing the leveled time by the percentage of time spent productively.

\[
T_s = \frac{T_L}{1.00 - A_{PF&D}}
\]

Where:
- \(T_S\) = Standard time
- \(T_L\) = Leveled time
- \(A_{PF&D}\) = PF&D allowance in decimal form

**For example:** The leveled time for a particular task is 170 minutes, the PF&D Allowance is 15 percent, and there is no special allowance. The standard time would be calculated as:
8.3 - Measuring And Projecting Operation Efficiency

Comparing Labor Standard with the Actual Time. Standards represent goals for efficient operation. Tasks are rarely completed in the allowed standard time. Work Measurement Systems commonly use realization or efficiency factors to evaluate how the actual time required to complete a task compares with the standard time for that task. Analysts can then use these measures to identify tasks that require special analysis to identify and correct inefficient operations.

Since estimators strive to estimate realistic contract costs, they use realization or efficiency factors with labor standards to estimate future labor hours required to complete the task.

Calculating a Realization Factor. A realization factor is generally a measure of overall performance (e.g., shop, product line, or plant). It will normally be calculated from historical data as:

\[ F_R = \frac{T_A}{T_s \times R} \]

Where:
- \( F_R \) = Realization factor
- \( T_A \) = Acutal time to perform the work
- \( T_s \) = Standard hours for the task
- \( R \) = Repetitions of the task included in the work

Don't be confused by the fact that some firms refer to this calculation as an efficiency factor.

For example: A task has a standard time of 1.5 hours. Actual time to perform the task 100 times is 300 hours. Using the model at ***, the realization factor would be 2.00

\[ F_R = \frac{T_A}{T_s \times R} = \frac{300}{150 \times 100} = 2.00 \]

In the above example, actual experience shows that the work takes twice as many hours as the standard time indicates.

Developing an Estimate Using a Realization Factor. The estimator can use the standard time and realization factor to develop a realistic labor-hour estimate using the model at ***.

For example. An estimate of the actual time to complete the task above for 50 units would be calculated as:

\[ Y = T_s \times R \times F_R \]

\[ = 1.5 \times 50 \times 2.00 \]

\[ = 150 \text{ labor hours} \]

Where:
- \( Y \) = Estimated hours

All other symbols are as defined above.

Calculating an Efficiency Factor. An efficiency factor is calculated to demonstrate efficiency against the
standard (e.g., a task with an efficiency factor of .60 is being performed at 60 percent efficiency). The factor is normally calculated:

\[ F_E = \frac{T_s \times R}{T_A} \]

Where:
- \( F_E \) = Efficiency factor
- All other symbols are as defined above

**For example.** A task has a standard of 1.8 hours. Actual time to perform the task 100 times is 400 hours. The efficiency factor would be calculated as follows:

\[ F_E = \frac{T_s \times R}{T_A} = \frac{1.8 \times 100}{400} = \frac{180}{400} = .45 \text{ or 45 percent efficiency} \]

*Developing an Estimate Using an Efficiency Factor.* The estimator can use the standard time and efficiency factor to develop a realistic labor-hour estimate.

**For example.** An estimate of the time to complete the task above for 50 units would be calculated as:

\[ Y = \frac{T_s \times R}{F_E} = \frac{1.8 \times 50}{.45} = 200 \text{ labor hours} \]

*Analyzing Realization and Efficiency Factors.* Analysis of labor estimates developed using labor standards requires extensive knowledge and experience. Even skilled industrial engineers typically require special training in work measurement analysis. As a result, you should normally request technical support whenever an offeror estimates labor hours using labor standards.

For each standard, offerors should be required to provide information on internal analyses of the variance between the actual time required to complete the work and the standard time to determine the causes for the variance and identify ways of managing performance improvement.

You should expect offeror’s to demonstrate continued improvement in realization and efficiency factors. The figure below depicts some of the reasons for that improvement.

- At Unit #1, total labor-hours include substantial inefficiencies related to technical, logistics, learning, and other factors.
- As production increases, there should be reductions in all areas of inefficiency. In most cases, there should also be an improvement in the labor standard itself, as better production methods are identified and implemented.
- By Unit #1000, the contractor should be operating efficiently, with only minor inefficiencies related to such factors as unavoidable parts shortages.
However, improvement will not automatically follow this pattern. Effective analysis and management effort are required. Even when these are present, improvement may be hampered by factors such as repeated changes in design or production methods.

Still, the goal of both the contractor and the Government should be continuous improvement. Even when operations are being performed at or close to standard, the contractor should be searching for methods improvements that will reduce costs and improve overall efficiency.

**Projecting Realization and Efficiency Factors.** Be cautious of any estimate for continuous production that does not consider variance reduction following the improvement curve. Continuous improvement is one of the reasons for using labor standards, because standards provide detailed information on the areas that offer the greatest opportunity for improvement.

Improvement curves and moving averages are commonly used to project variation from labor standards. Either technique can be acceptable depending on the situation. Technical assistance can be very valuable in evaluating offeror forecasts.

- **Improvement Curves.** Using an improvement curve to track and project variance from a labor standard assumes that the variance is related to the number of units produced. As more units are produced, the variance is expected to decline following improvement curve theory.

- **Moving Averages.** Firm's often use moving averages to track and project variance from a labor standard when the variance is not expected to follow an improvement curve. This assumption is often valid when product production is not continuous or there are frequent changes in design or production methods.

  - While moving averages are an acceptable way to track and project variances, do not forget that a firm could be using a moving average to hide a downward trend in the data. That is particularly true in cases where the firm proposes a single moving average
calculated over a large number of periods.

- Government technical personnel can provide invaluable assistance in assuring that averages are not masking a trend in the data and that data from one or two periods are not unduly affecting the average.

8.4 Identifying Issues And Concerns

Questions to Consider in Analysis. As you perform cost analysis, consider the issues and concerns identified in this section, whenever you use work measurement.

- **Is the offeror using available standards and realization or efficiency factors to estimate contract cost?**
  If the offeror has an active Work Measurement System, the System provides vital insight into direct labor costs. Information on related time standards and variance analysis are cost or pricing data and must be provided by the offeror whenever you require cost or pricing data. You should also consider requesting information on time standards and variance analysis, whenever you require an offeror to submit information other than cost or pricing data.

- **Were standards developed using appropriate process analysis and accepted methods of standard development?**
  Many firms refer to historical costs as standards. Using historical costs does not provide the methods analysis and engineering discipline normally associated with the use of engineered labor standards in estimating.

- **Are realization or efficiency factors based on experience with the same or similar products and processes?**
  In a cost proposal, either factor should consider experience with the same product or similar products and processes. A realization standard at one facility should not be used at another facility unless the conditions are the same. Do not compare realization factors for one facility with those for other facilities.

- **Are standards and factors current?**
  The data used to develop standards should be current and representative of current methods, facilities, and working conditions. Realization/efficiency factors should be based on the current standards. If you have questions or concerns, seek assistance from Government technical and audit representatives.

- **What efforts are being taken to control variance from labor standards?**
  Reasons for the differences between the standard hours and actual hours should be explained. Improvement curves are often used to estimate the reduction of variances from standard as production continues. Setting and achieving aggressive goals for improvement of realization or efficiency factors beyond historical improvement curve effects should be a prime factor in reviewing contractor performance.

- **How are rework and repair considered in the estimate?**
  Rework and repair occur when a part or assembly is rejected in an inspection or test and sent back for correction of the deficiency. In addition, some completed parts and assemblies must be reworked to incorporate design changes. The cost of rework should not be included in the labor standard, related allowances, or the realization factor. Instead, time spent on rework should be accounted for separately. However, labor standards can be used in estimating the labor effort required for rework. Historical rework costs should be carefully screened to eliminate rework costs associated with one-time problems or changes.

- **Is the method used for realization or efficiency factor forecasting appropriate?**
  Use of improvement curves is appropriate in continuous production situations that should foster variance reduction. Use of moving averages is appropriate in situations where sporadic production or other factors hamper efforts to reduce any variance from standard.
9.0 - Chapter Introduction

In this chapter, you will learn to use net present value analysis in cost and price analysis.

**Time Value of Money.** The time value of money is probably the single most important concept in financial analysis. When we say that money has time value, we mean that a dollar to be received today is worth more than a dollar to be received at any future time. Money has a time value because of the opportunity to earn interest or the cost of paying interest on borrowed capital.

For example, assume that you need to buy a new car but do not have the money that you need to pay for it. You must borrow the entire purchase price. Two dealers offer to sell you identical cars for $21,000. Dealer #1 requires cash on delivery. Dealer #2 will provide you an interest-free loan for one year. Where would you buy the car? Probably from Dealer #2, because you will save all the interest for the first year of ownership.

**Present Value.** In the example above, Dealer #2 was clearly the low-cost choice (because of the interest-free loan for one year), but what if Dealer #1 offered the car at a lower price, say $20,000? Which would be the low-cost choice then?

To make that decision, you must be able to determine the present value of each alternative. If you could invest $20,000 at 5.0 percent interest, it would be worth $21,000 at the end of one year. Based on that calculation, we could say that $20,000 is the present value of $21,000 one year from now when the interest rate is 5.0 percent. At that interest rate, you would presumably be indifferent about where to buy your car because the present value of the two choices is the same.

**Net Present Value.** Calculating present value may involve receipts as well as expenditures. For example, the alternatives may have some salvage value after their useful life has ended. The estimated receipt from the sale of the item must be considered in your analysis. The difference between the present value of the receipts and the present value of the expenditures is net present value. The best financial choice is the alternative with the highest net present value. In procurement, the alternative with the highest net present value is the alternative with the smallest payment net present value.

**Factors Affecting Net Present Value.** The major factors affecting present value are the timing of the expenditure (receipt) and the discount (interest) rate. The higher the discount rate, the lower the present value of an expenditure at a specified time in the future. For example, as you learned above, $20,000 is the present value of $21,000 one year from now when the interest rate is 5.0 percent. If the interest rate were 10.0 percent, $19,091 would be the approximate present value of $21,000 one year from now. Note that the change in the interest rate would have a significant affect on your net present value analysis in the car case. Your choice is still to pay $20,000 now or $21,000 a year from now. At an interest rate of 10 percent the present value of $21,000 to be paid a year from now is $19,090.90, which is less than the $20,000 offer. So it appears that the low-cost choice is to wait and pay the $21,000 in one year.

Office of Management and Budget (OMB) delineates the rates that you should use in Government net present value analysis. These rates are based on the rate that the Treasury Department pays to borrow money for periods from 91 days to 30 years. These rates are updated annually at the time of the President's budget submission to Congress. These rates can be found in **Appendix C - OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs**, or obtained by telephoning (202) 395-3381.

**Net Present Value Analysis.** Regardless of the application, you should use this 5-step process in net present value analysis:

**Step 1.** Select the discount rate.
**Step 2.** Identify the costs/benefits to be considered in analysis.
**Step 3.** Establish the timing of the costs/benefits.
**Step 4.** Calculate net present value of each alternative.
**Step 5.** Select the offer with the best net present value.

**Lease-Purchase Analysis Examples (OMB Circular A-94, Paragraph 13).** In this chapter, we will demonstrate the application of net present value analysis concepts using lease-purchase examples. Our use of these examples is not meant to ignore other uses of net present value analysis in Government contracting.
9.1 - Identifying Situations For Use

OMB Suggested Use (FAR 23.203 and OMB Circular A-94). Unless precluded by agency procedures, OMB Circular A-94 suggests the use of net present value analysis in any analysis to support Government decisions to initiate, renew, or expand programs or projects which would result in a series of measurable benefits or costs extending for three or more years into the future. Examples of acquisition decisions that involve such analyses include:

- Lease-purchase analyses;
- Analyses of different lease alternatives;
- Life-cycle cost analyses; and
- Trade-off analyses considering acquisition costs and energy-utilization costs of operation.

Required Lease-Purchase Analysis (OMB Circular A-94, Paragraph 13). In addition to the suggested application to any benefit-cost analysis, OMB Circular A-94 requires that any decision to lease a capital asset be justified as preferable to direct Government purchase and ownership in situations where both of the following are true:

- The lease-purchase analysis concerns a capital asset or a group of related assets whose total fair market value exceeds $1 million.
- The lease-purchase analysis concerns a capital asset (including durable goods, equipment, buildings, facilities, installations, or land) which is:
  - Leased to the Government for a term of three or more years;
  - New, with an economic life of less than three years, and leased to the Government for a term of 75 percent or more of the economic life of the asset;
  - Built for the express purpose of being leased to the Government; or
  - Leased to the Government and clearly has no alternative commercial use (e.g., a special-purpose Government installation).

The analysis conducted in support of that justification should involve net present value analysis and can be performed in one of three ways, as delineated in the table below:

<table>
<thead>
<tr>
<th>Methods of Lease-Purchase Analysis</th>
<th>Use...</th>
</tr>
</thead>
</table>
| Conduct a separate lease-purchase analysis for each acquisition. | Only for major acquisitions. A lease is a major acquisition when one of the following is true:  
  - Acquisition is a separate line item in the Agency's budget.  
  - The agency or the OMB determines that the acquisition is a major one.  
  - The total purchase price of the asset or group of assets will exceed $500,000. |
| Conduct periodic lease-purchase analysis of the recurring acquisition of assets for the same general purpose. | For an entire class of assets. |
| Adopting a policy for smaller leases and submitting the policy to OMB for approval. | Normally after the agency demonstrates that:  
  - The leases in question would generally result in substantial savings to the Government.  
  - The leases in question are so small or so short as to make separate analyses impractical.  
  - Leases of different types are scored consistent with the requirements of OMB Circular A-11, Preparation and Submission of Annual Budget Estimates. |
9.2 - Selecting A Discount Rate

**OMB Discount Rate Guidance** (OMB Circular A-94, Appendix C). Unless precluded by agency practice, you should use the current discount rates contained in OMB Circular A-94, Appendix C.

*Nominal Treasury Rates* (OMB Circular A-94, Appendix A & Appendix C). For most benefit-cost analysis you should use nominal discount rates (i.e., discount rates that include the effect of actual or expected inflation/deflation). *Real Treasury Rate* (OMB Circular A-94, Appendix A & Appendix C). For some projects (e.g., long-term real estate leases), you may find it more reasonable to state payments in terms of stable purchasing power (that is, constant dollars) and adjust them separately using a pre-determined price index. In such situations, cash flows should be discounted using the real Treasury borrowing rate for debt of comparable maturity. The real Treasury rate is the nominal Treasury rate adjusted to eliminate the effect of anticipated inflation/deflation. These rates are also contained in OMB Circular A-94, Appendix C and are updated annually.

**Selecting the Rate for Analysis.** Whether you are using nominal or real Treasury rates, match the rate to the analysis period (e.g., use 5.6 percent to discount all expenditures/receipts for a 3-year lease analysis).

To analyze a project requiring analysis for a period different from those presented above, use linear interpolation to determine the appropriate discount rate.

**Step 1. Estimate the change in the discount rate for each year between the next lower and next higher maturity period with identified discount rates.**

\[ R_c = \frac{M_2 - M_1}{R_2 - R_1} \]

Where:

- \( R_c \) = Change in the discount rate for each year difference in the project maturity period
- \( M_1 \) = Next lower maturity period with an identified discount rate
- \( M_2 \) = Next higher maturity period with an identified discount rate
- \( R_1 \) = Discount rate for maturity period \( M_1 \)
- \( R_2 \) = Discount rate for maturity period \( M_2 \)

**Step 2. Calculate the interpolated rate using the rate for the next lower maturity period with an identified rate and the estimated change in the discount rate for each year difference in the maturity period.**

\[ R_I = R_1 + R_c (M_P - M_1) \]

Where:

- \( R_I \) = Interpolated discount rate for the project maturity period
- \( M_P \) = Maturity period for the project

All other symbols are as defined above

**Linear Rate Interpolation Example.** The following example demonstrates the steps involved in interpolating a nominal interest rate for evaluating an 8-year lease:

**Step 1. Estimate the change in the discount rate for each year between the next lower and next higher maturity period with identified discount rates.**

\[ R_c = \frac{M_2 - M_1}{R_2 - R_1} = \frac{5.9 - 5.8}{5.9 - 5.8} = \frac{10 - 7}{3} = \frac{.1}{3} = .033 \]

**Step 2. Calculate the interpolated rate using the rate for the next lower maturity period with an identified rate and the estimated change in the discount rate for each year difference in the maturity period.**

\[ R_I = R_1 + R_c (M_P - M_1) = 5.8 + .033 (8 - 7) \]
9.3 - Identifying Cash Flows To Consider

Cash Flow. A cash flow is a receipt or expenditure related to the proposed lease or purchase. Guidance on the costs/benefits that you should consider in lease-purchase analysis is provided in both FAR and OMB Circular A-94. The solicitation should require each offeror to identify relevant cash flows associated with its proposal. Remember, the purpose of the Government evaluation is to identify the best net present value.

Analysis Period (OMB Circular A-94, Paragraph 13c8). In lease-purchase analysis, the proper period for analysis is the lease period including all renewal options. The period of the projected lease must be defined in the solicitation to assure identification and analysis of all relevant cash flows.

Points to Consider in Identifying Costs and Benefits for Analysis (OMB Circular A-94, Para 6a1 & 13c1). Lease-purchase analysis should compare the net present value of the incremental costs related to leasing the asset with the incremental costs related to purchasing (or constructing) and owning the asset. You should consider incremental costs associated with acquisition as well as the ancillary costs related to acquisition and ownership. Use the following general guidelines as you identify incremental benefits and costs to include in your analysis:

- Analysis should consider costs or benefits associated with one alternative in the evaluation of other alternatives. For example, if the lease payments include maintenance, the purchase alternative should also include the cost of maintenance.
- Analysis should consider costs or benefits that will be different for different alternatives. For example, if different alternatives will use substantially different amounts of electricity, the cost of electricity should be considered.
- Analysis should not consider sunk costs or benefits. Past experience is relevant only in helping to estimate future costs or benefits. For example, if the Government has decided to replace existing equipment, the value of that equipment is not relevant.
- Analysis should not consider costs which will be identical for all alternatives. For example, if the Government has decided to replace existing equipment, the cost of removing that equipment is not relevant because it must be accomplished for all alternatives.

Examples of Lease-Purchase Costs and Benefits Commonly Considered (FAR 7.401 and OMB Circular A-94 Paragraph 13c).

Lease-purchase analysis is one area where you might be required to use net present value analysis. The costs and benefits identified below for lease-purchase analysis demonstrate the type of cash flows that you should consider in a net present value analysis.

- **Net Purchase Price.** Any net present value analysis of a decision to purchase an asset must consider the purchase price. OMB defines the purchase price of the asset as the price a willing buyer could reasonably expect to pay a willing seller in a competitive market to acquire the asset. Normally, lease-purchase decisions do not consider trade-ins of existing equipment. Disposal of existing equipment should be handled following agency property disposal procedures and considered as part of disposal costs and salvage value as presented below.
- **Lease Payments.** Any decision to lease property using net present value analysis must consider the amount and timing of lease payments.
- **Ancillary Services.** If ancillary costs differ between alternatives, they should be considered. (If costs and timing are the same for all alternatives, they need not be considered.) Both OMB Circular A-94 and the FAR provide guidance on the ancillary costs and benefits that you should consider in lease-purchase analysis. The following points combine the recommendations from both sources:
  - All costs associated with acquiring the property and preparing it for use including:
    - Costs;
    - Transportation;
    - Installation;
    - Site preparation;
- Design; and
- Management.

○ Repair and improvement costs, including:
  - Estimated unplanned service calls; and
  - Improvements projected to be required during the lease period to assure continued operation.

○ Operation and maintenance costs, including:
  - Operating labor and supply requirements; and
  - Routing maintenance.

○ Disposal costs and salvage value, including the:
  - Cost of modifications required to return related equipment to its original configuration;
  - Cost or modifications required to return related facilities to their original configuration; and
  - Equipment value to the Government at the end of the lease period (e.g., salvage value).

9.4 - Determining Cash Flow Timing
The timing of cash flows is a vital element of any net present value analysis. This section presents two methods for considering that timing.

- 9.4.1 - Discount Factors for End-of-Year Payment
- 9.4.2 - Discount Factors for Mid-Year Payment

General Equation for Present Value Calculation. You can compute the present value of any cash flow (expenditure/receipt) in the future, by multiplying the amount by the appropriate discount rate:

\[ PV = DF(CF) \]

Where:
- PV = Present value
- DF = Discount factor
- CF = Cash flow

Discount Factors. The discount factor that you use in net present value analysis will depend on the discount rate that you use and the timing of the cash flow. In defining the timing of the cash flow, you must identify the year and the timing during the year. There are two commonly used assumptions about when during the year the payment occurs:

- End-of-year payment -- use this assumption when a single payment is made at the end of the year or the beginning of the year.
  - A payment that is due immediately is not discounted.
  - A payment that is due at the beginning of Year \( t \) is evaluated as a payment due at the end of Year \( t-1 \). For example, payments due at the beginning of Year 2 and Year 3 will be treated as if they are due at the end of Year 1 and Year 2.

- Mid-year payment -- use this assumption when a single payment will be made mid-year or payments will be made at regular intervals throughout the year.

Offer-Identified Cash Flows. Solicitations must require all offerors to clearly define the amount and timing of each cash flow (expenditure/receipt) unique to the proposal. The proposal should also include a rationale to support the timing of any cash flow unless the timing is set forth in the contract.

For example: The timing of lease payments does not require any additional support because the timing (e.g., monthly, quarterly, or annually) is defined in the lease agreement. However, the lease agreement may include additional charges (e.g., on-call equipment repair). For such charges, the rationale for both the estimated expenditure and its timing should be clearly defined in the proposal.

Government-Identified Cash Flows. Government technical personnel must identify cash flows related to different proposals that are beyond the control of the offerors.

For example: The amount and timing of expenditures related to Government ownership must also be identified prior to proposal evaluation. Normally, Government personnel will be responsible for preparing these estimates based on available information. However, each offeror may be required to provide information required to develop these estimates (e.g., costs to modify equipment to meet anticipated
changes in Government requirements).

9.4.1 - Discount Factors For End-Of-Year Payment

*When to Use End-of-Year Discount Factors.* Use end-of-year discount factors when payments are due at the end of the year or the beginning of the year. Remember, that a payment due at the beginning of Year 3 is the same as a payment due at the end of Year 2.

*End-of-Year Discount Factor Calculation.* The discount factor formula for each end-of-year cash flow (payment/receipt) is written:

\[
DF = \frac{1}{(1 + i)^t}
\]

Where:
- DF = End-of-year discount factor
- i = Discount rate
- t = Number of years until the payment (receipt is due)

**For Example:** Determine the present value (PV) of a payment of $1,000 due at the end of 1 year using the nominal discount rate for three years or less, 5.6 percent.

Discount Factor Calculation:

\[
DF = \frac{1}{(1 + i)^t} = \frac{1}{(1 + 0.056)^1} = \frac{1}{1.056} = 0.9470
\]

Present Value Calculation:

\[
PV = DF \times CF = 0.9470 \times 1000 = 947
\]

(rounded to the nearest dollar)

*Sum Factors for Repetitive End-of-Year Cash Flows.* When there is a repetitive cash flow such as a lease payment, you can use a sum factor to speed the calculation process.

\[
PV = SF \times CF
\]

Where:
- PV = Present value
- SF = End-of-year sum factor
- CF = Cash flow

**For example:** Determine the present value of a series of three payments of $1,000 each due at the end of each of the next three years, when the discount rate is 5.6 percent.

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>Formula</th>
<th>Calculation</th>
<th>Discount Factor (DF)</th>
<th>Present Value (PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,000</td>
<td>1/(1.056)</td>
<td>1/1.0560</td>
<td>.9470\textsuperscript{a}</td>
<td>$ 947\textsuperscript{b}</td>
</tr>
<tr>
<td>2</td>
<td>1,000</td>
<td>1/(1.056)</td>
<td>1/1.1151</td>
<td>.8968</td>
<td>$ 897</td>
</tr>
</tbody>
</table>
The present value of a series of three $1,000 end-of-year payments is $2,693 when the discount rate is 5.6 percent. The sum of the three factors is 2.6930. Using the sum factor and the equation above:
\[
PV = SF(CF)
\]
\[
= 2.6930 \times ($1000)
\]
\[
= $2,693 \text{ present value (rounded to the nearest dollar)}
\]

**Note:** The answer calculated using the sum factor is the same as the answer calculated using individual discount factors. However, answers may vary slightly because of differences in rounding.

**End-Of-Year Discount Factors** Appendix B-2, OMB Circular A-94,
**Discount Rate Policy.** Section 8 - OMB Circular A-94

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### 9.4.2 - Discount Factors For Mid-Year Payment

**When to Use Mid-Year Discount Factors.** Use mid-year discount factors when a single payment will be made mid-year or payments will be made at regular intervals (e.g., monthly or quarterly) throughout the year.

**Mid-Year Discount Factor Calculation.** The discount factor formula for mid-year cash flow (payment/receipt) is written:

\[
MYDF = \frac{1}{(1 + i)^{(t-\frac{3}{2})}}
\]

Where:
- \( MYDF \) = Mid-year discount factor
- \( i \) = Discount rate
- \( t \) = Number of years until the payment (receipt) is due

**For example:** Determine the present value of a series of 12 monthly payments of $1,000 each due at the beginning of each month for 1 year. The total amount for the year is $12,000. These payments are spaced evenly over the year; hence the use of a MYDF would be appropriate.

**Discount Factor Calculation:**

\[
MYDF = \frac{1}{(1 + i)^{(t-\frac{3}{2})}}
\]

\[
= \frac{1}{(1.056)^{(1-\frac{3}{2})}}
\]

\[
= \frac{1}{1.056^{\frac{1}{2}}}
\]

\[
= \frac{1}{1.0276}
\]

\[
= .9731
\]

**Present Value Calculation:**

\[
PV = MYDF \times (CF)
\]

\[
= .9731 \times ($12,000)
\]

\[
= $11,677 \text{ (rounded to the nearest dollar)}
\]
**Sum Factors for Repetitive Mid-Year Cash Flows.** When there is a repetitive cash flow such as a lease payment, you can use sum factors to speed the calculation process.

PV = MYSF (CF)

Where:

- PV = Present value
- MYSF = Mid-year sum factor
- CF = Cash flow

**For example:** Determine the present value of a series of 36 monthly payments of $1,000 each due at the beginning of each month for the next three years; that is, $12,000 per year for three years. These payments are spaced evenly over the year; hence the use of a MYDF would be appropriate.

<table>
<thead>
<tr>
<th>Year</th>
<th>Payment</th>
<th>Formula</th>
<th>Calculation</th>
<th>Discount Factor (MYDF)</th>
<th>Present Value (PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$12,000</td>
<td>1/(1.056).5</td>
<td>1/1.0276</td>
<td>.9731a</td>
<td>$11,677b</td>
</tr>
<tr>
<td>2</td>
<td>$12,000</td>
<td>1/(1.056).5</td>
<td>1/1.0852</td>
<td>.9215</td>
<td>$11,058</td>
</tr>
<tr>
<td>3</td>
<td>$12,000</td>
<td>1/(1.056).5</td>
<td>1/1.1459</td>
<td>.8727</td>
<td>$10,472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>2.7673</td>
<td>$33,207</td>
</tr>
</tbody>
</table>

a Factors are rounded to the four decimal places.

b Amounts are rounded to the nearest dollar.

The present value of a series of three $12,000 mid-year payments is $33,207, when the discount rate is 5.6 percent. The sum of the three mid-year discount factors is 2.7673. Using the sum factor and the equation above:

PV = MYSF (CF)

= 2.7673 ($12,000)

= $33,208 present value (rounded to the nearest dollar).

**Note:** The answer calculated using the sum factor is slightly higher than the one calculated using individual discount factors, because of rounding differences.

**Mid-Year Discount Factors** Appendix B-2, OMB Circular A-94.

**Discount Rate Policy.** Section 8 - OMB Circular A-94.

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**9.5 - Calculating Net Present Value And Selecting The Best Alternative**

**Net Present Value Analysis.** Remember from the Chapter Introduction that you should use the following 5-step process in net present value analysis:

**Step 1.** Select the discount rate.

**Step 2.** Identify the costs/benefits to be considered in analysis.

**Step 3.** Establish the timing of the costs/benefits.

**Step 4.** Calculate net present value of each alternative.

**Step 5.** Select the offer with the best net present value.

This section will demonstrate the use of that 5-step process in two lease-purchase decision examples using nominal discount rates. You should follow the same steps for any net present value analysis whether you are using nominal discount rates or real discount rates.

**Lease-Purchase Decision Example 1.** Assume that you want to determine which of the following proposals will result in the lowest total cost of acquisition?

**Offeror A:** Proposes to lease the asset for 3 years. The annual lease payments are $10,000 per year. The first payment will be due at the beginning of the lease; the remaining two payments are due at the beginning of Years 2 and 3.

**Offeror B:** Proposes to sell the asset for $29,000. It has a 3-year useful life. Salvage value at the end of the 3-year period, will be $2,000.
Step 1. Select the discount rate. The term of the lease analysis is three years, so we will use the nominal discount rate for three years, 5.4 percent.

Steps 2 and 3. Identify and establish the timing of the costs/benefits to be considered in analysis. The expenditures and receipts associated with the two offers and their timing are delineated in the table below: (Parentheses indicate a cash outflow.)

| Offer-Related Expenditures/Receipts |
|---|---|---|
| t | Offer A | Offer B |
| 0 | $10,000 | $29,000 |
| 1 | $10,000 | - |
| 2 | $10,000 | - |
| 3 | - | ($2,000) |

Step 4. Calculate net present value. The tables below summarize the net present value calculations applied to each alternative.

| Net present value of Offer A |
|---|---|---|---|
| t | Cash Flow | DF | PV |
| 0 | $10,000 | 1.0000 | $10,000 |
| 1 | $10,000 | 0.9470 | $9,470 |
| 2 | $10,000 | 0.8968 | $8,968 |
| Net Present Value | | | $28,438 |

Note the following points in the net present value calculations above:

- Payments due now are not discounted.
- Payments due at the beginning of Years 2 and 3 are treated as if they are due at the end of Years 1 and 2.
- You could have calculated the net present value of Offer A using the Sum of Discount Factors (Appendix A-1) for the payments due at the beginning of Years 2 and 3. Remember that payments due now are not discounted and payments due at the beginning of Years 2 and 3 are treated as if they are due at the end of Years 1 and 2. The calculations would be:
  \[ NPV = -$10,000 + 1.8438(-$10,000) = -$10,000 - $18,438 = -$28,438 \]

| Net present value of Offer B |
|---|---|---|---|
| t | Cash Flow | DF | PV |
| 0 | $29,000 | 1.0000 | $29,000 |
| 3 | ($2,000) | 0.8492 | ($ 1,698) |
| Net Present Value | | | $27,302 |

Note the following points in the net present value calculations above:

- Offer B salvage value is treated as a cash inflow at the end of Year 3.
- Payments due now are not discounted.

Step 5. Select the offer with the best net present value. In this example, we would select Offer B, the
offer with the lowest net present value.

*Lease-Purchase Decision Example 2.* Assume that we want to determine which of the following proposals will result in the lowest acquisition cost?

**Offeror A**—Proposes to lease the asset for 3 years. The monthly lease payments are $1,500; that is, the total amount for each year is $18,000. These payments are spaced evenly over the year, so the use of a MYDF would be appropriate.

**Offeror B**—Proposes to sell the asset for $56,000. It has a 3-year useful life. At the end of the 3-year period it will have a $3,000 salvage value.

**Step 1. Select the discount rate.** The term of the analysis is three years, so we will use the nominal discount rate for three years, 5.6 percent.

**Steps 2 and 3. Identify and establish the timing of the costs/benefits to be considered in analysis.** The expenditures and receipts associated with the two offers and their timing are delineated in the table below:

<table>
<thead>
<tr>
<th>Offer Expenditures/Receipts</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

**Step 4. Calculate net present value.** The tables below summarize the net present value calculations applied to each alternative.

### Net present value of Offer A

<table>
<thead>
<tr>
<th>t</th>
<th>Cash Flow</th>
<th>DF</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$18,000</td>
<td>0.9731</td>
<td>$17,516</td>
</tr>
<tr>
<td>2</td>
<td>$18,000</td>
<td>0.9215</td>
<td>$16,587</td>
</tr>
<tr>
<td>3</td>
<td>$18,000</td>
<td>0.8727</td>
<td>$15,709</td>
</tr>
</tbody>
</table>

Net Present Value $49,812

**NOTE the following points in the net present value calculations above:**
- Offeror A payments are due monthly, so we used the nominal rate, mid-year factors from Appendix B-2.
- You could also calculate the net present value of Offer A using the Sum of Discount Factors in Appendix B. That calculation would produce a slightly different answer due to rounding differences.

### Net present value of Offer B

<table>
<thead>
<tr>
<th>t</th>
<th>Cash Flow</th>
<th>DF</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$56,000</td>
<td>1.0000</td>
<td>$56,000</td>
</tr>
<tr>
<td>3</td>
<td>($3,000)</td>
<td>0.8492</td>
<td>($2,548)</td>
</tr>
</tbody>
</table>

Net Present Value $53,452

**Note the following points in the net present value calculations above:**
- Offer B salvage value is treated as a cash inflow at the end of Year 3.
Payments due now are not discounted.

**Step 5. Select the offer with the best net present value.** In this example, we would select Offer A, the offer with the lowest net present value.

### 9.6 - Identifying Issues And Concerns

**Questions to Consider in Analysis.** As you perform price/cost analysis, consider the issues and concerns identified in this section, whenever you use net present value analysis.

- **Is net present value analysis used when appropriate?**
  Net present value analysis should be used in any analysis supporting Government decisions to initiate, renew, or expand programs or projects which would result in a series of measurable benefits or costs extending for three or more years into the future.

- **Are the dollar estimates for expenditures and receipts reasonable?**
  The base for all present value calculations is estimated future cash flows. The rationale for those estimates must be documented and supported just like any cost estimate. This includes estimates of costs that will be included in the contract or lease agreement and estimates of other cash flows that are not included. All may be used in present value calculations.

- **Are the times projected for expenditures and receipts reasonable?**
  Discount factors depend on the discount rate and the timing of the cash flow. The timing of any cash flow not documented in the contract or lease agreement must be clearly supported. The offeror is responsible for estimating and defending cash flow estimates included in the proposal. Government technical personnel have that responsibility for estimated costs related to item ownership.

- **Are the proper discount rates used in the net present value calculations?**
  Unless precluded by agency policy, discount rates should be taken from Appendix C of OMB Circular A-94. If they are not, the rationale must be documented.
  - The rate selected should be based on the number of time periods included in the analysis. If the period of the analysis does not match any of the discount rate periods delineated in OMB Circular A-94, linear interpolation should be used to estimate a rate for that period of time.
    - Nominal discount rates should be used for any analysis not based on constant year dollars. Real discount rates should be used for any analysis that is based on constant year dollars.

- **Are the proper discount factors used in analysis?**
  The discount factor should be calculated considering the timing of the cash flow.
  - End-of-year discount factors (Appendix B) should be used for cash flows at the beginning or end of the year.
  - Mid-year discount factors (Appendix B) should be used for cash flows in the middle of the year or regularly throughout the year (e.g., monthly or quarterly).

- **Are discount factors properly calculated from the discount rate?**
  End-of-year or mid-year discount rates should be calculated following the procedures delineated in Section 9.4, https://acc.dau.mil/CommunityBrowser.aspx?id=379496 - 9.4

- **Have all cash flows been considered?**
  Net present value analysis must consider all relevant cash flows throughout the decision life cycle.

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**Volume 3 – Cost Analysis**

1.0 Introduction

This chapter describes contract costs and cost analysis.

1.1 Defining Contract Costs

*Contract Costs.* Contract costs are monetary measures of the capital and labor required to complete a contract. Not all contract costs result from cash expenditures during the contract period. Accrual accounting provides for the matching of revenues and expenditures. Thus, some costs are recorded in the accounting records even though there has not been an actual cash expenditure. The total cost of a contract is the sum of the direct and indirect costs allocable to the contract, incurred or to be incurred, less any allocable credits, plus any applicable cost of money (FAR 31.201-1 (a)).

A direct contract cost is any cost that can be identified specifically with a final cost objective (e.g., a
Costs identified specifically with a particular contract are direct costs of the contract and are charged to that contract.

Costs must not be charged to a contract as direct costs if other costs incurred for the same purpose in like circumstances have been charged as indirect costs to that contract or any other contract (FAR 31.202 (a)).

All costs specifically identified with other contracts are direct costs for those contracts and shall not be charged to another contract directly or indirectly.

**For example:** The cost of 5,000 pounds of sheet metal used to fabricate covers for equipment built under a Government contract would be charged directly to that contract and no other contract.

**Indirect Cost (FAR 31.203).** An indirect cost is any cost NOT directly identified with a single final cost objective, but identified with two or more final cost objectives or an intermediate cost objective.

- After the contractor has charged all direct costs to contracts (or other final cost objectives), indirect costs are those remaining to be allocated to the various cost objectives (FAR 31.203 (a)).
- The distribution of indirect costs among various contracts should be based on the benefit accrued. If the contract did not benefit, it should not share the indirect cost (FAR 31.203 (c)).
- Costs must not be charged to a contract as indirect costs if other costs incurred for the same purpose in like circumstances have been charged as direct costs to that contract or any other contract (FAR 32.203 (b)).

**For example:** A contractor is simultaneously working on two contracts in the same rented building. The rent for that building should be allocated to those two contracts as an indirect cost. If one contract used 60 percent of the building, it should be allocated about 60 percent of the rent expense. Other contracts that do not benefit from the use of the building should not be allocated any rent expense for the building.

**Alternative Direct Cost Treatment (FAR 31.202(b)).** For reasons of practicality, any direct cost of minor dollar amount may be treated as an indirect cost if the accounting treatment:

- Is consistently applied to all final cost objectives, and
- Produces substantially the same results as treating the cost as a direct cost.

**For example:** The cost of inexpensive rivets used to fabricate equipment would be a direct cost. However, the cost of tracking each rivet to each unit of equipment could be more than the cost of the rivets themselves. It might be more practical to treat the cost of these rivets as an indirect cost and allocate that cost to all items that use those rivets. Remember this method may only be used if it is consistently applied to all cost objectives and produces substantially the same results as treating the rivet cost as a direct cost.

**Direct/Indirect Cost Decision (FAR 31.201, FAR 32.202, and FAR 31.203).** The decision to classify a cost as direct or indirect is not always a clear choice. There is no absolute list of costs that must be treated as direct costs or indirect costs. Contractors have the right and responsibility to define costs within their own accounting systems. At the same time, the Government prescribes guidelines for use by contractors in making their decisions and for use by you in reviewing the appropriateness of their decisions. Three sources of guidance are particularly important.

- Cost Accounting Standards (CAS) are issued by the Cost Accounting Standards Board (CASB). When these standards are applicable, they take priority over other forms of accounting guidance.

- The Federal Acquisition Regulation (FAR) provides both general and specific guidelines on accounting for costs.

- Generally Accepted Accounting Principles (GAAP) are general rules used by all business entities. They are non-regulatory guidance developed and used by Certified Public Accountants. However, they provide the general guidelines followed by all firms in accounting system development. They are required to be followed for Government contract costing when the CAS does not apply and/or is silent, and when the FAR is silent.

The role of Government representatives—be they auditors, analysts, or contracting officers—is not so much
directing or approving the direct/indirect cost decision as it is reviewing the adequacy and acceptability of contractor's accounting systems for use in Government contracting.

1.2 Identifying Key Cost Analysis Considerations

**Definition of Cost Analysis (FAR 15.404-1(c)(1))**. Cost analysis is:

- The review and evaluation of the separate cost elements and profit or fee in an offeror's or contractor's proposal (including cost or pricing data or information other than cost or pricing data), and
- The application of judgment to determine how well the proposed costs represent what the cost of the contract should be, assuming reasonable economy and efficiency.

**Required Cost Analysis (FAR 15.404-1(a)(3))**. You must use cost analysis to evaluate the reasonableness of cost elements when cost or pricing data are required.

**Optional Cost Analysis (FAR 15.404-1(a)(4))**. You may also use cost analysis to evaluate information other than cost or pricing data to determine cost reasonableness or cost realism.

**Cost Reasonableness (FAR 31.201-3)**. A cost is reasonable if, in its nature and amount, it does not exceed the cost which would be incurred by a prudent person in the conduct of competitive business.

**Cost Realism (FAR 15.404-1 (d)(1))**. To be realistic, the costs in an offeror's proposal must be:

- Realistic for the work to be performed under the contract;
- Reflect a clear understanding of contract requirements; and
- Consistent with the various elements of the offeror's technical proposal.

**Cost Analysis Supports Price Analysis (FAR 15.404-1(a)(3))**. Perform price analysis even when you perform cost analysis. Assuring the reasonableness of individual elements of cost does not always assure overall price reasonableness.

**For example**, suppose that you wanted to procure a custom-made automobile identical to a Pontiac Trans Am. At your request, your neighborhood mechanic agrees to build you such a car. In building the car, the mechanic gets competitive quotes on all the necessary parts and tooling, pays laborers only the minimum wage, and asks only a very small profit.

How do you think the final price will compare to a car off an assembly line? Probably at least ten times more expensive. Parts alone may be five times more expensive. The entire cost of tooling will be charged to one car. Labor, although cheaper per hour, will likely not be as efficient as assembly-line labor. Is the price reasonable? That decision can only be made using a thorough price analysis.

**Cost Analysis Techniques and Procedures (FAR 15.404-1(c)(2))**. As appropriate, use the following techniques and procedures to perform cost analysis:

- Evaluate cost elements, including:
  - The necessity for and reasonableness of proposed costs, including allowances for contingencies;
  - Projections of the offeror's cost trends, on the basis of current and historical cost or pricing data or information other than cost or pricing data;
  - Reasonableness of estimates generated by appropriately calibrated and validated parametric models or Cost Estimating Relationships; and
  - The application of audited or negotiated indirect cost rates, labor rates, cost of money factors, and other factors.

- Evaluate the effect of the offeror's current practices on future costs.
  - Ensure that the effects of inefficient or uneconomical past practices are not projected into the future.
  - In pricing production of recently developed complex equipment, perform a trend analysis of basic labor and materials even in periods of relative price stability.

- Compare costs proposed by the offeror for individual cost elements with:
Actual costs previously incurred by the offeror;
Previous cost estimates from the offeror or from other offerors for the same or similar items;
Other cost estimates received in response to the Government's request;
Independent Government cost estimates by technical personnel; and
Forecasts of planned expenditures.

Verify that the offeror's cost submissions are in accordance with the contract cost principles and procedures in FAR Part 31 and any applicable Cost Accounting Standards.

Determine whether any cost or pricing data necessary to make the contractor's proposal accurate, complete, and current have not been either submitted or identified in writing by the contractor. If there are such data:

Attempt to obtain the data and negotiate using the data obtained, or
Make satisfactory allowance for the incomplete data.

Analyze the results of any make-or-buy program reviews, in evaluating subcontract costs.

1.3 Defining The Cost Estimating And Cost Accounting Relationship


A contractor's cost estimating system is the policies, procedures, and practices for generating cost estimates and other data included in cost proposals submitted to customers in the expectation of receiving contract awards. It includes the contractor's:

Organizational structure;
Established lines of authority, duties, and responsibilities;
Internal controls and managerial reviews;
Flow of work, coordination, and communication; and
Estimating methods, techniques, accumulation of historical costs, and other analyses used to generate cost estimates.

An acceptable estimating system should provide for the use of appropriate source data, utilize sound estimating techniques and good judgment, maintain a consistent approach, and adhere to established policies and procedures (DFARS 215.407-5-70 (d)).

Audit Review of Cost Estimating System (FAR 15.407-5). When appropriate, the cognizant auditor will establish and manage regular programs for reviewing selected contractors’ estimating systems or methods, in order to:

Reduce the scope of reviews to be performed on individual proposals;
Expedite the negotiation process; and
Increase the reliability of proposals.

For each estimating system review, the auditor will:

Document review results in a survey report.
Send a copy of the survey report and a copy of the official notice of corrective action required to each contracting office and contract administration office having substantial business with that contractor.
Consider significant deficiencies not corrected by the contractor in subsequent proposal analyses and negotiations.

Characteristics of an Acceptable Estimating System (DFARS 215.407-5-70(d)). When evaluating the acceptability of a contractor's estimating system, consider whether it:
• Establishes clear responsibility for preparation, review and approval of cost estimates;
• Provides a written description of the organization and duties of the personnel responsible for preparing, reviewing, and approving cost estimates;
• Assures that relevant personnel have sufficient training, experience and guidance to perform estimating tasks in accordance with the contractor's established procedures;
• Identifies the sources of data and the estimating methods and rationale used in developing cost estimates;
• Provides for appropriate supervision throughout the estimating process;
• Provides for consistent application of estimating techniques;
• Provides for detection and timely correction of errors;
• Protects against cost duplication and omissions;
• Provides for the use of historical experience, including historical vendor pricing information, where appropriate;
• Requires use of appropriate analytical methods;
• Integrates information available from other management systems, where appropriate;
• Requires management review including verification that the company's estimating policies, procedures and practices comply with applicable regulations;
• Provides for internal review of and accountability for the adequacy of the estimating system, including the comparison of projected results to actual results and an analysis of any differences;
• Provides procedures to update cost estimates in a timely manner throughout the negotiation process; and
• Addresses responsibility for review and analysis of the reasonableness of subcontract prices.

Indicators of Potentially Significant Estimating System Deficiencies (DFARS 215.407-5-70(d)). Be on the lookout for conditions that may produce or lead to significant estimating deficiencies. This includes:
• Failure to ensure that historical experience is available to and utilized by cost estimators, where appropriate;
• Continuing failure to analyze material costs or failure to perform subcontractor cost reviews as required;
• Consistent absence of analytical support for significant proposed cost amounts;
• Excessive reliance on individual personal judgment where historical experience or commonly utilized standards are available;
• Recurring significant defective pricing findings within the same cost element(s);
• Failure to integrate relevant parts of other management systems (e.g., production control or cost accounting) with the estimating system so that the ability to generate reliable cost estimates is impaired; and
• Failure to provide established policies, procedures, and practices to persons responsible for preparing and supporting estimates.

Cost Accounting System (DCAM 9.302a). An effective cost estimating system integrates applicable information from a variety of company management systems. The accounting system is not the only source of such information, but it is the primary source. A firm's accounting system consists of the methods and records established to identify, assemble, analyze, classify, record, and report the firm's transactions and to maintain accountability for the related assets and liabilities. The accounting system should be well-designed to provide reliable accounting data
and prevent mistakes that would otherwise occur. An inadequate cost accounting system can provide data that are not current, accurate, and complete data in support of an offeror's proposal. The defective cost data can create inaccurate estimates no matter how well the estimating uses the data provided. **Characteristics of an Adequate Accounting System** *(DCAM 9.302b)*. To provide the data required for cost estimating purposes, a firm's cost accounting system must contain sufficient refinements to provide (where applicable) cost segregation for:

- Preproduction work and special tooling;
- Prototypes, static test models, or mockups;
- Production by individual production centers, departments, or operations-as well as by components, lots, batches, runs or time periods;
- Engineering by major task;
- Each contract item to be separately priced;
- Scrap, rework, spoilage, excess material, and obsolete items resulting from engineering changes;
- Packaging and crating when substantial; and
- Other nonrecurring or other direct cost items requiring separate treatment.

**Two Common Cost Accounting Systems.** There are two commonly-used systems for cost accounting, job-order and process. Either system can provide adequate results, when it is properly maintained by the firm. However, system differences will affect the presentation of available information.

**Job-Order Cost System.** Under a job-order cost system the firm accounts for output by specifically identifiable physical units. The costs for each job or contract normally are accumulated under separate job orders.

- When a contract is for a limited number of units that are neither very complex nor costly, the costs of all units may be accumulated under one job order without any further breakdown.
- When the contract is for items that are both complex and costly, the total quantity may be broken down into smaller production lots. The job order for the total contract may be supported by a separate job order for each lot.
  - The use of lots permits the contractor to establish better control over the work, and the historical cost data from a series of lots lend themselves to a projection of estimated costs for future production.
  - Experience with the product normally determines the number of units for which costs are to be accumulated.

**Process Cost Systems.** Under a process cost system, direct costs are charged to a process even though end-items (which may not be identical) for more than one contract are being run through the process at the same time. At the end of the accounting period, the costs incurred for that process are assigned to the units completed during the period and to the incomplete units still in process.
Process cost systems are typically used by firms that continuously manufacture a particular end-item, like automobiles or chemicals which require identical or highly similar production processes. A process is one part of a complete set of activities that an item must pass through during manufacture.

- The completed item results from a series of processes, each of which produces some changes in the item.
- The number of processes involved will vary with the complexity of the item.
- The greater the similarity between two end-items, the more likely they are to go through the same process, during the same period of time, with factory laborers devoting a part of their time to each item.

A number of different methods may be used to assign costs to end-items.

- If all items being processed are identical, the contractor may add the costs incurred during the accounting period to the cost of the beginning work-in-process inventory and subtract the estimated cost of the ending work-in-process inventory to arrive at the total costs of items completed. Unit cost is determined by dividing the total cost by the number of units completed.
- If all items being processed are not identical, the contractor may use standard costs and, at the end of the accounting period, multiply the standard cost for each item by the number of units completed to arrive at a total cost. Variance from standard can be accounted for and assigned to end-items in a number of different ways.

Normally an item will go through more than one process. When an item comes out of one process and enters another, its cost from the process just completed will be charged to the next process, usually as material cost. This continues until the completed end-item emerges from its last process.

A process cost system identifies which factory employees charged their time to which processes, what their rates of pay were, and the total cost charged to the process.

- Unlike a job-order cost system, you cannot determine the actual labor cost for specific end-items that have gone through a process, because cost elements lose their identity when they are charged to the next process as material costs.
- You can generally add standard cost and a factor for variances and arrive at an acceptably close approximation of actual labor cost.

1.4 Describing Cost Estimating Methods

Principles For Method Selection (FAR 31.201-1 and DCAM 9-303b). An offeror may use any generally accepted estimating method that is equitable and consistently applied.

<table>
<thead>
<tr>
<th>An estimating method is...</th>
<th>When...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equitable</td>
<td>It produces fair and reasonable results for all contracts and all customers of the firm. No individual or group of contracts or customers benefits at the expense of others.</td>
</tr>
</tbody>
</table>
| Consistently applied      | It is applied in similar estimating situations for all contracts and all customers of the firm. However, different estimating methods may be applied in different estimating situations. Differences may be related to such factors as:  
  ● The relative dollar value of the estimate;  
  ● The firm’s competitive position; |
Basic Cost Estimating Methods (DCAM 9-303d). There are a variety of techniques that can be used to estimate contract cost. Some estimating texts identify ten or more. However, the most common classification identifies three methods: round-table, comparison, and detailed.

<table>
<thead>
<tr>
<th>Estimating Method</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round-Table</td>
<td>Experts are brought together to develop cost estimates, by exchanging views and making judgments based on knowledge and experience. Most commonly used when there is little or no cost experience or detailed product information (e.g., specifications, drawings, or bills of material).</td>
</tr>
<tr>
<td>Comparison</td>
<td>Under this method, costs for a new item are estimated using comparisons with the cost of completing similar tasks under past or current contracts. Any differences are isolated and cost elements applicable to the differences are deleted from or added to experienced costs. Comparisons may be made at the cost element level or total price level. Adjustments may also be made for possible upward or downward cost trends. Most commonly used when specifications for the item being estimated are similar to other items already produced or currently in production and for which actual cost experience is available.</td>
</tr>
<tr>
<td>Detailed</td>
<td>This method is characterized by a thorough review of all components, processes, and assemblies. It requires detailed information to arrive at estimated costs and typically uses cost data derived from the accounting system, adjunct statistical records, and other sources. Most commonly used when the required information is available and future production potential warrants the cost of the detailed analysis required. It is the most accurate of the three methods for estimating direct cost. It is also the most time consuming and expensive.</td>
</tr>
</tbody>
</table>

Estimating Method Comparison (DCAM 9-303d). The following table compares the three methods of cost estimating:

<table>
<thead>
<tr>
<th>Estimating Method</th>
<th>Round Table</th>
<th>Comparison*</th>
<th>Detailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Accuracy</td>
<td>Low -- because limited data are used</td>
<td>Moderate/High -- depending on data, technique, and estimator</td>
<td>High -- based on engineering principles</td>
</tr>
<tr>
<td>Relative Estimator Consistency</td>
<td>Low -- different experts make different judgments</td>
<td>Moderate/High -- depending on data, technique, and estimator</td>
<td>High -- based on uniform principle application</td>
</tr>
<tr>
<td>Relative Development</td>
<td>Fast -- little detailed</td>
<td>Moderately Fast</td>
<td>Slow -- requires</td>
</tr>
</tbody>
</table>
Speed analysis required especially with repetitive use detailed design and analysis.

<table>
<thead>
<tr>
<th>Relative Estimate Development Cost</th>
<th>Low -- fast development and limited data requirements allow low development cost</th>
<th>Moderate -- depending on the need for data collection and analysis</th>
<th>High -- detailed work design and analysis require time and increase cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Data Requirements</td>
<td>Low -- based on expert judgment</td>
<td>Moderate -- only requires historical data</td>
<td>High -- requires detailed work design and analysis</td>
</tr>
</tbody>
</table>

Warning: This estimating method can project continuation of nonrecurring costs and cost inefficiencies experienced in past work.

Combination Estimates. There is no one estimating method that is best in all situations. In fact, most cost proposals will include different estimates made using different methods. All three methods may be used in the same proposal. Different methods may even be used as a cross-check in estimating a single cost element.

For example: For a unique research and development contract, an offeror may use round-table estimates for many cost elements because similar research has never been conducted before. However, the offeror may also use comparison estimates for other cost elements based on the costs incurred under other research and development contracts.

Estimating Methods for Cost Analysis. Whenever you perform a cost analysis, you should always consider the strengths and weaknesses of the estimating method used by the offeror in preparing the proposal. Remember, that when you are preparing your negotiation objective, you are not limited to using the method used by the offeror in developing proposal. You can use any method that appears appropriate under the circumstances.

<table>
<thead>
<tr>
<th>Estimating Method</th>
<th>Key Strengths and Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round-Table</td>
<td><strong>Strength:</strong> Can be used with limited data.  &lt;br&gt;<strong>Weakness:</strong> Lack of data increases variability between estimators and true costs.</td>
</tr>
<tr>
<td>Comparison</td>
<td><strong>Strength:</strong> Rapid development of estimates based on historical costs.  &lt;br&gt;<strong>Weakness:</strong> Estimates based on historical costs can project historical inefficiencies.</td>
</tr>
<tr>
<td>Detailed</td>
<td><strong>Strength:</strong> Most accurate estimates.  &lt;br&gt;<strong>Weakness:</strong> Requires complete information that may be expensive or impossible to obtain.</td>
</tr>
</tbody>
</table>

2.0 Chapter Introduction

2.1 Recognizing The Need For Cost Or Pricing Data

2.2 Obtaining Cost Or Pricing Data

2.3 Assuring Proper Cost Or Pricing Data Certification

- 2.3.1 Obtaining A Properly Executed Certificate
- 2.3.2 Identifying The Consequences of Certifying Defective Data

2.4 Recognizing The Need For Information Other Than Cost Or Pricing Data

2.0 Chapter Introduction

Solicitation Cost Information Requirements (FAR 15.403-5 and FAR 15.408(l)). When cost analysis is necessary to support a decision on price reasonableness or cost realism, the contracting officer may
require an offeror to submit cost information at any time prior to the close of negotiations. However, identifying all requirements in the solicitation will permit offerors to gather and document the required information during proposal preparation. If you require the data after proposals are received, the contracting process must be delayed while the offeror gathers and documents the information required. The solicitation must specify:

- Whether cost or pricing data are required;
- That, when cost or pricing data are required, the offeror may submit a request for exception from the requirement to submit cost or pricing data;
- Whether information other than cost or pricing data is required, if cost or pricing data are not necessary;
- Necessary preaward or post award access to the offeror's records;
- The format required for submission of cost or pricing data or information other than cost or pricing data (the FAR Table 15-2 format, a specified alternate format, or a format selected by the offeror).

**Information Other than Cost or Pricing Data** (FAR 2.101, FAR 15.402 and FAR 15.406-2). Information other than cost or pricing data:

- Is any type of information required to determine price reasonableness or cost realism that does not require offeror certification as accurate, complete, and current in accordance with FAR 15.406-2.
- May include pricing, sales, or cost information.
- Includes cost or pricing data for which certification is determined inapplicable after submission.

**Cost or Pricing Data** (FAR 2.101, FAR 15.403 and FAR 15.406-2). Cost or pricing data means:

- All facts that, as of the date of price agreement or, if applicable, an earlier date agreed upon between the parties that is as close as practicable to the date of agreement on price, prudent buyers and sellers would reasonably expect to affect price negotiations significantly.
- Require certification as accurate, complete, and current in accordance with FAR 15.406-2.
- Are factual, not judgmental, and are verifiable.
- Include the data that form the basis for the prospective offeror's judgment about future cost projections. The data do not indicate the accuracy of the prospective contractor's judgment.
- Are more than historical accounting data; they are all the facts that can be reasonably expected to contribute to the soundness of estimates of future costs and to the validity of determinations of costs already incurred.
- Include such factors as:
  - Vendor quotations;
  - Nonrecurring costs;
  - Information on changes in production methods and in production or purchasing volume;
  - Data supporting projections of business prospects and objectives and related operations costs;
  - Unit-cost trends such as those associated with labor efficiency;
  - Make-or-buy decisions;
  - Estimated resources to attain business goals; and
  - Information on management decisions that could have a significant bearing on costs.

**Price-Related Information Requirements After Receipt of Offers** (FAR 15.403-4(c) and FAR 15.404-2(d)). Decisions on offeror cost information requirements continue after proposals are received:
If offerors were required to submit cost or pricing data and:

- An offeror submitted the data, but the contracting officer later finds that certification is not required, treat the data as information other than cost or pricing data.
- An offeror initially refuses to provide the required data or the data provided are so deficient as to preclude adequate analysis and evaluation, the contracting officer must again attempt to obtain the data unless the data are no longer required. If the offeror persists in refusing to provide the needed data, the contracting officer must withhold contract award or price adjustment and refer the contract action to higher authority, with details of the attempts made to resolve the matter and a statement on the practicality of obtaining the supplies or services from another source.

If the Government does not require submission of cost or pricing data and the contracting officer later determines that the data are necessary, require the offeror to submit the required data prior to the close of contract negotiations.

If the Government does not require submission of cost or pricing data or information other than cost or pricing data, but the contracting officer later determines that information other than cost or pricing data is needed from the offeror to determine price reasonableness, require the offeror to submit the necessary information prior to the close of contract negotiations.

### 2.1 Recognizing The Need For Cost Or Pricing Data

**Requiring Cost or Pricing Data (FAR 15.403-4(a)(1)).** Unless an exception applies, the Truth in Negotiations Act (TINA) (10 U.S.C. 2306a and 41 U.S.C. 254b), as amended, requires the contracting officer to obtain cost or pricing data before accomplishing any of the following actions when the price is expected to exceed the applicable cost or pricing data threshold:

- The award of any negotiated contract (except for undefinitized actions such as letter contracts).
- The award of a subcontract at any tier, if the contractor and each higher-tier subcontractor have been required to furnish cost or pricing data.
- The modification of any sealed bid or negotiated contract (whether or not cost or pricing data were initially required) or subcontract. When calculating the amount of the contract price adjustment, consider both increases and decreases. (For example, a $200,000 modification resulting from a reduction of $500,000 and an increase of $300,000 is a pricing adjustment exceeding the current cost or pricing data threshold of $650,000.) This requirement does not apply when unrelated and separately priced changes for which cost or pricing data would not otherwise be required are included for administrative convenience in the same contract modification.

**Exceptions to TINA Cost or Pricing Data Requirements (FAR 15.403-1).** The same laws that establish requirements for cost or pricing data also provide for mandatory exceptions. **Never** require cost or pricing data when an exception applies.

<table>
<thead>
<tr>
<th>Except from TINA requirements if...</th>
<th>Standard for Granting the Exception</th>
</tr>
</thead>
</table>
| The contracting officer determines that the agreed-upon price is based on adequate price competition. | **A price is based on adequate price competition when one of the following situations exists:**

- Two or more responsible offerors, competing independently, submit priced offers that satisfy the Government's expressed requirement and both of the following requirements are met:
  - Award will be made to the offeror whose proposal represents the best value where price is a substantial factor in the source selection; and
  - There is no finding that the price of the otherwise successful offeror is unreasonable. Any finding that the |
<table>
<thead>
<tr>
<th>The contracting officer determines that the item price is set by law or regulation.</th>
<th>Pronouncements in the form of periodic rulings, reviews, or similar actions of a governmental body, or embodied in the laws, are sufficient to demonstrate a set price.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The contracting officer determines that you are acquiring a commercial item.</td>
<td>A new contract or subcontract must be for an item that meets the FAR commercial-item definition. A contract or subcontract modification of a commercial-item contract must not change the item from a commercial item to a noncommercial item.</td>
</tr>
<tr>
<td>The head of the contracting activity waives the requirement.</td>
<td>The head of the contracting activity (HCA) (without power of delegation) waives the requirement in writing. The HCA may consider waiving the requirement if the price can be determined to be fair and reasonable without submission of cost or pricing data. Note: Consider the contractor or higher-tier subcontractor to whom the waiver relates to have been required to provide cost or pricing data. Consequently, award of any lower-tier subcontract expected to exceed the cost or pricing data threshold requires the submission of cost or pricing data unless an exception otherwise applies to the subcontract.</td>
</tr>
</tbody>
</table>

Other Prohibitions Against Requiring Cost of Pricing Data (FAR 15.403-1(a) and FAR 15.403-2).
Never require cost or pricing data for:

- Any contract or subcontract action with a price that is equal to or less than the simplified acquisition threshold. When calculating the price adjustment related to a contract modification, consider both increases and decreases, unless unrelated and separately priced changes for which cost or pricing data would not otherwise be required are included for administrative convenience in the same contract modification.

- The exercise of a contract option at the price established at contract award or initial negotiation.

- Proposals used solely for overrun funding or interim billing price adjustments.

Cost or Pricing Data Requirements Authorized by the Head of the Contracting Activity (FAR 15.403-4(a)(2)).

If none of the exceptions or prohibitions described above apply, the head of the contracting activity (without power of delegation) may authorize the contracting officer to require cost or pricing data for any contract action at or below the cost or pricing data threshold.

- The head of the contracting activity must justify the requirement.

- Documentation must include a written finding that cost or pricing data are necessary to determine whether the price is fair and reasonable and the facts supporting that finding.

Before requesting authorization to require cost or pricing data below the cost or pricing data threshold, consider both the costs and benefits of requiring cost or pricing data. Give special consideration to requesting authorization to require cost or pricing data when the offeror, contractor, or subcontractor:

- Has been the subject of recent or recurring and significant findings of defective pricing;

- Currently has significant deficiencies in cost estimating systems; or

- Has recently been indicted for, convicted of, or the subject of an administrative or judicial finding of fraud regarding its cost estimating system or cost accounting practices.

2.2 Obtaining Cost Or Pricing Data

Cost or Pricing Data Format (FAR 15.403-5(b)(1), FAR 15.408(l), FAR 15.408(m), and FAR 49.6). Require cost or pricing data submission in the format prescribed in the solicitation/contract.

- For a contract termination settlement proposal submitted on a form specified in FAR 49.6, cost or pricing data must be submitted in the format prescribed by the form.

- For all other contract or subcontract actions the contracting officer may require submission of cost or pricing data in:
  - The format outlined in FAR Table 15-2;
  - An alternate format outlined in the solicitation/contract; or
  - A format selected by the offeror.

- FAR Table 15-2 (presented below) outlines the type of data that you should require.

FAR Table 15-2, Instructions for Submitting Cost/Price Proposals When Cost or Pricing Data Are Required

This document provides instructions for preparing a contract pricing proposal when cost or pricing data are required.

Note 1. There is a clear distinction between submitting cost or pricing data and merely making available books, records, and other documents without identification. The requirement for submission of cost or pricing data is met when all accurate cost or pricing data reasonably available to the offeror have been submitted, either actually or by specific identification, to the contracting officer or an authorized representative. As later information comes into your possession, it should be submitted promptly to the contracting officer in a manner that clearly shows how the information relates to the offeror's price proposal. The requirement for submission of cost or pricing data continues up to the time of agreement on price, or an earlier date agreed upon between the parties if applicable.

Note 2. By submitting your proposal, you grant the contracting officer or an authorized representative the right to examine records that formed the basis for the pricing proposal. That examination can take place
at any time before award. It may include those books, records, documents, and other types of factual
information (regardless of form or whether the information is specifically referenced or included in the
proposal as the basis for pricing) that will permit an adequate evaluation of the proposed price.

I. General Instructions
A. You must provide the following information on the first page of your pricing proposal:
(1) Solicitation, contract, and/or modification number;
(2) Name and address of offeror;
(3) Name and telephone number of point of contact;
(4) Name of contract administration office (if available);
(5) Type of contract action (that is, new contract, change order, price revision/redetermination, letter
contract, unpriced order, or other);
(6) Proposed cost; profit or fee; and total;
(7) Whether you will require the use of Government property in the performance of the contract, and, if so,
what property;
(8) Whether your organization is subject to cost accounting standards; whether your organization has
submitted a CASB Disclosure Statement, and if it has been determined adequate; whether you have
been notified that you are or may be in noncompliance with your Disclosure Statement or CAS, and, if
yes, an explanation; whether any aspect of this proposal is inconsistent with your disclosed practices or
applicable CAS, and, if so, an explanation; and whether the proposal is consistent with your established
estimating and accounting principles and procedures and FAR Part 31, Cost Principles, and, if not, an
explanation;
(9) The following statement:
This proposal reflects our estimates and/or actual costs as of this date and conforms with the instructions
in FAR 15.403-5(b)(1) and Table 15-2. By submitting this proposal, we grant the contracting officer and
authorized representative(s) the right to examine, at any time before award, those records, which include
books, documents, accounting procedures and practices, and other data, regardless of type and form or
whether such supporting information is specifically referenced or included in the proposal as the basis for
pricing, that will permit an adequate evaluation of the proposed price.
(10) Date of submission; and
(11) Name, title and signature of authorized representative.
B. In submitting your proposal, you must include an index, appropriately referenced, of all the cost or
pricing data and information accompanying or identified in the proposal. In addition, you must annotate
any future additions and/or revisions, up to the date of agreement on price, or an earlier date agreed upon
by the parties, on a supplemental index.
C. As part of the specific information required, you must submit, with your proposal, cost or pricing data
(that is, data that are verifiable and factual and otherwise as defined at FAR 2.101). You must clearly
identify on your cover sheet that cost or pricing data are included as part of the proposal. In addition, you
must submit with your proposal any information reasonably required to explain your estimating process,
including--
(a) The judgmental factors applied and the mathematical or other methods used in the estimate, including
those used in projecting from known data; and
(b) The nature and amount of any contingencies included in the proposed price.
D. You must show the relationship between contract line item prices and the total contract price. You
must attach cost-element breakdowns for each proposed line item, using the appropriate format
prescribed in the "Formats for Submission of Line Item Summaries" section of this table. You must furnish
supporting breakdowns for each cost element, consistent with your cost accounting system.
E. When more than one contract line item is proposed, you must also provide summary total amounts
covering all line items for each element of cost.
F. Whenever you have incurred costs for work performed before submission of a proposal, you must
identify those costs in your cost/price proposal.
G. If you have reached an agreement with Government representatives on use of forward pricing
rates/factors, identify the agreement, include a copy, and describe its nature.
H. As soon as practicable after final agreement on price or an earlier date agreed to by the parties, but
before the award resulting from the proposal, you must, under the conditions stated in FAR 15.406-2,
submit a Certificate of Current Cost or Pricing Data.

II. Cost Elements
Depending on your system, you must provide breakdowns for the following basic cost elements, as applicable:

A. **Materials and services.** Provide a consolidated priced summary of individual material quantities included in the various tasks, orders, or contract line items being proposed and the basis for pricing (vendor quotes, invoice prices, etc.). Include raw materials, parts, components, assemblies, and services to be produced or performed by others. For all items proposed, identify the item and show the source, quantity, and price. Conduct price analyses of all subcontractor proposals. Conduct cost analyses for all subcontracts when cost or pricing data are submitted by the subcontractor. Include these analyses as part of your own cost or pricing data submissions for subcontracts expected to exceed the appropriate threshold in FAR 15.403-4. Submit the subcontractor cost or pricing data as part of your own cost or pricing data as required in paragraph IIA(2) of this table. These requirements also apply to all subcontractors if required to submit cost or pricing data.

1. **Adequate Price Competition.** Provide data showing the degree of competition and the basis for establishing the source and reasonableness of price for those acquisitions (such as subcontracts, purchase orders, material order, etc.) exceeding, or expected to exceed, the appropriate threshold set forth at FAR 15.403-4 priced on the basis of adequate price competition. For interorganizational transfers priced at other than the cost of comparable competitive commercial work of the division, subsidiary, or affiliate of the contractor, explain the pricing method (see FAR 31.205-26(e)).

2. **All Other.** Obtain cost or pricing data from prospective sources for those acquisitions (such as subcontracts, purchase orders, material order, etc.) exceeding the threshold set forth in FAR 15.403-4 and not otherwise exempt, in accordance with FAR 15.403-1(b) (i.e., adequate price competition, commercial items, prices set by law or regulation or waiver). Also provide data showing the basis for establishing source and reasonableness of price. In addition, provide a summary of your cost analysis and a copy of cost or pricing data submitted by the prospective source in support of each subcontract, or purchase order that is the lower of either $10,000,000 or more, or both more than the pertinent cost or pricing data threshold and more than 10 percent of the prime contractor's proposed price. The contracting officer may require you to submit cost or pricing data in support of proposals in lower amounts.

Subcontractor cost or pricing data must be accurate, complete and current as of the date of final price agreement, or an earlier date agreed upon by the parties, given on the prime contractor's Certificate of Current Cost or Pricing Data. The prime contractor is responsible for updating a prospective subcontractor's data. For standard commercial items fabricated by the offeror that are generally stocked in inventory, provide a separate cost breakdown, if priced based on cost. For interorganizational transfers priced at cost, provide a separate breakdown of cost elements. Analyze the cost or pricing data and submit the results of your analysis of the prospective source’s proposal. When submission of a prospective source's cost or pricing data is required as described in this paragraph, it must be included along with your own cost or pricing data submission, as part of your own cost or pricing data. You must also submit any other cost or pricing data obtained from a subcontractor, either actually or by specific identification, along with the results of any analysis performed on that data.

B. **Direct Labor.** Provide a time-phased (e.g., monthly, quarterly, etc.) breakdown of labor hours, rates, and cost by appropriate category, and furnish bases for estimates.

C. **Indirect Costs.** Indicate how you have computed and applied your indirect costs, including cost breakdowns. Show trends and budgetary data to provide a basis for evaluating the reasonableness of proposed rates. Indicate the rates used and provide an appropriate explanation.

D. **Other Costs.** List all other costs not otherwise included in the categories described above (e.g., special tooling, travel, computer and consultant services, preservation, packaging and packing, spoilage and rework, and Federal excise tax on finished articles) and provide bases for pricing.

E. **Royalties.** If royalties exceed $1,500, you must provide the following information on a separate page for each separate royalty or license fee:

1. Name and address of licensor.
2. Date of license agreement.
4. Patent application serial numbers, or other basis on which the royalty is payable.
5. Brief description (including any part or model numbers of each contract item or component on which the royalty is payable).
6. Percentage or dollar rate of royalty per unit.
7. Unit price of contract item.
(8) Number of units.
(9) Total dollar amount of royalties.
(10) If specifically requested by the contracting officer, a copy of the current license agreement and identification of applicable claims of specific patents (see FAR 27.204 and FAR 31.205-37).

F. Facilities Capital Cost of Money. When you elect to claim facilities capital cost of money as an allowable cost, you must submit Form CASB-CMF and show the calculation of the proposed amount (see FAR 31.205-10). For a .pdf copy of Form CASB-CMF and instructions on how to calculate the cost of money factors, please see Appendix A to 9904.414 at http://farsite.hill.af.mil/vffara.htm.

III. Formats for Submission of Line Item Summaries

A. New Contracts (including letter contracts).

<table>
<thead>
<tr>
<th>Cost Elements (1)</th>
<th>Proposed Contract Estimate-Total Cost (2)</th>
<th>Proposed Contract Estimate-Unit Cost (3)</th>
<th>Reference (4)</th>
</tr>
</thead>
</table>

Column Instruction

(1) Enter appropriate cost elements.

(2) Enter those necessary and reasonable costs that, in your judgment, will properly be incurred in efficient contract performance. When any of the costs in this column have already been incurred (e.g., under a letter contract), describe them on an attached supporting page. When preproduction or startup costs are significant, or when specifically requested to do so by the contracting officer, provide a full identification and explanation of them.

(3) Optional, unless required by the contracting officer.

(4) Identify the attachment in which the information supporting the specific cost element may be found.

(Attach separate pages as necessary.)

B. Change Orders, Modifications, and Claims.

|-------------------|--------------------------------------|------------------------------------------|--------------------------|----------------------|----------------------|---------------|

Column Instructions

(1) Enter appropriate cost elements.

(2) Include the current estimates of what the cost would have been to complete the deleted work not yet performed (not the original proposal estimates), and the cost of deleted work already performed.

(3) Include the incurred cost of deleted work already performed, using actuals incurred if possible, or, if actuals are not available, estimates from your accounting records. Attach a detailed inventory of work, materials, parts, components, and hardware already purchased, manufactured, or performed and deleted by the change, indicating the cost and proposed disposition of each line item. Also, if you desire to retain these items or any portion of them, indicate the amount offered for them.

(4) Enter the net cost to be deleted which is the estimated cost of all deleted work less the cost of deleted work already performed. Column (2) minus Column (3) equals Column (4).

(5) Enter your estimate for cost of work added by the change. When nonrecurring costs are significant, or when specifically requested to do so by the contracting officer, provide a full identification and explanation of them. When any of the costs in this
column have already been incurred, describe them on an attached supporting schedule.

(6) Enter the net cost of change which is the cost of work added, less the net cost to be deleted. When this result is negative, place the amount in parentheses. Column (4) less Column (5) = Column (6).

(7) Identify the attachment in which the information supporting the specific cost element may be found.

C. Price Revision/Redetermination.

<table>
<thead>
<tr>
<th>Cutoff Date (1)</th>
<th>Number of Units Completed (2)</th>
<th>Number of Units to be Completed (3)</th>
<th>Contract Amount (4)</th>
<th>Redetermination Proposal Amount (5)</th>
<th>Difference (6)</th>
</tr>
</thead>
</table>

Column Instruction

(1) Enter the cut off date required by the contract, if applicable.

(2) Enter the number of units completed during the period for which experienced costs of production are being submitted.

(3) Enter the number of units remaining to be completed under the contract.

(4) Enter the cumulative contract amount.

(5) Enter your redetermination proposal amount.

(6) Enter the difference between the contract amount and the redetermination proposal amount. When this result is negative, place the amount in parentheses. Column (4) minus Column (5) equals Column (6).

(7) Enter appropriate cost elements. When residual inventory exists, the final costs established under fixed-price-incentive and fixed-price-redeterminable arrangements should be net of the fair market value of such inventory. In support of subcontract costs, submit a listing of all subcontracts subject to repricing action, annotated as to their status.

(8) Enter all costs incurred under the contract before starting production and other nonrecurring costs (usually referred to as startup costs) from your books and records as of the cutoff date. These include such costs as preproduction engineering, special plant rearrangement, training program, and any identifiable nonrecurring costs such as initial rework, spoilage, pilot runs, etc. In the event the amounts are not segregated in or otherwise available from your records, enter in this column your best estimates. Explain the basis for each estimate and how the costs are charged on offeror's accounting records (e.g., included in production costs as direct engineering labor, charged to manufacturing overhead). Also show
how the costs would be allocated to the units at their various stages of contract completion.

(9) Enter in Column (9) the production costs from your books and records (exclusive of preproduction costs reported in Column (8)) of the units completed as of the cutoff date.

(10) Enter in Column (10) the costs of work in process as determined from your records or inventories at the cutoff date. When the amounts for work in process are not available in your records but reliable estimates for them can be made, enter the estimated amounts in Column (10) and enter in Column (9) the differences between the total incurred costs (exclusive of preproduction costs) as of the cutoff date and these estimates. Explain the basis for the estimates, including identification of any provision for experienced or anticipated allowances, such as shrinkage, rework, design changes, etc. Furnish experienced unit or lot costs (or labor hours) from inception of contract to the cutoff date, improvement curves, and any other available production cost history pertaining to the item(s) to which your proposal relates.

(11) Enter total incurred costs (Total of Columns (8), (9), and (10)).

(12) Enter those necessary and reasonable costs that in your judgment will properly be incurred in completing the remaining work to be performed under the contract with respect to the item(s) to which your proposal relates.

(13) Enter total estimated cost (Total of Columns (11) and (12)).

(14) Identify the attachment in which the information supporting the specific cost element may be found.

(Attach separate pages as necessary.)

Local Data Requirements (FAR 15.401, FAR 15.403-5(b)(1), FAR 15.408(l)(1), and FAR 15.408(m)(1)).

Many contracting activities establish specific format and data requirements tailored to the products typically acquired by the activity. In addition to FAR and local requirements, the contracting officer may establish format and data requirements for a specific contract. Be careful. You must obtain the data required for cost analysis, but collection, formatting, manipulation, and analysis of unnecessary data can unreasonably increase contract costs. Offerors may refuse to submit data that they feel are not what "prudent buyers and sellers would reasonably expect to affect price negotiations significantly." Litigation may be required to obtain such data and the results of such litigation are not guaranteed.

Paper or Electronic Data Submission (FAR 15.403-5(b)(1), FAR 15.408(l)(3), and FAR 15.408(m)(3)).

Traditionally contracting officers have required offerors to submit cost or pricing data as printed documents. Most firms prepare these documents using company computers and the resulting printouts may be several inches or even several feet thick. When the contracting officer gets the paper proposal, the data usually must be entered into a Government computer for analysis. Data entry may require hours, days, or even weeks. This is an unnecessary waste of Government manpower and computer resources, because the offeror has the data in electronic files. Many activities are eliminating this wasted effort by requiring electronic data submission. Data submitted electronically are ready for immediate analysis and the cost of data entry is eliminated.

You may require an offeror to submit data on a computer diskette or you may require electronic transmission (computer to computer) by Electronic Data Interchange (EDI). Whatever method you choose, make sure that the requirement does not place an unreasonable hardship on the offeror.

2.3 Assuring Proper Cost Or Pricing Data Certification

This section will present information on the cost pricing data certification requirements and the consequences of certifying defective data.
2.3.1 Obtaining A Properly Executed Certificate

2.3.2 Identifying The Consequences Of Certifying Defective Data

2.3.1 Obtaining A Properly Executed Certificate

Situations Requiring a Certificate (FAR 15.403-4(c) and FAR 15.406-2(a)). Whenever you obtain cost or pricing data, you must require a Certificate of Current Cost or Pricing Data unless the contracting officer finds after data submission that the proposal qualifies for an exception to the submission requirement. Never require a Certificate of Current Cost or Pricing Data when a proposal qualifies for an exception. If the contracting officer determines after data submission that a proposal should be excepted from the cost or pricing data requirement, treat the data received as information other than cost or pricing data.

Certificate Wording (FAR 15.401, FAR 15.403-4(b), and FAR 15.406-2(a)). FAR prescribes the following wording for the Certificate of Current Cost or Pricing Data:

Certificate Of Current Cost Or Pricing Data
This is to certify that, to the best of my knowledge and belief, the cost or pricing data (as defined in section FAR 2.101 of the Federal Acquisition Regulation (FAR) and required under FAR subsection FAR 15.403-4) submitted, either actually or by specific identification in writing, to the contracting officer or to the contracting officer's representative in support of ________* are accurate, complete, and current as of ________**. This certification includes the cost or pricing data supporting any advance agreements and forward pricing rate agreements between the offeror and the Government that are part of the proposal.

Firm __________________________________________
Signature _______________________________________
Name _________________________________________
Title ____________________________
_____________________________________
Date of execution*** _____________________________

* Identify the proposal, request for price adjustment, or other submission involved, giving the appropriate identifying number (e.g., RFP No.).
** Insert the day, month, and year when price negotiations were concluded and price agreement was reached or, if applicable, an earlier date agreed upon between the parties that is as close as practicable to the date of agreement on price.
*** Insert the day, month, and year of signing, which should be as close as practicable to the date when the price negotiations were concluded and the contract price was agreed to.

Assure that the offeror uses the exact wording prescribed in FAR 15.406-2(a). If you accept any variation, you could potentially invalidate the certification.

For example: An offeror might substitute the following sentence for the last sentence of the required certification, "This certification includes only the data used to estimate direct labor hours and direct material dollars." The offeror may be trying to limit the certification or may erroneously think that forward pricing rate agreements have their own certification. If you accept the modified certification, you may limit or waive the Government's rights to pursue remedies for any defective labor or overhead rates.

Other Elements of a Properly Worded Certificate (FAR 15.406-2(a)). In addition to the exact FAR language, a properly executed Certificate of Current Cost or Pricing Data must include the following elements:

- Identification of the proposal, quotation, request for price adjustment, or other submission involved, giving the appropriate identifying number;
- Date when price negotiations were concluded and price agreement was reached or, if applicable, an earlier date agreed upon between the parties that is as close as practicable to the date of agreement on price;
- Name of the firm entering into the agreement with the Government;
- Name and signature of the individual signing the Certificate on behalf of the firm;
- Title of the individual signing the Certificate on behalf of the firm; and the
- Date of Certificate execution.
Certification Timing (FAR 15.406-2, FAR 52.215-20(b)(2), and FAR 52.215-21(b)(2)). Require the offeror to submit the Certificate of Current Cost or Pricing Data:

- On or after the "as of" date on the Certificate. The "as of" date may either be:
  - The date when price negotiations were concluded and price agreement was reached, or (if applicable).
  - Another date agreed upon between the parties that is as close as practicable to the date of agreement on price.
  - The contracting officer and the offeror are encouraged to reach prior agreement on criteria for establishing closing or cutoff dates when appropriate in order to minimize delays associated with proposal updates.
  - The offeror should include closing or cutoff dates as part of the data submitted with the proposal and, before agreement on price, data should be updated to the latest closing or cutoff dates for which data are available (e.g., the most recent end-of-month report).

- Prior to executing the contract award or bilateral modification.

Documenting Data Submitted or Identified by the Offeror (FAR Table 15-2). When an offeror is required to submit cost or pricing data, consider every piece of information submitted or identified by the offeror as potential cost or pricing data. Assure that the existence and location of the data are clearly documented. FAR Table 15-2 requires the offeror to submit an appropriately referenced index of all cost or pricing data accompanying or identified in its proposal. The offeror must annotate any additions or revisions, up to the date of price agreement, or earlier date agreed upon by the parties. Assure that the index is an accurate record of the data provided. Accepting the index without question indicates agreement that the Government has received all the data identified.

Data and Judgment (FAR 15.401 and FAR 15.406-2(b)). What is the offeror certifying with the Certificate of Current Cost or Pricing Data? The offeror is certifying that the cost or pricing data submitted are accurate, complete, and current.

Remember that cost or pricing data are facts not judgment. The Certificate does not certify the accuracy of the offeror's judgment in making the projections or estimates (educated guesses) of future costs using these data. It applies only to the data upon which the judgment and estimate were based.

For example: The offeror estimates labor hours based on a recent contract for an identical item. Contract accounting records confirm that the contract required $10,000 of material per unit. Government indexes confirm that there has been a five percent price increase for similar material since the last contract. The offeror estimates that the new contract will require $10,500 of material per unit ($10,000 plus 5% for inflation). The material cost for the last contract is a fact. The general price increase for similar material is a fact. Using that increase to adjust material prices is judgment. This judgment may or may not be reasonable (e.g., actual prices for the material specifically required for this contract may have decreased). Either way, the judgment is not subject to certification or defective pricing remedies. Only the facts are subject to certification as accurate, complete, and current.

Complete Knowledge (FAR 15.406-2). In the Certificate of Current Cost or Pricing Data, the offeror's representative certifies that the data submitted are accurate, complete, and current to the "best of my knowledge and belief" as of the time when negotiations were concluded and price agreement was reached or (if applicable) an earlier date agreed upon between the parties that is as close as practicable to the date of agreement on price.

If something affecting cost changed between the "as of" date and the date of the certification, the offeror is not required to inform the Government. However, if anyone in the offeror's firm knew, on the "as of" date, of any data that may have reasonably resulted in a lower contract price, then that data should have been disclosed. If the data were not disclosed prior to agreement on price, then they must be disclosed when the Certificate is submitted. Failure to disclose the data constitutes defective pricing.

For example: An offeror's subcontract negotiator negotiated a $100,000 price reduction on the $450,000 subcontract proposal used as a basis for contract pricing. Data on the negotiated reduction were not disclosed to the offeror's negotiator or the Government because the subcontract had not been signed. That would likely be considered defective pricing, because offeror personnel knew of the subcontract price reduction.
2.3.2 Identifying the Consequences Of Certifying Defective Data

**Defective Pricing (FAR 15.407-1(b)).**

**Defective pricing** exists when any price, including profit or fee, for any purchase action covered by a Certificate of Current Cost or Pricing Data, is increased by any significant amount because the data were not accurate, complete, or current.

**For example:** The following table provides examples of defects related to the three different cost or pricing data requirements:

<table>
<thead>
<tr>
<th>Defect</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data are not accurate.</td>
<td>The decimal point was accidentally or purposefully moved one place to the right. As a result, the costs used for trend analysis of a key component were ten times the actual cost.</td>
</tr>
<tr>
<td>Data are not complete.</td>
<td>The past history of vendor prices did not include two recent purchases with lower prices for the item being procured.</td>
</tr>
<tr>
<td>Data are not current.</td>
<td>Actual production costs for last month were available but not provided. Instead estimates were based on higher costs from earlier production.</td>
</tr>
</tbody>
</table>

**Government Rights Under Defective Pricing** (FAR 15.407-1, FAR 52.215-10, FAR 52.215-11, and FAR 32.902).

Under contract defective pricing clauses, the Government is entitled to:

- A price adjustment, including profit or fee, for any price increase that resulted because defective data were provided by the contractor. (This is one reason why proper cost analysis documentation is so important.)

- Interest on any overpayments that resulted from the defective pricing. When calculating overpayments, do not include contract financing.

- Penalty amounts equal to the amount of any overpayments when the contractor knowingly submitted defective cost or pricing data. Obtain the advice of Government legal counsel, before taking any contractual actions concerning penalties.

When a defective pricing clause applies, the Government's right to a price adjustment under defective pricing is not affected by any of the following circumstances:

- The contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the contract price would not have been modified even if accurate, complete, and current cost or pricing data had been submitted;

- The contracting officer should have known that the cost or pricing data were defective even though the contractor or subcontractor took no affirmative action to bring the character of the data to the contracting officer's attention;

- The contract price was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under such contract; or

- The contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

**Offsets Under Defective Pricing** (FAR 15.407-1(b)). As you calculate the price adjustment due the Government under defective pricing, allow an offset for any estimates that were understated, because cost or pricing data submitted in support of the same pricing action were not accurate, complete, or
current.

- Never allow the offset to exceed the amount due the Government (i.e., the contract price can never increase because of defective pricing).

- Only allow an offset in an amount supported by the facts and only if the contractor:
  - Certifies that, to the best of the contractor's knowledge and belief, the contractor is entitled to the offset in the amount requested, and
  - Proves that the cost or pricing data were available before the date of agreement on price but were not submitted. Offsets need not be in the same cost groupings as the defective pricing (e.g., material, direct labor, or indirect costs).

- Never allow an offset if:
  - The understated data were known by the contractor to be understated before the "as of" date specified in the Certificate of Current Cost or Pricing Data, or
  - The Government proves that the facts demonstrate that the price would not have increased in the amount to be offset even if the available data had been submitted before the "as of" date specified in the Certificate of Current Cost or Pricing Data.

**Offset example:** Contract price was overstated by $100,000 because the offeror did not provide accurate, complete, or current material cost data. For the same contract action, contract price was understated by $75,000 because the offeror did not provide accurate, complete, or current wage rate data. The amount due the Government would be $25,000.

**Penalties and Fraud for Knowingly Withheld Data (GAO/T-NSIAD-88-45, Pages 4-5).** The following is an example of defective pricing identified by the General Accounting Office:

A contract was found to be overpriced by $1 million because the company did not disclose lower prices on seven material items. As negotiations were concluding, the material estimating department provided the firm's negotiator a 1-page update showing that substantially lower prices had been received on three of the seven items. However, the firm's negotiator did not disclose the lower prices to the contracting officer. This is an example of a situation where you should obtain legal counsel before taking action.

- It appears that the Government may be entitled to penalty amounts equal to the amount of any overpayments, because the contractor knowingly failed to update its cost or pricing data.

- However, the contractor's knowing failure to update its cost or pricing data also appears to be evidence of intent to **defraud** the Government. Possibly the case should be prosecuted as a fraud case rather than defective pricing.

The Government cannot pursue both remedies for the same overpricing. Legal counsel can provide you with advice on the proper course of action and the evidence required to support that course of action. **Audit Scrutiny (DCAM 14-121.2).** Most Government auditors consider repetitive findings of defective pricing findings in the same firm as an indicator of fraud. Thus repetitive defective pricing findings may lead to substantially more intensive audit scrutiny.

### 2.4 Recognizing The Need For Information Other Than Cost Or Pricing Data

**Situations That May Require Cost Information Other Than Cost or Pricing Data (FAR 15.402 and FAR 15.404-1(d)).**

Only require an offeror to submit cost information other than cost or pricing data when you expect that the offeror will be excepted from submitting certified cost or pricing data, but you need cost information to determine price reasonableness or cost realism. The table below provides several examples of such situations. Government technical and audit assistance may be required to analyze the cost information and answer related questions.

<table>
<thead>
<tr>
<th>Contracting Situation</th>
<th>Analysis Purpose</th>
<th>Analysis Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>You expect a single offer at or below the cost or pricing data</td>
<td>Support determination of price reasonableness</td>
<td>Does the proposed price appear</td>
</tr>
<tr>
<td>Threshold, and you do not expect to be able to determine price reasonableness using price analysis alone.</td>
<td>Reasonable based on its relationship with estimated costs?</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>You expect a single offer greater than the cost or pricing data threshold that will be excepted from cost or pricing data requirements, but you do not expect to be able to determine price reasonableness using price analysis alone.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You expect competitive offers, but because of technical differences, you do not expect to be able to determine price reasonableness using price analysis alone.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You expect competitive offers for a cost-reimbursement contract.</td>
<td>Cost realism analysis to determine probable final cost to the Government.</td>
<td></td>
</tr>
<tr>
<td>You expect competitive offers for a fixed-price contract, but new requirements may not be understood by all offerors.</td>
<td>Cost realism analysis to determine an offeror understands all contract requirements.</td>
<td></td>
</tr>
<tr>
<td>You expect competitive offers for a fixed-price contract, but you have concerns about the performance quality that will result from each offeror’s proposal.</td>
<td>Cost realism analysis to determine an offeror’s ability to deliver proposed quality at the proposed price.</td>
<td></td>
</tr>
<tr>
<td>You expect competitive offers for a fixed-price contract, but market analysis leads you to believe that some offerors may propose unrealistic prices that would jeopardize contract performance.</td>
<td>Cost realism analysis to determine an offeror’s ability to meet all contract requirements at the proposed price.</td>
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</tbody>
</table>

**Tailor Information Requirements (FAR 15.403-3(a) and Table 15-2).** Tailor any requirements for cost information other than cost or pricing data so that you only require information essential to your analysis, but not readily available from other sources.

- Identify cost elements that must be considered in evaluating price reasonableness or cost realism.
- Use FAR Table 15-2 to identify the type of information that might be useful in evaluating a particular cost element.
- Identify information readily available from other sources.
- Limit cost information requirements to those facts necessary to determine price reasonableness or cost realism but not available from other sources.

**For example:** Suppose you are acquiring an estimated $300,000 research study from the only known source. You expect that material and other direct costs will be a small portion of the total price. You have
a copy of a Forward Pricing Rate Agreement (FPRA) with the firm, which covers direct labor rates and indirect cost rates (based on direct labor cost). Given these facts, you are particularly concerned about estimated direct labor hours. The solicitation might require an offeror to submit information on:

- Proposed labor hours and costs by task and labor category.
- Total material costs and total other direct costs without further breakdown of those costs.
- Proposed indirect cost, by category (e.g., overhead and general administrative cost).
- Proposed profit or fee.

_format requirements_ (FAR 15.403-3(a)(2), FAR 15.408(l)(4), FAR 15.408(m)(4), FAR 52.215-20, and FAR 52.215-21).
The solicitation/contract must describe the format required for offeror submission of cost information other than cost or pricing data.

- State that the offeror may select an appropriate format unless the contracting officer decides that use of a specific format is essential.
- If the contracting officer decides that a specific format is essential, assure format requirements are clearly described.

_requirement for access to records_ (FAR 15.403-5(a)(4), FAR 15.408(l)(4), FAR 15.408(m)(4), FAR 52.215-20, and FAR 52.215-21).
The solicitation/contract must describe the requirement for preaward or post award access to the offeror's records.

- Preaward access requirements should normally permit the contracting officer or an authorized representative the right to examine offeror books, records, documents, or other directly pertinent records to verify the reasonableness of proposed costs.
- Post award access is normally not required for cost information other than cost or pricing data.

_requirement for current information_ (FAR 15.403-3(a)(3)). Ensure that the information used to support price negotiations is sufficiently current to permit negotiation of a fair and reasonable price. However, you should limit requests for updated offeror information to information that effects the adequacy of the proposal for negotiations.

Never require the offeror to certify that the cost information other than cost or pricing data provided to the Government is accurate, complete, or current. Contracts should not provide for price adjustments because the contractor did not provide accurate, complete, or current cost information.

- 3.0 - Chapter Introduction
- 3.1 - Cost Measurement, Assignment, and Allocability
- 3.2 - CAS
- 3.3 - Identifying Allowability Factors to Consider
  - 3.3.1 - Identifying Factors That Affect Cost Reasonableness
  - 3.3.2 - Identifying Contract Terms That Affect Cost Allowability
- 3.4 - Determining the Allowability of Specific Costs

3.0 Chapter Introduction

_cost allowability_ (FAR 31.201-1(b)). While the total cost of a contract includes all costs properly allocable to the contract, the costs which the Government will pay are limited to those costs which are allowable pursuant to FAR Part 31 and applicable agency supplements.

_factors affecting cost allowability_ (FAR 31.201-2). Consider the following factors in determining cost allowability:

- Reasonableness;
- Allocability (requires a cost to be properly measured, assigned, and allocated);
- Applicable accounting practices and standards;
• Applicable cost principles; and
• Terms of the contract.

As you make your determination on cost allowability, remember that to be allowable, a cost must be properly measured, assigned, and allocated. A cost is first measured (how much is the cost), then assigned (to which cost accounting period should the cost be booked), and then allocated (how much of the cost should be assigned to each of the contracts being performed in the accounting period in which the cost is booked). Measurement, assignment, and allocation are determined using (1) the Cost Accounting Standards (CAS) (for contracts subject to the CAS), (2) FAR Part 31 (when the contract is not subject to CAS or where the FAR addresses an area of the cost where CAS is silent), and (3) Generally Accepted Accounting Principles (when the CAS and FAR are either silent and/or do not apply).

3.1 - Cost Measurement, Assignment, and Allocability

For contracts covered by the cost accounting standards, costs are subject to the measurement, assignment, and allocability provisions contained in the nineteen standards (for contractor business units that are subject to modified coverage, the costs are subject to the provisions of only four of those standards, CAS 401, 402, 405, and 406). For those contracts that are not subject to the CAS, and for those areas of cost that are not covered by the standards, the measurement, assignment, and allocability provisions of FAR Part 31 apply. When the CAS does not apply (or is silent regarding the measurement or assignment of a particular area of cost) and FAR Part 31 does not specifically address the measurement or assignment of a particular area of cost, the provisions of Generally Accepted Accounting Principles (GAAP) must be followed in determining the proper cost measurement and assignment (note that GAAP does not address cost allocability).

3.2 - CAS

Cost Accounting Standards Board (48 C.F.R. Chapter 99 (FAR Appendix, Subchapter A, Part 9901)); FAR 30.101; and DCAM 8-102). Cost Accounting Standards are issued by the Cost Accounting Standards Board (CASB). The Board was first established in 1970 when Congress passed Public Law 91-379. It operated as an independent arm of Congress from 1970 until September 30, 1980. On that date, the Board ceased to function, because Congress did not fund the Board for the new fiscal year. Although the Board ceased operations, the 19 Cost Accounting Standards promulgated by the Board remained in force. Board interpretations were also used in applying those Standards.

In 1990, the new 5-member CASB began operation under the Office of Federal Procurement Policy (OFPP). Membership includes:
• The OFPP Administrator, Chairperson;
• A Department of Defense representative;
• A General Services Administration representative;
• Two private sector representatives:
  o An industry representative; and
  o An individual with knowledge about cost accounting problems and systems.

The current CASB has assumed the responsibilities of the old board. Standards and Board rules and procedures were recodified under Public Law 100-679. All of the waivers, exemptions, modifications, rules, and regulations promulgated by the original Board remain in effect until amended, superseded, or rescinded by the new Board. Standards are reprinted in the Appendix of the FAR along with procedures for applying CAS (e.g., exemptions to CAS and CAS-related requirements for any particular contract action).

CAS Coverage (FAR Appendix, Subchapter B, Part 9903). When a contract is CAS-covered, the Standards take precedence over all other accounting rules or guidance. The table below lists the 19 standards:

<table>
<thead>
<tr>
<th>Cost Accounting Standards</th>
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</thead>
<tbody>
<tr>
<td>Concepts and Principles</td>
</tr>
<tr>
<td>CAS 401</td>
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<tr>
<td>CAS 402</td>
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<td>CAS 403</td>
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<td>CAS 418</td>
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<td>CAS 419</td>
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<td>CAS 420</td>
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</tbody>
</table>

**CAS Exemptions** (FAR Appendix, Subchapter B, Part 9903.201-1 (b)). All contracts awarded using sealed bidding are exempt from CAS coverage. When awarding a contract using negotiation procedures, CAS applies unless the contract or offeror is specifically exempt from CAS requirements.

A contract or subcontract that is not CAS-covered at the time of award cannot become CAS-covered as the result of a contract or subcontract modification.

**Criteria for Exempting Negotiated Contracts or Subcontracts From CAS Coverage**

<table>
<thead>
<tr>
<th>Basis For Exemption</th>
<th>Exempt If Any of the Following Situations Exist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Unit</td>
<td>The business unit receiving the award is not performing at least one CAS-covered contract or subcontract in excess of $7,500,000 at the time of the award.</td>
</tr>
<tr>
<td>Dollar Amount of Contract Award</td>
<td>The contract or subcontract price is less than or equal to $650,000 at the time of award. (When determining CAS exemptions, treat an order issued by one segment of a corporation to another as a subcontract.)</td>
</tr>
<tr>
<td>Small Business</td>
<td>The contract or subcontract is with a small business.</td>
</tr>
<tr>
<td>Commercial Item(s)</td>
<td>The firm fixed-price or fixed-price economic adjustment (provided that price adjustment is not based on actual costs incurred) contract or subcontract is for commercial item(s).</td>
</tr>
</tbody>
</table>
Method of Pricing

The contract or subcontract price is set by law or regulation. The contract or subcontract is firm fixed-price, is awarded based on adequate price competition, and is awarded without submission of (certified) cost or pricing data.

Foreign Contractor/Performance

- The contract or subcontract is with a foreign government, agent, or instrumentality, or for the requirements of CAS 401 and 402, any contract or subcontract awarded to a foreign concern.
- The contract or subcontract will be executed and performed entirely outside the United States, its territories, and possessions.
- The subcontract under the NATO PHM Ship program will be performed outside the United States by a foreign concern.

Types of CAS Coverage ([FAR Appendix, Part 9903.2](#)). You can find guidance on CAS contract and disclosure requirements in FAR App B, 9903.2. In general, you should know that there are two types of coverage for noncommercial contracts and subcontracts.

<table>
<thead>
<tr>
<th>CAS Coverage</th>
<th>Application</th>
<th>Coverage requires that the business unit:</th>
</tr>
</thead>
</table>
| Full         | Applies to contractor business units that:  
  - Receive a single CAS-covered contract award of $50 million or more; or  
  - Received $50 million or more in net CAS-covered awards during its preceding cost accounting period. | Comply with all Standards that are in effect on the date of contract award and with any Standards that become applicable because of later award of a CAS-covered contract. |
| Modified     | If the offeror certifies that it is eligible for and elects to use modified coverage, it may be applied to a CAS-covered contract of:  
  - Less than $50 million awarded to a business unit that received less than $50 million in net CAS-covered awards in the immediately preceding cost accounting period. | Comply with CAS 401, 402, 405, and 406. Note: A contract awarded with modified CAS coverage shall remain subject to modified coverage throughout its life regardless of changes in the business unit’s CAS status during subsequent cost accounting periods. |

Disclosure Statement ([FAR Appendix B, 9903.202-1](#) and [FAR Appendix B, 903.202-9](#)). A Disclosure Statement is a written description of a contractor’s cost accounting practices and procedures. Disclosure is made using a Disclosure Statement Form (CASB DS-1) and requires the contractor to provide general information on its accounting system and specific information on how the firm accounts for specific types of costs.

A Disclosure Statement is required for:
- Any business unit that receives a contract in excess of $50 million.
- Any company which, together with its segments, received net CAS-covered contract awards exceeding $50 million in the contractor’s previous accounting period.

When a Disclosure Statement is required, the firm must submit a separate Disclosure Statement for each segment with costs exceeding $650,000 in the total price of any CAS-covered contract or subcontract,
unless:

- The contract or subcontract is of the type or value exempted from CAS requirements; or
- CAS-covered awards in the most recently completed cost accounting period are less than 30 percent of total segment sales for the period and less than $10 million.

Each corporate or other home office that allocates costs to one or more disclosing segments performing CAS-covered contracts must submit a completed Part VIII of the Disclosure Statement.

Disclosure Statement for Foreign Firms (FAR Appendix B, 9903.202-1(e)). Foreign contractors and subcontractors who are required to submit a Disclosure Statement may, in lieu of filing a CASB-DS-1, make disclosure by using a disclosure form prescribed by an agency of its Government, provided that the Cost Accounting Standards Board determines that the information disclosed by that means will satisfy the objectives of Public Law 100-679. Currently, the use of alternative forms has been approved for the contractors of Canada, the Federal Republic of Germany and the United Kingdom.

Disclosure Statement Review (FAR 30.202-6). The Cognizant Federal Agency Official (CFAO) and the cognizant auditor have primary responsibility for the Disclosure Statement review:

- Adequacy Review. The cognizant auditor reviews the Disclosure Statement to ascertain whether it is current, accurate, and complete and report the results of that review to the CFAO. The CFAO determines if the Disclosure Statement adequately discloses the firm's accounting practices. If it is adequate, the CFAO must notify the contractor in writing with copies to the cognizant auditor and affected contracting officers. If not, the CFAO must request a revised disclosure statement.

- Compliance Review. After the notification of adequacy, the auditor conducts a compliance review to ascertain whether or not the disclosed practices comply with CAS and FAR Part 31. The CFAO determines if the Disclosure Statement complies with CAS. If the Disclosure Statement allegedly does not comply with CAS, the CFAO shall take action regarding the non-compliance to include requesting a revised Disclosure Statement that corrects the CAS non-compliance.

FAR Guidance (FAR Part 31). FAR Part 31 provides guidance on cost accounting issues. For example, FAR defines direct and indirect costs and provides general guidelines for accounting treatment.

Some of the FAR cost principles (presented in the next section) provide detailed guidance for cost accounting, including measurement, assignment, and allocation of costs. In some cases, those cost principles apply CAS requirements to all contracts whether the offeror is CAS-covered or not. For example, FAR 31.205-10, Cost of Money, extends the requirements of CAS 414 to contracts that are not CAS-covered, when the contractor meets certain conditions.

Generally Accepted Accounting Principles. Generally Accepted Accounting Principles (GAAP) are a set of uniform accounting rules for assignment and measurement (but not allocation) of costs that are used for recording and reporting financial data to accurately represent an organization's financial condition. They represent a body of accounting research, precedents, and standards of financial reporting that have evolved over the years.

These standards are endorsed by the Financial Accounting Standards Board (FASB) and their use is required by the Securities and Exchange Commission (SEC) for corporations under its jurisdiction. They are also commonly used by business entities not under SEC jurisdiction. When the CAS and FAR are silent on how a cost should be measured and/or assigned, GAAP applies.

When CAS is silent regarding the allocability of a particular area of cost, the provisions at FAR 31.201-4, Determining Allocability apply.

Typically, we think of cost objectives as individual contracts or jobs. However, cost objectives can also include special company projects, independent research, or items in a particular production lot. For example: The following are examples of proper cost allocation:

- The cost of a component used to produce a particular product, should logically be charged to that product and only that product.
- The rent for a building used to produce several different products should be allocated to the various products produced in the building. Logically, the product that benefits the most from the
building should bear the greatest share of the cost.

*Questions to Consider in Determining Cost Allocability (FAR 31.201-4).* There are three questions you should consider as you decide if a particular cost is properly allocated to a particular contract:

1. **Were the costs specifically incurred for a single cost objective?**

   **Yes:** If the costs were incurred for one objective, then the costs should be assigned to that objective and NOT allocated to other non-benefiting objectives.

   **For example:** A company proposes to allocate the cost of material used to complete a Government contract to that contract. That allocation appears acceptable because the cost objective that receives the benefit bears the cost.

   **No:** If the costs were incurred for more than one objective, then they must be allocated to all benefiting objectives.

   **For example:** A company proposes to allocate the cost of office supplies used throughout the company to a single Government contract. That allocation would shift a cost that should be borne by all contracts to a single contract.

2. **Are costs that benefit the contract and other work allocated in reasonable proportion to the benefit received?**

   **Yes:** If the contract does benefit the contract and other work, the cost must be equitably allocated to all benefiting cost objectives.

   **For example:** A company allocates the cost of a technical word processing department by dividing the department operation cost by the number of pages produced during the year and then charging each cost objective based on the number of pages produced to support that objective. That allocation appears reasonable because costs are allocated to cost objectives based on the benefit received.

   **No:** If the allocation is disproportionate, then too much cost is being allocated to some cost objective(s) and too little to other cost objective(s).

   **For example:** A company has production equipment used relatively equally on all Government and commercial contracts. The company proposes to charge the entire cost of maintaining that equipment to Government contracts. That would not be a proper allocation of the cost, because Government contracts would bear the entire cost even though commercial contracts benefit equally.

3. **Is the cost necessary to the overall operation of the business, although there is no direct relationship to any particular cost objective?**

   **Yes:** These expenses are commonly known as general & administrative expenses. If the costs are necessary for overall operation of the business, then it is assumed that they are of general (overall) benefit to all cost objectives.

   **For example:** A company proposes to charge the salary of the chief executive officer's secretary to all operations, because the secretary is necessary to the operation of the firm. That appears to be a proper cost allocation because even though the secretary's activities may not benefit any particular product, they do support the overall operation of the firm.

   **No:** If the cost does not benefit any specific cost objective and does not support the overall operation of the company, it should not be allocated to Government contracts.

   **For example:** The company employs the president's son at a salary of $100,000 per year, but there is no evidence that he has performed any work that is of benefit to the company. This salary should not be allocated to any Government contracts, because it is not necessary for the overall operation of the company.
3.3 - Identifying Allowability Factors to Consider

Pricing Decision (FAR 15.404-1(a) and 15.404-2(a)(2)). The factors affecting allowability can be complex and applying them to a contract situation requires careful judgment. For complex questions, you may need assistance from other members of the Government Acquisition Team. Support from the cognizant Government auditor and technical experts can be particularly valuable. However, remember that the contracting officer is ultimately responsible for evaluating price reasonableness and determining the level of analysis required to complete that evaluation.

3.3.1 - Identifying Factors That Affect Cost Reasonableness

Once a cost has been properly measured, assigned, and allocated, the specific allowability factors in FAR Part 31 must be considered. One of the factors to consider is reasonableness. This section examines what you should consider in determining whether a proposed or incurred contract cost is reasonable.

Defining a Reasonable Cost (FAR 31.201-3(a)). A cost is reasonable if, in its nature and amount, it does not exceed what a prudent person would incur in the conduct of competitive business.

The underlying assumption in this definition is that a firm in a competitive business will minimize unnecessary costs in order to remain competitive. If a firm does not minimize unnecessary costs, then competitors will underbid the firm and take away market share.

You normally perform cost analysis in an environment where competition is inadequate for determining price reasonableness or cost realism. Therefore, the objective of cost analysis is to determine what the reasonable cost would be if the offeror were operating in a competitive environment. Reasonableness of Incurred Costs (FAR 31.201-3(a)). Both proposed costs and actual incurred costs are subject to the tests of reasonableness. The offeror must demonstrate the reasonableness of any incurred cost and cannot simply state that, because the expense has been incurred, it is automatically reasonable. Questions to Consider in Determining Cost Reasonableness (FAR 31.201-3(b)). There are four questions you should consider as you decide if a particular cost is reasonable. In some situations, your answers to these questions may lead you to other questions that you must answer before you can make a final decision on cost reasonableness.

1. Is the type of cost generally recognized as necessary in conducting business?

Yes: Then it meets this test of reasonableness.

For example: Payment of state and local franchise taxes is a necessary cost of conducting business.

No: If this is not necessary, it may be inappropriate for the contract.

For example: The purchase and up-keep of an ocean-going yacht for exclusive use of the company president is NOT a necessary cost of doing business.

2. Is the cost consistent with sound business practice, law, and regulation, and are purchases conducted on an "arm's-length" basis?

Yes: Then it meets this test of reasonableness.

For example: Construction of a waste treatment plant to comply with environmental standards is consistent with sound practice and the law.

No: If it is inconsistent with sound practice or violates law or regulation, then all or part of the cost is unreasonable.

For example: Paying a premium price for materials on a Government contract while receiving a bargain price of the same materials for use on a commercial contract under a "basket" purchase deal is NOT consistent with sound business practice.

3. Does the offeror's action reflect a responsible attitude toward the Government, other customers, the owners of the business, the employees, and the public-at-large?
Yes: Then the cost meets this test of reasonableness.

For example: A good price analysis, and when necessary, cost analysis of supplier proposals prior to awarding purchase orders on Government cost-reimbursement contracts reflects a responsible attitude toward the use of taxpayer dollars.

No: If the offeror is acting irresponsibly, then some or all of the costs are probably unreasonable.

For example: Paying excessive salaries to executives and unconscionable retainers for retired executives as consultants does not demonstrate acting responsibly toward the owners of the business or its employees.

4. Are the offeror’s actions consistent with established practices?

Yes: Then the costs meet this test of reasonableness.

For example: The offeror proposed to contract out source inspection of subcontractor parts. Company policy has always required inspection by corporate or subcontract inspectors. Cost will be lower and quality standards will be maintained by the proposed subcontractor. It would be reasonable to accept the proposed change.

No: If the offeror is deviating from established practices, then there is likelihood that the costs may be unreasonable.

For example: The contractor proposes to contract out redesign effort. Company policy and past practice has been to keep all design effort “in-house”. Upon further review, you find that in-house resources are available and the cost would be substantially lower than contracting out. It would be unreasonable to accept the proposed redesign cost.

3.3.2 - Identifying Contract Terms That Affect Cost Allowability

Contract Terms and Cost Allowability. Specific types of cost are often addressed in a contract or request for proposal (RFP). For example, while product transportation costs are generally allowable, the contract may restrict "allowed" transportation costs to a specific mode (e.g., 3rd class mail).

However, the contract terms can only be more restrictive than the other factors that must be considered in determining cost allowability, not less. In other words, the contract terms cannot allow a cost that is:

- Not reasonable;
- Not properly measured, assigned and allocated to the contract;
- Not allowable in accordance with specific cost principles.

3.4 - Determining the Allowability of Specific Costs

Introduction to Cost Principles (FAR 31.205). Specific cost principles for contracts with commercial organizations are found in FAR Part 31.205. Currently, there are 48 cost principles. Over the years, the number and wording of these principles have been revised to reflect changes in:

- Business practices (e.g., the large number of business takeovers in the 1980s);
- Public law (e.g., specific legal prohibitions on lobbying costs); and
- Legal precedents established by the court system and the boards of contract appeals.

For example: The cost principle on goodwill was created to address an Armed Services Board of Contract Appeals opinion on a related issue. That opinion alluded to the possible recognition of goodwill as an allowable cost on Government contracts. Goodwill is the difference between the book value of an asset being purchased and a higher amount actually paid by the firm making the purchase. Because they felt that it is inappropriate for the Government to subsidize corporate takeovers, procurement authorities published a cost principle disallowing any costs related to goodwill.

Cost Principles for Other Contracting Environments (FAR Part 31). While cost principle consideration in
this text will center on the cost principles for commercial organizations, FAR also identifies cost principles for contracts with:

- Educational institutions (see Office of Management and Budget (OMB) Circular A-21, Cost Principles for Educational Institutions;
- State, local, and Federally recognized Indian tribal governments (see OMB Circular A-87 Cost Principles for State, Local and Federally Recognized Indian Tribal Governments and FAR 31.603(b); and
- Nonprofit organizations (see OMB Circular A-122, Cost Principles for Nonprofit Organizations and FAR 31.603(b)).

Categories of Cost Identified By the Cost Principles (FAR 31.205). Each cost principle defines a particular type of cost and establishes whether it is allowable, unallowable, or allowable with some restrictions.

- **Allowable cost.** As you perform a cost analysis, a cost is allowable, if it is expressly identified as allowable in the cost principles, and it meets the relevant tests for reasonableness; allocability; compliance with cost accounting principles and the terms of the contract.

- **Unallowable cost.** Many cost principles identify specific types of cost as unallowable. When you perform a cost analysis, you must not allow any proposed or actual costs identified by the cost principles as unallowable.

- **Allowable cost with restrictions.** Many cost principles state that specific costs are allowable, but establish restrictions on the amount that can be considered reasonable. When you perform a cost analysis, you cannot allow proposed or actual costs that exceed the limit set forth in the cost principle.

- **Costs Not Specifically Addressed.** The fact that a cost is not specifically mentioned does not imply that it is either allowable or unallowable. FAR 31.204(d) requires that the determination of allowability shall be based on the contract cost principles in FAR Part 31 and the treatment of similar or related selected items in FAR Part 31.205.

Cost Principles Summary (FAR 31.205). The table below summarizes the cost guidance provided by the current cost principles in FAR 31.205. Note that a single cost principle may classify specific costs as allowable, other costs in the same general category as unallowable, and still others as allowable with restrictions.

<table>
<thead>
<tr>
<th>Allowability Of Selected Costs Under FAR 31.205</th>
<th>Selected Costs</th>
<th>FAR Ref.</th>
<th>A</th>
<th>UA</th>
<th>AWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholic Beverages</td>
<td>31.205-51</td>
<td>[Link](<a href="http://far">http://far</a> site.hill. af.mil/re ghtml/re gs/far2a fmcfars/ fardfars/ far/31.htm - P1117 200343)</td>
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<tr>
<td>Asset Valuations Resulting from Business Combinations</td>
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<tr>
<td>Bonding Costs</td>
<td>31.205-4</td>
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<tr>
<td>Compensation for Personal Services</td>
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<td>Contingencies</td>
<td>31.205-7</td>
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<tr>
<td>Contributions or Donations</td>
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<td>Economic Planning Costs</td>
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- Losses on Other Contracts: [http://far site.hill.af.mil/re ghtml/re gs/far2a fmcfars/ fardfars/f ar/31.ht m - P788_1 41392](http://far site.hill.af.mil/re ghtml/re gs/far2a fmcfars/ fardfars/f ar/31.ht m - P788_1 41392)
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Consider all Relevant Cost Principles (FAR 31.204(d), FAR 31.205-8 and FAR 31.205-1). For some costs, more than one cost principle may apply to your decision on cost reasonableness. In such cases, you must consider all relevant cost principles.

**For example:** An offeror's overhead rate includes the cost of sponsoring a blood drive for the community hospital. Is this donation allowable?

Reviewing the list of cost principles, the one entitled Contributions or Donations appears most relevant in this situation. Reading that cost principle, you would find the following:

FAR 31.205-8, Contributions or Donations.

Contributions or donations, including cash, property and services, regardless of recipient, are unallowable, except as provided in FAR 31.205-1(e)(3).

Based on this cost principle, it appears that the cost of the donation supporting the blood drive is unallowable. However, the referenced cost principle, Public Relations and Advertising Costs, presents a different picture.

FAR 31.205-1, Public Relations and Advertising Costs, paragraph (e).

(e) Allowable public relations costs include the following:
(1) Costs specifically required by contract.
(2) Costs of-
   (i) Responding to inquiries on company policies and activities;
   (ii) Communicating with the public, press, stockholders, creditors, and customers; and
   (iii) Conducting general liaison with news media and Government public relations officers, to the extent that such activities are limited to communication and liaison necessary to keep the public informed on matters of public concern such as notice of contract awards, plant closings or openings, employee layoffs or rehires, financial information, etc.
(3) Costs of participation in community service activities (e.g., blood bank drives, charity drives, savings bond drives, disaster assistance, etc.).

(4) Costs of plant tours and open houses (but see subparagraph (f) (5) of this subsection).

(5) Costs of keel laying, ship launching, commissioning, and roll-out ceremonies, to the extent specifically provided for by contract. This second cost principle specifically states that the cost of participating in blood bank drives is allowable. Of course, the allowability of these costs is still subject to the tests of reasonableness, allocability, compliance with applicable accounting principles and standards and the terms and conditions of the contract.

Accounting for Unallowable Costs (FAR 31.201-6). Offeror/contractor accounting records must identify the following unallowable costs and exclude them from any billing, claim, or proposal applicable to a Government contract:

- Costs that are expressly unallowable or mutually agreed to be unallowable, and
- Directly associated costs that would not have been incurred if the above costs had not been incurred.

Offerors/contractors must also identify any costs (including directly associated costs) which a contracting officer has specifically disallowed in writing pursuant to contract disputes procedures if the costs have been included or used in the computation of any billing, claim, or proposal applicable to a Government contract. This identification requirement also applies to any costs incurred for the same purpose under like circumstances as the costs specifically identified as unallowable.

The practices used by the offeror/contractor in accounting for and presenting unallowable costs must comply with (1) the requirements of CAS 405, Accounting for Unallowable Costs for those contracts subject to CAS-coverage, or (2) the requirements of FAR 31.201-6 for those contracts that are not subject to CAS-coverage.

Directly Associated Costs (FAR 31.201-6(a)). Any costs that would not have been incurred if an unallowable cost had not been incurred are known as directly associated costs and are also unallowable. For example, if the cost of a yacht is unallowable, the crew's salaries and related benefits are also unallowable.

4.0 - Chapter Introduction

4.1 - Recognizing Relevant Information For Cost Analysis

- 4.1.1 - Examining Related Contract Files
- 4.1.2 - Examining Relevant Audits And Technical Reports
- 4.1.3 - Examining Reviews Of Offeror's Systems
- 4.1.4 - Examining Industry Cost Estimating Guides And Standards

4.2 - Requesting Acquisition Team Assistance

4.3 - Evaluating Acquisition Team Assistance

4.0 Chapter Introduction

Cost analysis does not begin when you receive the proposal. Just like price analysis, it begins with market research prior to proposal receipt. In this chapter, you will learn to collect and analyze relevant information before you actually begin your analysis of a cost proposal.

4.1 Recognizing Relevant Information For Cost Analysis

Your market research for cost analysis should center on collecting and analyzing information on the cost of efficient and effective contract performance.

- 4.1.1 - Examining Related Contract Files
- 4.1.2 - Examining Relevant Audits And Technical Reports
4.1.3 - Examining Reviews Of Offeror's Systems

4.1.4 - Examining Industry Cost Estimating Guides And Standards

4.1.1 Examining Related Contract Files

Using Historical Contract Information (FAR 15.406-3(a) and 15.404-1(c)(2)(iii)). Review the available files of contracts with the same firm to learn about offeror pricing practices, the quality of pricing information provided by the offeror, and any precedents established in past negotiations. As with any other historical information, use historical information related to contract costs with care. Always consider differences between the past and the current contracting situations.

Identify Past Problems/Precedents (FAR 15.406-3(a)). Information on problems that may have occurred in previous proposals or past contracts and their resolution can give you useful insight into the accuracy of current estimates. As a minimum, consider the following questions:

- Does the offeror have a history of problems in controlling costs?

Did the offeror experience cost overruns attributable to historical problems that do not or should not exist today? Uncritical use of historical cost projections could lead to excessive contract cost estimates. Are the offeror's past problems in controlling costs relevant to the current proposal?

- Does the offeror have a history of providing adequate cost estimate support?

Proposal errors can seriously affect your ability to perform an effective cost analysis. If a firm has a track record of problems in a certain area, take care to assure that similar problems do not exist in the current proposal.

- Does the offeror have a history of over/under estimating costs?

Historical proposal tendencies may help you to identify proposed costs that require special scrutiny.

- What were the major cost-related problems and negotiation points in past contract negotiations?

The price negotiation memorandum (PNM) should identify cost-related problems and major points that came up during fact-finding and negotiation. These same issues may come up in the current proposal. Referring to past PNMs can help you identify key areas of analysis and tell you how they were handled.

- How did the negotiated price compare with the proposed price?

The PNM should explain the differences between the proposed price, the Government objectives, and the price negotiated. These differences may give you an insight into potential weaknesses in the firm's current proposal.

- Were any pricing precedents established during previous negotiations that may affect the current negotiations?

Past negotiations may have included an agreement on how to handle a specific type of cost in specific situations. Such agreements may establish a precedent that you should consider in the current analysis. However, be careful: do not blindly except precedents that do not make sense in the current situation. Identify Contracting Situation Differences. Identify any differences between the contracting situations of the past and the current contracting situation. These differences may help you identify cost elements requiring special attention during cost analysis. As a minimum, consider the following questions:

- Have there been any changes in production methods?

If the offeror has improved production methods, leading to reductions in costs (e.g., labor, material, or scrap), then those improvements need to be reflected in projected costs.

- Have there been any changes in the offeror's make-or-buy program?

If the offeror has changed component sources, those changes should be considered in cost estimates. Producing previously subcontracted items in-house will normally increase in-house costs and reduce subcontract costs. Give special attention to the effect such changes have on total cost. If such a change increases total cost, offeror make-or-buy decision criteria require further examination.

- Have contract requirements changed?

Changes in Government requirements documents or business terms will likely affect costs. For example, if a tolerance has been relaxed or a specific process or inspection is no longer required, projected costs should change accordingly.

- Have the offeror's accounting practices changed?
If the offeror has changed procedures for classification or accumulation of a particular cost, projected costs may be affected. For example, if a particular type of cost was previously classified as a direct cost, and is now classified as an indirect cost, expect changes in the totals for both cost groupings.

- Have business conditions or general economic conditions changed?

Changes in business or general economic conditions will also affect costs. You must adjust historical costs to consider these changes. The most obvious example is inflation/deflation.

### 4.1.2 Examining Relevant Audits and Technical Reports

*Relevant Audit and Technical Reports* (FAR 15.406-1(a)). Your office may not have direct experience with the offer, but you may be able to obtain audits or technical reports from other offeror proposals. Audits and technical reports can be excellent sources of cost information. Obtain and analyze reports on:

- Other proposals for identical or similar items; and
- Proposed forward pricing rates and factors.

*Reports on Other Proposals for Identical or Similar Items.* Reports on previous procurements of identical or similar items can provide information on cost elements that were particular problems in the past. Knowledge of past problems can give useful insight into the cost elements that will require special attention in cost analysis. Reports may also give you insight into the best approaches to use in your current cost analysis. Consider the following questions:

- How do estimating methods compare with past contracts for the same item?

Changes in estimating methodology are usually attempts to improve cost estimates. However, a change may be an attempt to mask a weakness in the offeror's proposal.

- How do estimating methods for similar items compare with the current proposal?

Often, similar products are produced by the same workers using the same equipment. Similarity is usually identified by similarity of processes, technical requirements, or product. Comparisons can reveal significant data on cost reasonableness. Comparisons with costs for similar products, are particularly useful when the product offered has never been produced before.

- Are any costs questioned in previous reports similar to the costs proposed for the current contract?

If you find patterns of questioned costs, closely scrutinize similar cost estimates for the current proposal.

- Should the analysis methods documented in previous reports be applied to the current contract?

These reports may document useful approaches to cost analysis. Different approaches can provide very different perspectives of cost reasonableness.

*Reports on Proposed Forward Pricing Rates and Factors.* Larger Government contractors typically submit proposals that deal exclusively with the rates and factors used in proposal development. Reports on the analysis of these rates and factors can provide a great deal of useful information on projected offeror operations over the forecasted periods, including:

- Projected business volume;
- Capital expenditures; and
- Work force, skill, and seniority levels.

These reports can be very lengthy. Contact the cognizant administrative contracting officer (ACO) or cognizant auditor prior to requesting them. Based on this contact, you may be able to limit your request to only the specific information that you need for cost analysis. As a minimum, consider the following questions as you review these reports:

- What rates have been recommended by the auditor?

Audit recommendations provide rates that may be useful in cost analysis and contract negotiation, particularly when forward pricing rates have not been negotiated with the Government.

- When an ACO is assigned to negotiate a forward pricing rate agreement, what rates are currently negotiated or recommended?

Never deviate from ACO recommended rates without first contacting the ACO. The ACO may be able to provide more detailed support for the current recommendation. Never deviate from rates set in a Forward
Pricing Rate Agreement (FPRA) unless the ACO confirms that the FPRA is no longer in effect.

- Has anything changed that might significantly affect the rates?

Substantial changes in business volume, acquisition or sale of assets, automation, or other changes can affect indirect cost rates. Such changes could be reasons for requesting a new audit or overturning an FPRA. Analysis of direct and indirect cost forward pricing rates will be considered in more detail later in the text.

4.1.3 Examining Reviews Of Offeror’s Systems

Common Government Contractor System Reviews. At major contractor locations, the Government typically conducts a variety of system level reviews. The ultimate purpose of all these reviews is to assure that contractor management systems are capable of providing an acceptable product, on time, and at a reasonable cost. Cost risk to both the Government and contractor increases if the contractor’s systems are inadequate. Common system level reviews include:

- Contractor Purchasing System Reviews;
- Contractor Accounting System Reviews; and
- Contractor Estimating System Reviews.

Contractor Purchasing System Review (FAR Subpart 44.3 and FAR 15.404-3(a)). Subcontract and material costs typically comprise more than half of most prime contract cost proposals. The Contractor Purchasing System Review (CPSR) is a periodic Government review of contractor's purchasing records, policies, and procedures. The purpose of this review is to ensure that the Government's interests are being adequately protected by the contractor.

Based on the CPSR results, the cognizant ACO may grant, withhold, or withdraw contractor purchasing system approval.

- If the system is approved, the majority of purchase orders (except high dollar cost-reimbursement orders, etc.) can be placed by the prime contractor without first obtaining Government consent.
- If system approval is withheld or withdrawn, the contractor must obtain Government consent before issuing all but the smallest fixed-price purchase orders.

As a minimum, you should consider the following questions concerning a contractor’s CPSR results:

- Is the offeror's purchasing system currently approved by the Government?

One item emphasized in CPSRs is the contractor's subcontract pricing policies and procedures. A disapproved contractor purchasing system is a red flag that the subcontract/material portion of a cost proposal may be overpriced. However, purchasing system approval does not relieve you of your pricing responsibility. Regardless of system approval or lack of approval, you are still responsible for determining if proposed prices are fair and reasonable.

- How might purchasing system weaknesses affect contract pricing?

If you can identify purchasing system pricing weaknesses, you can target those elements of the proposal for more intensive cost analysis.

Contractor Accounting System Review (FAR 15.404-2(c)(4), FAR 30.202-7, and DCAM 9-302). When the contract price is to be negotiated using cost analysis, the contractor's cost accounting system is usually a major source of offeror cost information. The objective of an accounting system review is to determine whether the firm's accounting system and related practices for accumulating costs are adequate to support contracting decisions requiring accurate, complete, and current cost information.

The cognizant auditor, the Government representative with general access to the firm's accounting and financial records, has primary responsibility for conducting the on-site review. In reviewing accounting system adequacy, the auditor considers the results of prior audits, current findings, and other available information.

When applicable, the auditor’s review must consider whether the firm has submitted an adequate Disclosure Statement and whether actual accounting practices comply with the Cost Accounting Standards Board Cost Accounting Standards (CAS) and the firm’s Disclosure Statement. If the auditor reports that the firm has not submitted an adequate Disclosure Statement or that actual accounting practices do not comply, the ACO must evaluate the report and take appropriate action. The ACO makes the final determination on the adequacy of the firm's disclosure and compliance.
As a minimum, you should consider the following questions concerning the results of any accounting system review:

- Has the cognizant auditor reported that the offeror's cost accounting system is adequate for contract pricing?

If the cognizant auditor finds that the firm's accounting system is adequate for contract pricing, you can assume the system has sufficient controls to provide valid and reliable information for contract pricing. It does not mean that all judgments applied in estimate development are reasonable.

- Has the cognizant auditor reported that the offeror's cost accounting system is not adequate for contract pricing?

If the auditor finds that the offeror's cost accounting system is not adequate for contract pricing, carefully examine the reasons for the auditor's finding and the effect that the system failure will have on contract pricing.

- If the finding results from a general system failure, you should not rely on accounting information provided for contract pricing. You will need to find another method of obtaining adequate cost information or another basis for contract pricing.

- If the finding results from a system failure in a particular area, you must consider the effect on the contract action you are pricing. For example, in an accounting system which provides for tracking direct labor costs by production lot, inadequate controls over job lot cutoffs may result in inaccurate lot cost data. This type of failure could produce inequitable results when estimating manufacturing direct labor hours. However, if your contract action does not require manufacturing labor, this system failure should have no effect on your cost analysis.

- If the firm is subject to full CAS coverage, has the firm submitted an adequate Disclosure Statement and is the firm complying with that disclosure?

A CAS-covered contractor's accounting system cannot be considered adequate, if the firm has not submitted an adequate Disclosure Statement or is not complying with the disclosure or cost accounting standards. In some cases, the ACO may have not yet made a final determination on adequacy or compliance. The auditor, the contractor, and the ACO may all have different positions. You must consider the effect of any identified deficiency on the contract action you are pricing.

Contractor Estimating System Review (FAR 15.407-5 and DFARS 215.407-5-70). An effective cost estimating system is essential for any firm to consistently provide adequate and reliable cost estimates. To assure estimating system quality, many large contractors are periodically subjected to Contractor Estimating System Reviews (CESRs).

A CESR is normally an audit/contract administration team effort led by a representative from the cognizant audit activity. The objectives of a CESR are to reduce the time and scope of reviews of individual proposals, to expedite the negotiation process, and to increase the reliability of the offeror's cost proposals. A review is an excellent source of information on estimating system weaknesses and problem areas. In addition to the review report itself, pertinent findings are typically referenced in individual proposal audits.

As a minimum, you should consider the following questions concerning any CESR results:

- Is the offeror's cost estimating system currently approved by the Government?

ACO estimating system approval means that the system has the controls to consistently produce adequate estimates. A disapproved system is a red flag indicating that the firm's estimating system does not consistently provide adequate proposals. Normally, proposals from a firm with a disapproved system should be subjected to closer scrutiny, particularly closer scrutiny by audit professionals.

- What estimating system deficiencies were noted during the review, and how might those deficiencies affect this proposal?

Indicators of a potentially deficient estimating system include:

- Failure to ensure that historical experience is available to, and utilized by, cost estimators, where appropriate;

- Continuing failure to analyze material costs or failure to perform subcontractor cost reviews as required;
• Consistent absence of analytical support for significant amounts of proposed cost;
• Excessive reliance on individual personal judgment where historical experience or commonly used standards are available;
• Recurring defective pricing findings within the same cost element(s);
• Failure to integrate relevant parts of other management systems (e.g., production control or cost accounting) with the estimating system, resulting in an impaired ability to generate reliable cost estimates; and
• Failure to provide established policies, procedures, and practices to persons responsible for preparing and supporting estimates.

4.1.4 Examining Industry Cost Estimating Guides And Standards

*Industry Estimating Guides/Standards.* In some industries (e.g., construction), there are cost estimating guides and standards that are generally accepted by the industry. Once you identify the tasks required to complete the contract, these guides and standards provide excellent information on the related cost. For other industries, there are various sources of information that you can use as benchmarks in your cost analysis. The table below identifies sources of data that may prove useful in cost analysis:

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<td>Santa Monica, CA 90407-2138</td>
<td>Automated Cost Estimating Integrating Tools (ACEIT) estimating system and database for estimating the cost of electronic warfare systems</td>
</tr>
<tr>
<td>Electronics Systems Center (ESC)</td>
<td>Aircraft Avionics</td>
</tr>
<tr>
<td>Hanscom AFB, MA</td>
<td>Aircraft Avionics</td>
</tr>
<tr>
<td>Organization</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Space and Missile Systems Center (SMC/FMC) Los Angeles AFB, CA</td>
<td>Software Database (SWDB), of historical data on software development and maintenance</td>
</tr>
<tr>
<td>U.S. Army Cost and Economic Analysis Center 5611 Columbia Pike Falls Church, VA 22410-5050</td>
<td>Installation Support Standard Service Costing (SSC) service and performance data from on-going Army initiatives combined and statistical techniques for use in cost estimating</td>
</tr>
<tr>
<td>Naval Center for Cost Analysis 1000 NAVY PENTAGON ROOM 4C449 (NCCA) WASHINGTON DC 20350-1000 <a href="http://www.ncca.navy.mil/">http://www.ncca.navy.mil/</a></td>
<td>NCAA's mission is to, &quot;To guide, direct and strengthen cost analysis within the Department of the Navy; to ensure the preparation of credible cost estimates of the resources required to develop, procure and operate military systems and forces in support of planning, programming, budgeting and acquisition management; and to perform such other functions and tasks as may be directed by higher authority.&quot; The site contains a variety of resources including publications, manuals and cost estimating tools.</td>
</tr>
<tr>
<td>Naval Air Systems Command 1421 Jefferson Davis Highway, Arlington, VA 22243-1000</td>
<td>Aircraft Modification Naval Aviation Modification Model (NAMM) database</td>
</tr>
<tr>
<td>Air Force Cost Analysis Agency 1111 Jefferson Davis Highway, Suite 403 Arlington, VA 22202</td>
<td>Aircraft Aircraft Cost Handbook, a single source of consistent and comprehensive cost and related information describing the development and production phases of several fixed-wing, rotor-wing, and aircraft engine programs</td>
</tr>
<tr>
<td></td>
<td>Aircraft Multi-Aircraft Cost Data &amp; Retrieval (MACDAR) database of contractor labor hours and material costs at the lowest levels available</td>
</tr>
<tr>
<td></td>
<td>Avionics Database of cost, programmatic, and technical avionics data</td>
</tr>
<tr>
<td></td>
<td>Spacecraft Cost estimating relationships (CERs) for estimating development and production costs for the space portion of satellite programs</td>
</tr>
<tr>
<td></td>
<td>Launch Vehicles Launch Vehicle Cost Model (LVCM), cost estimating relationships (CERs) to estimate liquid stage structures; liquid fuel engine; power system; avionics/</td>
</tr>
</tbody>
</table>
4.2 Requesting Acquisition Team Assistance

Types of Cost Analysis Assistance (FAR 1.102-3, FAR 1.102-4, and FAR 15.404-2). The offeror’s cost proposal is the offeror’s estimate of reasonable contract costs and profit. This estimate is normally based on a combination of technical information, accounting information, and judgment. Therefore, you will normally need technical and accounting assistance from other members of the Government Acquisition Team as you evaluate these estimates.

Identify the team assistance necessary for proposal analysis as early as possible in the acquisition process. Early communications with team members will assist you in determining the specific areas in which you need assistance, the extent of assistance required, a realistic analysis schedule, and information requirements for cost analysis.

- **Technical Analysis Assistance.** A technical analysis is an examination and evaluation to determine and report on the need for and reasonableness (assuming reasonable economy and efficiency) of the resources proposed by the offeror to complete the contract.
  - To be effective, the personnel performing the technical analysis must have the necessary specialized knowledge, skills, experience, or capability in:
    - Engineering,
- Science, or
- Management of the type of effort required to complete the contract.
- While any area of the proposal may require technical analysis, the following are some of the areas typically evaluated:
  - Material quantities;
  - Labor hours;
  - Special tooling and test equipment types and quantities;
  - Unique facility requirements; and
  - Associated factors set forth in a proposal.

- **Audit Analysis Assistance (DCAM 1-104.2).** Contract audits are performed by Government auditors who have training and experience in analyzing accounting records and information from related offeror management systems. These auditors are the only Government personnel with general access to the contractor's books and financial records. The contract audit objective is to assure that the contractor has adequate controls to prevent or avoid wasteful, careless, or inefficient practices. Areas of particular audit concern include the:
  - Adequacy of the contractor's policies, procedures, practices, and internal controls relating to accounting, and procurement;
  - Adequacy of the contractor's management policies and procedures affecting costs;
  - Adequacy and reasonableness of the contractor's cost representations;
  - Adequacy and reliability of the contractor's records for Government-owned property;
  - Financial capabilities of the contractor; and
  - Appropriateness of contractual provisions having accounting or financial significance.

**Sources of Technical Analysis Assistance (FAR 15.404-2).** Members of the Government Acquisition Team who are familiar with the offeror and contract technical requirements can usually perform the best technical analysis of an offeror's proposal. In some cases, you may need to request more than one technical analysis, because no one person or office is familiar with all technical aspects of the proposal. Typically, technical analysis assistance may come from one or both of the following sources:

- **In-House Technical Assistance.** In most contracting situations, in-house members of the Government Acquisition Team will be your primary source for technical analysis assistance, because in-house personnel are most familiar with contract requirements and any unique aspects of the acquisition environment.

- **Field Pricing Assistance.** Field pricing assistance may be available from field contract administration activities, such as those operated by the Defense Contract Management Agency (DCMA). Personnel in these activities may work in the contractor's facility, or travel from plant to plant in a particular geographic area. In either case, they can provide valuable insights based on their knowledge of contractor facilities and operations. Personnel available to provide field pricing technical assistance typically include, but are not limited to the following:
  - Administrative contracting officers;
  - Price analysts;
  - Engineers;
  - Small business specialists; and
  - Legal counsel.

**Sources of Audit Assistance (FAR 15.404-2).** Available sources of Government audit assistance differ from agency to agency. Consult agency procedures to determine which of the following types of audit
assistance are available to you:

- **In-House Assistance.** Your contracting activity may have in-house financial management personnel assigned to act as contract auditors.

- **Inspector General Assistance.** Your Agency Inspector General office may perform contract audits as well as internal Government audits.

- **Field Pricing Assistance.** You may have access to auditors assigned to contractor plants or specific geographic regions. The Defense Contract Audit Agency (DCAA) is the primary field pricing audit activity servicing the DoD and most other agencies. In fact, most Government contract audits are performed by DCAA personnel.

**Assistance for Prime Contract Proposal Analysis** (FAR 15.404-2 and DFARS 215.404-2). For each proposal, you must determine what type of Government Acquisition Team assistance you will need for your cost analysis.

- **In-House Assistance.** In most contracting situations, in-house members of the Government Acquisition Team will be your primary source for technical analysis assistance. Consider your specific analysis needs before contacting individuals or organizations for assistance.

- **Field Pricing Assistance.** Always consider the risk to the Government and agency requirements before requesting field pricing assistance.
  - In higher risk situations, you will likely need field pricing assistance. For example, the DoD recommends that contracting officer consider requesting field pricing assistance for:
    - Fixed-price proposals exceeding the cost or pricing data threshold;
    - Cost-reimbursement proposals exceeding the cost or pricing data threshold from offerors with significant estimating system deficiencies; or
    - Cost-reimbursement proposals exceeding $10 million from offerors without significant estimating deficiencies.
  - In lower risk situations, you should normally not need field pricing assistance. For example, the DoD recommends that contracting officers not request field pricing assistance for proposed contracts or modifications in an amount less than that specified above, unless a reasonable pricing result cannot be established because of:
    - A lack of knowledge of the particular offeror; or
    - Sensitive conditions (e.g., a change in, or unusual problems with, an offeror's internal systems).

**Assistance for Subcontract Proposal Analysis** (FAR 15.404-2 and FAR 15.404-3). The prime contractor or higher-tier subcontractor is responsible for:

- Conducting appropriate cost or price analyses to establish the reasonableness of proposed subcontract prices; and

- Including the results of those analyses in the prime contract price proposal.

- Submitting subcontractor cost or pricing data as part of its own cost or pricing data where the subcontractor cost or pricing data is the lower of either:
  - $11.5M or more; or
  - Both more than the cost or pricing data threshold and more than 10% of the prime's proposed price unless the contracting officer believes such a submission is unnecessary.

You should only request audit or technical field pricing assistance to analyze a subcontract proposal if you believe that such assistance will serve a valid Government interest (e.g., determining total price reasonableness). Give special consideration to requesting subcontract audit or field pricing assistance when one or more of the following situations exist (DFARS 215.404-3(a)):

- The business relationship between the prime contractor and the subcontractor is not conducive to
independence and objectivity;

- The prime contractor is a sole source and the subcontract cost represents a substantial part of the proposed contract cost;
- The prime contractor has been denied access to the subcontractor's records;
- The contracting officer determines that factors (e.g., proposed subcontract dollar value) make audit or field pricing assistance critical to a fully detailed prime contract proposal analysis;
- The contractor or higher-tier subcontractor has been cited for having significant estimating system deficiencies in the area of subcontract pricing, especially a failure to perform:
  - Adequate subcontract cost analyses or
  - Timely subcontract analyses prior to negotiation of the prime contract with the Government; or
- A lower-tier subcontractor has been cited as having significant estimating system deficiencies.

**Tailor Assistance Requests to Analysis Needs (FAR 15.404-2).** Identify analysis needs before requesting analysis assistance. Remember that early communications with Government Acquisition Team members will assist you in determining the specific areas for which assistance is needed, the extent of assistance required, a realistic analysis schedule, and information requirements for cost analysis.

If current and reliable technical or audit information is already available, you may not need assistance or you may be able to limit your assistance request to an informal verification that available information is still current. For example:

- If there is already information available from an existing audit (completed within the last 12 months), **never** request a separate preaward audit of indirect costs **unless** the contracting officer considers the information already available inadequate for determining the reasonableness of proposed indirect costs.
- If there was an indirect cost audit within the last 12 months but no forward pricing rate agreement, contact the cognizant auditor/ACO to obtain information on the current Government rate recommendations.
- If you have a reliable record of the offeror’s current forward pricing rate agreement for direct labor rates, there is no reason to request a direct labor rate analysis from the cognizant auditor or ACO.
- If the offeror’s proposal states that the firm has proposed indirect cost forward pricing rates in accordance with an established forward pricing rate agreement, verify that statement with the responsible ACO. If the ACO verifies that the proposed rates are part of a forward pricing rate agreement, no further indirect cost rate analysis is required. However, you should advise the ACO if you believe that rates for all contracts will be affected by your proposed contract.
- If you have a reliable record of recent production costs for an identical item, do not request an audit of production cost history.
- If the Government and the contractor have established pricing formulas, determine whether changes in production methods or market conditions will affect those formulas. If not, further technical or audit analysis should not be necessary. If conditions have changed, request analyses to consider the effect of those changes.
- If the offeror uses standard component prices, determine whether changes in production methods or market conditions will affect those prices. If not, further audit analysis of material prices for those components should not be necessary. If conditions have changed, request an audit to consider the effect of those changes.

**Oral Requests for Assistance (FAR 15.404-2(b)(1)).** You are encouraged to make face-to-face or telephonic requests for pricing assistance whenever practical. Such requests are particularly appropriate when you only need to verify or obtain existing information. However:

- All requests for analysis assistance must consider agency and buying office requirements.
When requesting assistance from another activity, you should first contact the assisting activity to determine what means of communications are acceptable for assistance requests.

Record all oral requests in the contract file. The record should include such information as the request date, person contacted, and the assistance requested.

Written Requests for Proposal Analysis Assistance (FAR 15.404-2). Requests for in-depth proposal analysis should normally be made in writing. When practical, meet with the analyst to deliver the request. When distance or other factors make it impractical to carry the request to the analyst, use E-mail or FAX to transmit short requests without attachments. Use mail or expedited shipment for more voluminous requests.

As you prepare each request, ensure that you:

- Describe the extent of assistance needed.
- Identify the specific areas for which input is required.
- Include the information necessary for the requested analysis or assure that it is provided to the auditor or technical analyst.
  - A request for technical analysis:
    - Should include a copy of all technical information submitted by the offeror on the cost(s) involved.
    - Should normally not include dollar amounts. Technical personnel are not normally the best sources of labor or overhead rate analysis. Including such information in your request may cloud their analysis of technical issues.
  - A request for audit assistance should include a:
    - Complete copy of the offeror's cost proposal;
    - Copy of any technical analyses already completed; and
    - A request that the auditor concurrently forward the audit report to the requesting contracting officer and the ACO if an audit and technical analysis are both requested.
- Assign a realistic deadline for receipt of any requested report. An unrealistically short deadline may reduce analysis quality. A poor report may make it impossible to determine whether the proposed price is fair and reasonable.
- Encourage analysts to submit all but the briefest responses in writing. However, you should also encourage analysts to use E-mail or FAX to transmit short responses without attachments. More voluminous responses should be submitted by mail or expedited shipment.

Retain a copy of the request in the contract file.

Requests for Subcontract Proposal Analysis Assistance (FAR 15.404-2 and DFARS 215.404-2(c)). When you request analysis of a subcontract proposal, your request should include a copy of the following (when available):

- Any review prepared by the prime contractor or higher-tier subcontractor;
- Relevant parts of the subcontractor's proposal;
- Cost or pricing data or information other than cost or pricing data provided by the subcontractor; and
- The results of the prime contractor's cost or price analysis.

Assure that you follow agency procedures in requesting any subcontract analysis. For example, DoD contracting officers should notify the appropriate contract administration activities when extensive, special, or expedited field pricing assistance will be needed to review and evaluate a subcontractor's proposal.

As you prepare your request, assure that all personnel involved understand that you must obtain the subcontractor's consent before the Government can provide the results of a Government analysis of a
subcontract proposal to the prime contractor or higher-tier subcontractor. If the subcontractor withholds consent, you can only provide information on a range of unacceptable costs for each cost element and you must provide that range in a way that prevents disclosure of subcontractor proprietary information (DFARS 215.404-3(a)(iii)).

Requests for Equitable Adjustment Analysis Assistance (FAR 15.404-2(a)(4) and FAR 43.204(b)(5)). When preparing a written request for field pricing assistance for an equitable adjustment, provide a list of any significant contract events which may aid in the analysis. This list should include the:

- Date and dollar amount of contract award and/or modification;
- Date of submission of initial contract proposal and dollar amount;
- Date of alleged delays or disruptions;
- Performance dates as scheduled at date of award and/or modification;
- Actual performance dates;
- Date entitlement to an equitable adjustment was determined or a contracting officer decision was rendered if applicable;
- Date of certification of the request for adjustment if certification is required; and
- Dates of any pertinent Government actions or other key events during contract performance which may have an impact on the contractor’s request for equitable adjustment.

4.3 Evaluating Acquisition Team Assistance

Oral Responses (FAR 15.404-2(b) and FAR 15.404-2(d)). Most technical and audit responses are written. However, an oral response may be particularly appropriate when:

- The analyst is only verifying information already available to the contracting officer (e.g., forward pricing rates); or
- Effective and timely analysis is threatened by a lack of information. For example, the cognizant auditor or ACO, as appropriate, should contact the contracting officer if proposal deficiencies are so great as to preclude review or audit or if the offeror or contractor denies the auditor access to any records considered essential to the conduct of a satisfactory review or audit. Oral notifications must be confirmed promptly in writing including a description of deficient or denied data or records.

Assure that each oral response is clearly recorded in the contract file, including (as a minimum) the date, person providing the information, and the information provided.

Written Reports (FAR 15.404-2(b) and DCAM 10-304.8). Encourage analysts to submit all but the briefest responses in writing. However, you should encourage analysts to use e-mail or fax to transmit short responses without attachments. More voluminous responses should be submitted by mail or expedited shipment.

Retain a copy of any written response in the contract file and consider the results as you prepare the Government pricing position.

- **Technical Reports.** Technical reports typically accept an offeror’s proposal or present an alternative position based on a different analysis of the available facts. Differences between the proposed amount and the recommended amount are generally identified as “exceptions.” These exceptions may result from a variety of reasons including: a different approach to estimate development, different estimating assumptions, or the use of additional facts not used by the offeror.

- **Audit Reports.** Audit reports on cost estimates are based on a similar analysis approach. However, audit reports typically assign exceptions to the offeror’s proposal to one of three categories:
  - **Questioned costs.** These are costs on which audit action has been completed and which are not considered as acceptable as a contract cost. For example, items under the provisions of a pertinent law, regulation, or contract which are unallowable cannot be included in the contract price.
Unsupported costs. These are costs which the auditor cannot evaluate as allowable or unallowable, because there is not enough information for analysis. For example, auditors commonly classify oral vendor quotes as unsupported, because there is no factual evidence to support the amount quoted.

Unresolved Costs. These are costs that have not yet been evaluated. Typically costs are associated with proposals from subcontractors or transfers from other operating units of the firm. The auditor may have requested an assist audit, but not received the results from the auditor responsible for the assist audit.

Identify Report Strengths and Weaknesses. As you evaluate each analysis report, use the following questions to identify analysis strengths and weaknesses:

- Does the report answer the questions in your request?

If your assistance request identified specific proposal areas requiring analysis, the analysis report should address each area identified.

- Does the report explain the evaluator's position in clear language that you can understand?

You are responsible for integrating the proposal analysis into the overall Government position. However, you are not responsible for rewriting the technical or audit report. Each report should clearly communicate its recommendations and stand on its own.

- Does the report support its conclusions?

The "looks good to me" or "based on my experience and judgment" reports are of little use in negotiations. Each conclusion, whether it agrees with or disputes the offeror's proposal, should be accompanied by an understandable rationale. A good evaluation will tell you what was analyzed and how it was analyzed.

Identify Inconsistencies Within Each Report. Analysis reports may contain inconsistencies, (i.e., one part of an analysis report may accept the offeror's estimating approach, while another part of the same report rejects the same approach in similar circumstances). An analysis report with such inconsistencies will likely be of limited value to you as you prepare your pricing objectives. Identify any analysis inconsistencies, so that you can resolve them.

As you evaluate analysis report(s), use the following questions to identify inconsistencies within each report:

- Did a single analyst provide inconsistent analysis?

An analyst may only report the results from using a particular analysis technique when the resulting cost estimate is lower than that proposed by the offeror. Analysis results that result in an estimate higher than those proposed by the offeror are not reported. This should not happen. If the technique produces estimates that are more accurate than the estimates submitted by the offeror, the results should be reported regardless of whether the estimated cost is higher or lower than the costs proposed. Remember, your objective is to obtain a fair and reasonable price.

- Did multiple analysts working on the same report provide inconsistent analyses of similar elements of cost?

Different analysts involved in preparing the same report may take different positions on the use of a particular estimating technique or estimating assumption. This is particularly likely when there is inadequate coordination between multiple analysts.

Identify Inconsistencies Between Analyses. As you review different analyses of the same proposal, you may find apparent inconsistencies. One report accepts a cost estimate while another report takes exception to all or part of the same estimate. Such inconsistencies typically occur when different analysts have different professional perspectives or different guidelines for analysis.

- Are there any inconsistencies between the technical and audit analyses?

An auditor might take exception to an offeror's round-table cost estimate accepted by a technical analyst. Why? Auditors base their analyses on facts and projections made from those facts. A round-table estimate may be based on judgment with little or no factual support. As a result, the auditor takes exception to the cost as unsupported. On the other hand, a technical analyst may look at the estimating situation and ask, "Does the estimate make sense, in this situation?" If it does, the technical analyst may
accept the estimate. Same estimate, different analysis results.

- Are there any inconsistencies between in-house and field analyses?

In-house and field personnel may have different perspectives concerning the cost analysis. In-house personnel may be more familiar with the offeror's estimating and operating procedures. Resolve Apparent Weaknesses and Inconsistencies (FAR 15.406-1(a)). As you review report results, reconcile any inconsistencies that you identify. Technical and audit reports should provide key inputs to your cost analysis. Report weaknesses and inconsistencies; bring the value of these reports into question.

You may be able to resolve weaknesses and inconsistencies without assistance from the report writer. More likely, you will need to contact the report writer for support.

- Minor concerns. You can usually obtain minor clarification or additional support by contacting the report writer informally. This form of contact has the advantage of direct communication without barriers of protocol.

- Major concerns. If you have major concerns about the accuracy or value of a particular written report, you should make a written request for clarification. A written request provides documentation of your concern and indicates the need for a written response.

Check Reality. Keep the results of all analyses in perspective. Don't just consider the numbers. Use your own common sense.

For example: Material cost per unit has been increasing over the five years that the offeror has produced similar units. The Government analyst based a material cost recommendation on the average material unit price over the five years of production. In developing this recommendation, the analyst averaged the cheaper units from five years ago with the more expensive units used in recent production. The history is valid, the calculations are correct, but the recommendation makes no sense unless prices are expected to decline for some reason.

- 5.0 Chapter Introduction

- 5.1 Identifying The Offeror's Planning Assumptions
  - 5.1.1 Identifying Basic Planning Assumptions
  - 5.1.2 Analyzing Specific Assumptions
  - 5.1.3 Determining Proper Contingency Cost Treatment

- 5.2 Applying Should-Cost Principles In Objective
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- 5.3 Recognizing Cost Risk
  - 5.3.1 Identifying Principal Sources Of Cost Risk
  - 5.3.2 Assessing The Level Of Risk
  - 5.3.3 Using Contract Type To Mitigate Risk
  - 5.3.4 Using Clear Technical Requirements To Mitigate Risk
  - 5.3.5 Using Government Furnished Property To Mitigate Risk
  - 5.3.6 Using Contract Terms And Conditions To Mitigate Risk

https://acc.dau.mil/CommunityBrowser.aspx?id=379510 - 5.3.6

5.0 Chapter Introduction
As you perform your cost analysis, develop Government pricing objectives based on what the price of the contract should be if the firm operates efficiently and effectively. Scrutinize the offeror's assumptions and related work design, considering the factors identified in this chapter.

Proposal Structure (FAR Table 15-2). To understand and evaluate work design, you first need to break
total cost into its basic elements. The proposal should include a description of the structure used in preparing the proposal. This description should resemble a pyramid, with total contract cost at the top. Each lower level of the pyramid should further break total cost into its component costs until the foundation for proposal development is reached -- the work package.

![Diagram of Work Package Pyramid]

**Work Package.** A proposal work package should:
- Serve as the foundation for proposal development;
- Describe a detailed short-term task that can be identified and controlled by the contractor in assigning contract effort;
- Distinguish the task to be performed from the work identified in all other work packages;
- Assign responsibility for work package completion to a single operating organization of the firm;
- Identify objective start and completion events which:
  - Are associated with physical accomplishments;
  - Can be scheduled to calendar dates; and
  - Can be objectively measured;
- Include a budget expressed in terms of dollars, work hours, or other measurable units.
- Minimize work in progress.

**Work Breakdown Structure (MIL-HDBK 881).** The request for proposal (RFP) for a large complex system may require the offeror to provide cost information based on a Work Breakdown Structure (WBS) identified in the solicitation. This concept can be used in acquiring any large system, but it is most commonly used in acquiring large DoD systems.

The WBS is a product-oriented family-tree division of hardware, software, services, and other work required to complete the contract. It organizes, defines, and graphically displays contract requirements and the work required to meet those requirements. The multiple levels of the WBS "explode" the work required down to identifiable work packages. In a common WBS:
- Level 1 is the entire system;
- Level 2 identifies the major elements of Level 1;
- Level 3 identifies the major elements of Level 2;
- Level 4 and later levels provide increasingly detailed information.

The number of levels of detail that you require in the solicitation, should depend on the complexity of the system and the perceived need for in-depth visibility.

The following table provides an example of a WBS structure for a missile system. For other large systems, the elements will change, but the concept will remain the same.
<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missile System</td>
<td>Air Vehicle</td>
<td>Vehicle Integration and Assembly; Propulsion Vehicle Stages (each stage included in system design); Guidance and Control Equipment; Airborne Test Equipment; Auxiliary Equipment</td>
</tr>
<tr>
<td></td>
<td>Command and Launch Equipment</td>
<td>Integration and Assembly Surveillance, Identification, and Tracking Sensors; Launch and Guidance Control Communications Data Processing; Launcher Equipment; Auxiliary Equipment</td>
</tr>
<tr>
<td>Training</td>
<td>Equipment; Services; Facilities;</td>
<td></td>
</tr>
<tr>
<td>Peculiar Support Equipment</td>
<td>Organizational Level; Intermediate Level; Depot Level</td>
<td></td>
</tr>
<tr>
<td>System Test and Evaluation</td>
<td>Development of Test and Evaluation; Operational Test and Evaluation; Mock-ups; Test and Evaluation Support; Test Facilities</td>
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</tr>
<tr>
<td>Systems/Project Management</td>
<td>Systems Engineering; Project Management</td>
<td></td>
</tr>
<tr>
<td>Data</td>
<td>Technical; Publications; Engineering Data; Management Data; Support Data; Data Depository</td>
<td></td>
</tr>
<tr>
<td>Operational/Site Activation</td>
<td>Contractor Technical Support; Site Construction; Site/Ship/Vehicle Conversion; On-site System Assembly, Installation, and Checkout</td>
<td></td>
</tr>
<tr>
<td>Common Support Equipment</td>
<td>Organizational Level; Intermediate Level; Depot Level</td>
<td></td>
</tr>
<tr>
<td>Industrial Facilities</td>
<td>Construction; Conversion/Expansion</td>
<td></td>
</tr>
<tr>
<td>Initial Spares and Repair Parts</td>
<td>Identified Spares Allowance</td>
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</tr>
</tbody>
</table>
5.1 Identifying The Offeror’s Planning Assumptions
This section will identify points to consider as you identify and analyze offeror planning assumptions.

- 5.1.1 - Identifying Basic Planning Assumptions
- 5.1.2 - Analyzing Specific Assumptions
- 5.1.3 - Determining Proper Contingency Cost Treatment


5.1.1 Identifying Basic Planning Assumptions
Basic Planning Assumptions. Each proposal cost estimate is based on certain planning assumptions. Most good proposals specifically identify key assumptions at the beginning of the proposal. Whether the assumptions are identified or not, they exist. Because these assumptions are basic to cost estimate development, you should begin your cost analysis by identifying the offeror's assumptions.

You should be able to classify each of the offeror's assumptions into one of two basic perceptions of the future:

- The future will be the same as the past.
  
  If the offeror assumes that the future will be the same as the past, the proposal should explain the reason for that belief. Then the estimator should rely on data gathered from past performance in estimating future contract costs.  
  
  For example: An offeror is estimating the cost for a contract to manufacture 100 units of Product A. The firm has recently completed a contract to produce 100 units of Product A. The recent contract required 125 units of a key component. Based on that assumption, they would estimate that 125 units of that key component will be required to complete the proposed contract.

- The future will be different from the past.
  
  If the offeror assumes that the future will be different than the past, the offeror should rely less on historical data in proposal development. The offeror may estimate contract costs using a factor to adjust historical data or the offeror may rely on an estimating technique that is not based on historical data. In either case, the proposal should explain why the estimate provided is more reasonable than an estimate based on historical data.  
  
  For example: An offeror is estimating the cost for a contract to manufacture 200 units of Product B. The firm recently completed a contract to produce 200 units of Product B. The recent contract required 40,000 direct labor hours. However, the offeror believes that experience gained on the completed contract will make labor more efficient on the proposed contract. The estimator might adjust the historical labor hours using a quantitative technique (e.g., an improvement curve). Alternatively, the estimator might use an entirely different basis for estimate development (e.g., an industry labor standard).

Identify and Evaluate Planning Assumptions. As you begin your cost analysis:

- Identify the planning assumptions used by the offeror in proposal development.

The offeror's proposal may have a single overall statement of the assumptions used in planning. However, if the assumptions are not presented in one place, you must carefully review the proposal to find them. Often individual estimates will include statements about the assumptions and factors used in preparing that estimate.

- Develop a position on whether assumptions are realistic and consistent, and how they affect the proposal.

Request technical assistance in developing your position on technical assumptions (e.g., labor efficiency) and audit assistance in developing your position on financial assumptions (e.g., labor rate increases). For each assumption, you should ask specific questions based on the following:

- Is the proposal assumption realistic?
- Is the assumption consistent with the rest of the proposal?
• How does the proposal assumption affect contract cost?

5.1.2 Analyzing Specific Assumptions
Common Assumptions, Cost proposals typically involve many assumptions. The details of these assumptions will vary depending on the acquisition situation. However, you will find that most assumptions will involve the effect of one of the following on contract performance:
• General performance problems;
• Technology changes;
• Interruptions and shortages; or
• Inflation/deflation.

Because assumptions involving these topics are so common, you must be prepared to identify and evaluate them in your analysis.

Identifying Assumptions Regarding General Performance Problems. When calculating the estimated cost of a proposal, an offeror will try to anticipate problems in the project that will affect contract cost. Problems may be related to any of the wide variety of factors affecting contract performance (e.g., technical, managerial, financial, environmental, etc.). The proposal should estimate the likelihood that the problem will occur and the cost involved. As you develop your pricing position, you must evaluate the reasonableness of the offeror’s proposal and develop your own estimate of contract costs.

For example: Consider the assumptions and associated costs that an offeror might include in a proposal to produce rocket fuel using highly toxic and explosive chemicals. The proposal might include assumptions related to:
• Locating a plant site;
• Higher wages and employee benefit costs due to the danger associated with an untested and explosive product;
• Meeting Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) regulatory requirements;
• Waste disposal; or
• Hazardous product storage.

Evaluating Assumptions Regarding General Performance Problems. When analyzing the offeror’s assumption of an anticipated problem, answer the following questions:
• Is the proposal assumption realistic?
If answering this question is beyond your technical expertise, request a technical analysis. In your request for technical analysis assistance, specifically ask for an assessment of the likelihood of the problem occurring and the probable effect of the problem on contract performance.
• Is the assumption consistent with the rest of the proposal?
Sometimes a proposal will project a problem in one area of contract performance, but not in other areas that should be affected by the same problem. With assistance from technical experts, identify and resolve any apparent inconsistencies.
• How much should it reasonably cost to handle the problem?
Cost estimates should consider the likelihood that the problem will occur and the cost to resolve the problem if it does occur. Advice from technical personnel is generally invaluable in estimating a reasonable cost associated with a potential problem.

Identifying Assumptions Regarding Technological Changes. Technological change can affect the product, the production process, or both. In this time of rapid technological advancement and the often long lead times for awarding Government contracts, an offeror has to anticipate the effect technological change will have on contract performance and cost. The contract itself may require the offeror to assume the risk associated with developing new state-of-the-art technology.
In any case, the offeror must assess the likelihood of technological change and the effect of the change on contract cost. Assuming that an anticipated technological advancement will reduce contract costs may be risky. After all, many advancements that appear to be just around the corner do not actually happen, or if they occur do not bring the expected benefits.

As you develop your pricing position, you must evaluate the reasonableness of the offeror's proposal and develop your own estimate of contract costs. You cannot allow an offeror to ignore expected advancements that will lower contract cost, and you cannot automatically assume that every contract requiring an advance in the state-of-the-art will require an awesome effort with costs to match.

For example: An offeror is preparing a proposal to produce a new control subsystem that will replace and improve the existing control subsystem in an automated material handling system. The existing control subsystem has had significant problems because current technology does not permit the production of equipment that meets required reliability and maintainability standards. In preparing the proposal, the offeror should consider the:

- Costs associated with each method that might be used to advance the product state-of-the-art to meet Government requirements and the probability that method will succeed; and
- Costs associated with each method that might be used to advance the production process state-of-the-art to produce the new product and the probability that method will succeed.

Evaluating Assumptions Regarding Technological Changes. When analyzing the effect of anticipated technological changes on contract cost, consider the following questions:

- Are proposal assumptions about technological change realistic?

If answering this question is beyond your technical expertise, request a technical analysis. Remember that the offeror may have been overly optimistic or overly pessimistic in developing assumptions about technological change.

- Is the assumption consistent with the rest of the proposal?

Look for inconsistencies in the proposal assumptions about technological change. It is not uncommon for one part of a proposal to state that technology already exists, while another indicates that substantial effort will be required to obtain the same technology.

- What will be the cost/benefit of the indicated technological change to the proposed contract?

There may be ways of completing the contract that do not require technological change. Existing products and methods may be quite satisfactory. The required technology may already be available. Identifying Assumptions Regarding Interruptions and Shortages. There are many factors that might affect a contractor's ability to complete the contract on schedule, including:

- Reasonable interruptions by the Government under the terms of the contract (e.g., delays required to obtain required security clearances);
- Conflicts with other contractors performing related tasks; and
- Material shortages

Interruptions or shortages, will result in a cost to the offeror, so the offeror will try to anticipate the likelihood of interruptions and include them in the total proposed cost. You will need to determine what interruptions may reasonably occur and the costs that would be incurred by the contractor as a result of those interruptions.

For example: An offeror is proposing to perform a contract for electrical rewiring on five reserve cargo ships. On a similar contract, the offeror experienced numerous delays because of scheduling conflicts with other contractors performing related work on the same ships. The firm expects similar working conditions on the proposed contract, so it has estimated costs based on the firm's experience on the earlier contract.

Evaluating Assumptions Regarding Interruptions and Shortages. When analyzing the effect of projected interruptions or shortages, consider the following questions:

- Are proposal assumptions about interruptions and shortages realistic?

In particular, remember that if the contractor can prevent the interruption or shortage without additional cost, you should not include additional cost in your position on contract price.

- Are proposal assumptions about interruptions and shortages consistent with the rest of the
proposal?

Be particularly careful to assure that the effects of potential interruptions and shortages are only considered once in a proposal. For example, an estimate based on the actual cost of previous contracts may already include costs of interruptions (e.g., security requirements) that are a common part of contract performance.

- Is the proposal estimate of the effect of an interruption or shortage reasonable?

Examine the reasonableness of the estimate prepared by the offeror based on the offeror's approach to the interruption or shortage. In addition, you should consider other approaches. If the Government customer can tolerate a delay in contract performance, it may be wiser to delay contract award until the danger of interruption or shortage is eliminated.

**Identifying Assumptions Regarding Inflation/Deflation.** Offerors commonly consider inflation/deflation when making contract cost estimates based on historical contract costs. When the contract performance is expected to extend beyond a few months, an offeror may also include assumptions about inflation/deflation during contract performance.

**For example:** An offeror is preparing a proposal to manufacture 500 units of equipment to meet Government contract requirements. The firm completed a similar contract just nine months ago. Because the cost data are so recent, the firm has decided to estimate contract costs based on cost data from the recent contract plus five percent to allow for inflation since the last contract.

**Evaluating Assumptions Regarding Inflation/Deflation.** When analyzing the effect of projected inflation/deflation, consider the following questions:

- Is the proposal assumption realistic?

There are numerous price indexes that you can use in evaluating the offerors assumed inflation/deflation. Be sure that any index numbers are appropriate for your analysis situation. Two of the most common index sources are the:

- Producer Price Index (PPI); and

- Is the assumption consistent with the rest of the proposal?

Assure that it is appropriate to use an adjustment for inflation. For example, do not add an inflation factor to current quotes when contract material will be ordered and delivered immediately after contract award.

- How does the proposal assumption affect contract cost?

Remember that some prices are actually decreasing. Make sure that you consider potential price decreases as well as potential price increases.

### 5.1.3 Determining Proper Contingency Cost Treatment

Contingencies ([FAR 31.205-7](https://www.federalregister.gov/documents/2023/01/14/2023-00007/5-1.3-determining-proper-contingency-cost-treatment)). Most estimates of the cost of future contract performance involve contingencies. A contingency is a possible future event or condition arising from presently known or unknown causes, the outcome of which cannot be precisely determined at the present time.

For cost estimating purposes, contingencies fall into two categories:

- Contingencies that arise from presently known and existing conditions, with effects on contract cost that can be forecast within reasonable limits of accuracy.

In other words, the contracting parties are aware of the conditions that will affect future costs and they are able to reasonably estimate the related affect on contract cost.

**For example:** An offeror is preparing an estimate of material cost. One material item is sheet metal that will be used to produce parts of different shapes. The offeror knows that some part of the metal will eventually become scrap. Using scrap records from similar contracts and an understanding of the proposed contract requirements, the offeror can develop a reasonably good estimate of proposed contract costs.

- Contingencies that arise from presently known or unknown conditions, with effects on contract cost that cannot be forecast precisely enough to provide equitable results to the contractor and the Government.
In other words, the contracting parties cannot reasonably estimate contract costs for one of the following reasons.

- The contracting parties are aware of conditions that will affect future costs but they are unable to reasonably estimate the related affect on contract cost.
- The contracting parties are not aware of all the conditions that will affect future contract cost and are therefore unable to reasonably estimate contract cost.

For example: A firm is involved in litigation concerning the proper interpretation of an apparent conflict between Government contract cost principles and state tax law. If the court accepts the state's position, contract costs will increase substantially. If the court accepts the contractor's (and the Government's) position, costs will remain unchanged. The case may not be resolved for several years. Right now there is no way to forecast how the case will end, and there is no way to estimate the final effect of the litigation on contract cost.

Contingencies, Contract Costs, and Separate Agreements (FAR 15.402(c), FAR 31.205-7(c), and FAR 31.109).

If you can reasonably estimate the cost associated with a particular contingency, include that estimated cost in the contract total cost estimate. If you cannot reasonably estimate the cost associated with a particular contingency, exclude all costs related to that contingency from the contract cost estimate. Instead, the cost should be disclosed separately to facilitate the negotiation of appropriate contract coverage. Normally, that contract coverage will be based on a formal agreement about how the cost will be treated once the cost is known or can be equitably estimated. That agreement may apply to a single contract, group of contracts, or all contracts with the contractor.

- Before you begin negotiation of an agreement that is likely to affect more than one contract:
  - Identify contracts and contracting activities that might be affected;
  - Inform each contracting activity or agency of the matters that you intend to negotiate; and (as appropriate)
  - Invite the affected contracting activities or agencies and the cognizant audit agency to participate in prenegotiation discussions and/or subsequent negotiations.
- After you reach an agreement that is likely to affect more than one contracting activity or agency, distribute a copy of the executed agreement to other interested parties, including the cognizant audit agency.

Contingencies and Historical Costs (FAR 31.205-7). As stated above, a contingency is a possible future event or condition arising from presently known or unknown causes, the outcome of which cannot be precisely determined at the present time. Therefore, you should not include contingency-related costs in pricing positions based on actual incurred costs. If all contract costs are known, future events will no longer have any affect on contract cost.

For example: An offeror normally estimates direct labor hours for engineering support as five percent of manufacturing direct labor hours. The purpose of this contingency for engineering support is to estimate the hours required to resolve product design problems identified during production. If you are analyzing a contract modification proposal after all manufacturing work is completed there will be no need for additional engineering support on that contract, because there will no more production design problems that require resolution. In that situation, concentrate on evaluating the reasonableness of actual costs. Do not simply calculate engineering support direct labor hours as five percent of actual manufacturing direct labor hours.

Note: In some cases (e.g. contract termination), you may need to use a contingency factor to recognize minor unsettled contract factors. Make sure that the contingency factor does not duplicate costs already specifically included in available actual costs.

5.2 Applying Should-Cost Principles In Objective Development

This section identifies principles that you should consider as you attempt to determine what a contract should cost.

- 5.2.1 - Identifying Causes Of Inefficient Or Uneconomical Performance
5.2.2 - Performing A Formal Should-Cost Review Development

https://acc.dau.mil/CommunityBrowser.aspx?id=379510 - 5.2.2

5.2.1 Identifying Causes Of Inefficient Or Uneconomical Performance

Key Areas for Cost Analysis (FAR 15.404-1(c)(1)). Once you have identified and evaluated offeror planning assumptions, you are ready to continue your cost analysis. As you do, remember that the objective of cost analysis is to review and evaluate the separate elements of cost to form an opinion on whether proposed costs represent what the cost of the contract should be, assuming reasonable economy and efficiency. Put another way, the objective of cost analysis is to develop a position on what the contract should cost, assuming reasonable economy and efficiency.

To attain this objective, you must understand where to look and what to look for. Key areas to check for possible improvements in economy and efficiency include:

- Contract task and subtask contribution to meeting contract requirements;
- Methods used in contract performance;
- Facilities used in contract performance;
- Equipment used in contract performance;
- Computer hardware and software used to support contract performance;
- Contractor management and operating systems; and
- Other aspects of contract performance.

Contract Task and Subtask Contribution to Meeting Contract Requirements. Examine the tasks and subtasks within the work packages of the contractor's proposal to see if they are necessary and if they really add value to the final product.

For example: A manufacturer's proposal may include repetitive tests of the same product performed by workers, line managers, and various quality assurance personnel. Even with all of this repetitive testing, the number of defective units is still projected to be a large percentage of total production. Likely many of the these tests can be eliminated by greater reliance on worker application of statistical process control techniques. The result could be improved quality and reduced cost.

Methods Used in Contract Performance. With the assistance of technical personnel, examine offeror-proposed methods for possible improvement. Consider both different methods and improvements to existing methods. Question any methods that appear inefficient or uneconomic.

For example: Some tasks can be performed manually, but they can be performed more efficiently and effectively using automated equipment.

Facilities Used in Contract Performance. Examine facilities and facility layout for possible changes that might reduce costs and improve contract performance. When appropriate, complete a cost-benefit analysis as part of your examination. In simple terms, a cost-benefit analysis compares the savings from the change with the cost of making the change. If the costs are less than the savings, then the change is worth pursuing.

For example: The cost of fabricating a system component could be reduced by $150,000 per unit if a new $1,000,000 facility were placed in operation. The current proposal is for six systems and the facility would not be operational until the fourth system. However, the total program calls for production of 38 systems over the next five years.

- Is it cost effective to invest in the new facility considering only the current contract?

If you only consider the six remaining systems under the current contract, the new facility would increase costs by $100,000.

Net Benefit = (Savings per Unit * Units) - (Cost of Change)
= ($150,000 * 6) - $1,000,000
= $900,000 - $1,000,000
= - $100,000
- Is it cost effective to invest in the new facility considering projected requirements?

If you consider the projected 38 system requirement, the new facility would decrease costs by $4,700,000.
Net Benefit = (Savings per Unit * Units) - (Cost of Change)
= ($150,000 * 38) - $1,000,000
= $5,700,000 - $1,000,000
= $4,700,000

- Should you only consider the current contract, or should you consider projected requirements?

In the example above, if you only consider the current contract, the investment would not be cost effective. If you consider all 38 systems, the savings would substantially outweigh the cost of the investment. When evaluating which results to use in your analysis, you should consider the viability and direction of the entire program.

Note: To simplify the examples above, the concept of present value analysis and cost of money adjustments were not considered. You should include both in any contract-related cost-benefit analysis.

Equipment Used in Contract Performance. Examine equipment and contract requirements for possible inefficient or uneconomical performance. Equipment may be inefficient, out of tolerance, or expensive and time consuming to maintain. The projected production rate may be significantly greater or less than the optimum rate for the equipment. In any case, you should review the total shop loading for a machine or work station, not just the current proposal.

For example: The offeror proposes to use a large piece of automated equipment to meet contract subsystem requirements. The capacity of this equipment is 20,000 units per day, but the contractor is currently producing only 2,800 units per day. A cost benefit analysis shows that the cost of producing the small number of units required is about twice the cost of using a system designed to produce 4,000 units per day.

Computer Hardware and Software used to Support Contract Performance. The cost of computer resources used to support the contract could be categorized as a direct cost (specific to the program), or indirect cost (general purpose). Both categories are worth attention. Check both categories for inefficient and uneconomical use. In particular, look for duplications in computer resources, because duplications are commonly found at all types of contractors.

For example: An offeror's Data Automation Department has the capability to perform program planning analysis. Department A uses its own, non-networked personal computers for its program planning analysis. Department B uses computers on a local area network for the same tasks but with software that is not compatible with Department A or the Data Automation Department. This duplication is costly and there are substantial opportunities for cost reduction.

Contractor Management and Operating Systems. Examine the effect of management systems on contract performance and contract cost. In particular, look for inefficient or unnecessary systems. Since business automation has reduced the need for many clerical and mid-level management functions, these functions are good targets for improvement. Look for ways to eliminate nonvalue-added functions and shorten the line of communication and authority.

For example: A contractor is producing a large system to meet unique Government requirements. Effective scheduling of the firm's vast resources is essential to efficient contract performance. Over the past year, the firm has had several lay-offs in key production areas. Later the employees were recalled and put on substantial overtime to meet production requirements. Experts estimate that an effective scheduling system could have reduced the cost of these operations by 25 percent.

Other Aspects of Contract Performance. Depending on the type of contract effort involved, the specific circumstances of the acquisition, and contractor's particular practices, other aspects of the total environment may deserve attention. While these aspects differ greatly from contract to contract, some of the possible candidates include:

- Business forecasting,
- Staff planning,
- Capital investment planning,
- Test planning, and
- Anything else that has the potential of significantly affecting contract cost.
5.2.2 Performing A Formal Should-Cost Review

Should-Cost Review Concept (FAR 7.105(a)(3)(iii) and FAR 15.407-4). You can use should-cost techniques in any proposal cost analysis. However, for a major program involving large costs, consider using a formal should-cost review. A formal should-cost review is a multifunctional team evaluation of the economy and efficiency of the contractor's existing work force, methods, materials, facilities, operating systems, and management.

There are two types: the program should-cost review and the overhead should-cost review. These analyses may be performed together or independently. The scope of a should-cost review can range from a large-scale review examining the contractor's entire operation (including plant-wide overhead and selected major subcontractors) to a small-scale tailored review examining specific portions of a contractor's operation.

Each should-cost team should be tailored to the required analysis, but it is not uncommon for a should-cost team to include 50 - 60 analysts. Team members typically include representatives from contracting, contract administration, pricing, audit, engineering, and other technical specialties. Most will be Government personnel, but some may be technical specialists contracted to support the should-cost review.

The decision on conducting a should-cost should be a part of acquisition planning. Before initiating a should-cost review, consider the potential benefits and the cost of the analysis. A large-scale should-cost will be expensive, but savings can be substantial. Management support is vital to an effective should-cost review. The information and findings produced by formal should-cost analyses have historically attracted a great deal of attention and support from upper levels of both contractor and Government management. 

Should-Cost Objective (FAR 15.407-4(a)(1)). The should-cost objective is not restricted to optimizing costs on a single contract. The should-cost objective is to promote both short and long-range improvements in the contractor's economy and efficiency in order to reduce the cost of performing Government contracts. By providing a rationale for any recommendations and quantifying their impact on cost, the Government will be better able to develop realistic price objectives for use in contract negotiations.

Program Should-Cost Review (FAR 15.407-4(b) and DFARS 215.407-4(b)(2)). A program should-cost review is an evaluation of significant direct cost elements (e.g., material, labor, and associated indirect costs) usually incurred in the production of major systems (e.g., DoD definitive major systems contracts exceeding $100 million). Consider initiating a program should-cost review (particularly in the case of a major system acquisition) in the following circumstances:

- Some initial production has already taken place;
- The contract will be awarded on a sole-source basis;
- There are future year production requirements for substantial quantities of like items;
- The items being acquired have a history of increasing costs;
- The work is sufficiently defined to permit an effective analysis and major changes are unlikely;
- Sufficient time is available to adequately plan and conduct the should-cost review; and
- Personnel with the required skills are available or can be assigned for the duration of the should-cost review.

Program Should-Cost Team Organization (FAR 15.407-4(b)(3)). A program should-cost facilitates a comprehensive review by bringing together an integrated team of experts. The breadth and depth of available experience permits the team to identify and pursue problems in much greater depth than would be possible using a traditional review format.

Select team members after determining which elements of the contractor's operation have the greatest potential for cost savings. Use the experience of on-site Government personnel when appropriate. If the team is large, consider dividing team members into subteams. Each subteam will then be able to concentrate on a specific area of contractor performance, such as:

- Manufacturing;
- Pricing and accounting;
- Management and organization; and
- Subcontract and vendor management.

Program Should-Cost Report (FAR 15.407-4(b)(4)). When you conduct a program should-cost review, you must prepare a should-cost report in accordance with agency procedures. That report should clearly identify any uneconomical or inefficient practices identified during the review. When the should-cost team is divided into subteams, you might request each subteam to contribute its findings and recommendations. Then you can review subteam findings for consistency and combine them to produce a comprehensive final report. Normally, you should formally review significant team findings with the contractor before the should-cost report is finalized and distributed. Provide the contractor an overview of major areas of team concern, but do not make specific recommendations on how the contractor should correct identified deficiencies.

Government Action Based on Program Should-Cost Review Results (FAR 15.407-4(b)(4)). Consider the findings and recommendations contained in the program should-cost report when negotiating the contract price. After completing the negotiation, provide the administrative contracting officer (ACO) a report of any identified uneconomical or inefficient practices, together with a report of correction or disposition agreements reached with the contractor. Then establish a follow-up plan to monitor contractor correction of identified uneconomical or inefficient practices.

Overhead Should-Cost Review (FAR 15.407-4(c)). An overhead should-cost review is an evaluation of contractor indirect costs, such as fringe benefits, shipping and receiving, facilities and equipment, depreciation, plant maintenance and security, taxes, and general and administrative activities. An overhead should-cost review is normally used to support evaluation and negotiation of a forward pricing rate agreement (FPRA) with the contractor. Consider the following factors whenever you evaluate a contractor site for possible overhead should-cost review:

- Dollar amount of Government business;
- Level of Government participation;
- Level of noncompetitive Government contracts;
- Volume of proposal activity;
- Major system or program;
- Corporate reorganizations, mergers, acquisitions, or takeovers; and
- Other conditions (e.g., changes in accounting systems, management, or business activity).

Also consider any additional criteria established by your agency. For example, in the DoD, the head of the contracting activity may request an overhead should-cost review for any business unit. However, the DoD does not normally consider a contractor business unit for a should-cost review unless it meets all of the following criteria:

- Projected annual sales to the DoD exceed $1 billion;
- Projected DoD business exceeds 30 percent of total business;
- Level of sole-source DoD contracts is high;
- Significant volume of proposal activity is anticipated;
- Production or development of a major weapon system or program is anticipated;
- Contractor cost control/reduction initiatives appear inadequate, and
- No overhead should-cost has been conducted at the business unit in the last three years.

Overhead Should-Cost Team Organization. Like the program should-cost review, the overhead should-cost review requires an integrated team of experts. The breadth and depth of available experience permits the team to identify and pursue problems in much greater depth than would be possible using a traditional review format. Select team members after determining which elements of the contractor's areas affecting indirect costs
have the greatest potential for cost savings. If the team is large, consider dividing team members into subteams. Each subteam will then be able to concentrate on a specific area, such as:

- Sales volume and indirect cost allocation bases;
- Indirect labor cost; and
- Non-labor indirect cost.

Overhead Should-Cost Report (FAR 15.407-4(c)(3)). If an overhead should-cost review is conducted in conjunction with a program should-cost review, a separate overhead should-cost report is not required. However, the findings and recommendations of the overhead should-cost team, or any separate overhead should-cost review report, must be provided to the ACO responsible for negotiating indirect cost rates.

Government Action Based on Overhead Should-Cost Results FAR 15.407-4(c)(3). The ACO should use the results of the should-cost review as the basis for the Government position in negotiating an FPRA with the contractor. In addition, the ACO must establish a follow-up plan to monitor the correction of the contractor's uneconomical or inefficient practices.

5.3 Recognizing Cost Risk
In this section, you will learn to identify the types of risks inherent in an offeror's cost estimate and how these risks affect the offeror's estimate.

- 5.3.1 Identifying Principal Sources Of Cost Risk
- 5.3.2 Assessing The Level Of Risk
- 5.3.3 Using Contract Type To Mitigate Risk
- 5.3.4 Using Clear Technical Requirements To Mitigate Risk
- 5.3.5 Using Government Furnished Property To Mitigate Risk
- 5.3.6 Using Contract Terms And Conditions To Mitigate Risk

5.3.1 Identifying Principal Sources Of Cost Risk
When the offeror considers entering into a contract with the Government, the offeror must consider the risk of the various contract obligations.

The risk to the offeror can be viewed from several perspectives:

- **Investment risk** -- the risk in recovering the money invested by the offeror to perform the job.
- **Economic risk** -- the risk in earning a reasonable profit on the investment, especially when compared to other possible investments.
- **Performance risk** -- the risk in successfully performing the work required by the contract.

You can be assured that, as long as there is a reasonable expectation of success and the profit or other payoff is great enough to warrant taking the risk, there will be contractors available to take on the work. However, if the outcome is too uncertain and the rewards too little for the risk involved, you might NOT find a responsible contractor willing to submit an offer.

**Investment Risk.** In order to perform on a contract, the offeror may have to plan to make costly investments for such things as facilities, equipment, and materials. The offeror will need a reasonable assurance that these investments will be recouped from contract performance. If the offeror feels that the investments are for facilities, equipment, and materials that can only be used for a specific Government product, then the offeror may conclude that the investment risk is too great. Or, the offeror may choose to avoid such investment risk by proposing a less efficient use of manual labor, instead of investing in more efficient-and more expensive-facilities and equipment. (One of the reasons frequently given for the high proportion of manual labor in Government contracts, compared toct are well established and the costs can be reasonably estimated. You should not use a fixed-price contract when the methods required to complete the contract are not well established and costs cannot be reasonably estimated. If you do, the uncertainty will likely have one of two results:
• Competition will decrease, because potential offerors will decline to submit a proposal rather than accept the risk, or
• Costs will increase, because offerors will "pad" their estimates to cover the uncertainties.

**Cost-Reimbursement Contracts.** Cost-reimbursement contracts provide for reimbursement of all allowable contract costs whether or not the contractor completes all contract requirements.
• Consider a cost-reimbursement contract when cost risk is high and the contractor cannot estimate cost with reliable accuracy.
  o These conditions commonly exist when the contract requirements are only generally defined and the amount of work needed to complete the contract is uncertain.
  o Cost-reimbursement contracts deal with this uncertainty by only requiring the contractor to deliver its "best effort" to provide the product.
• You should not use a cost-reimbursement contract when contract risk is low, because cost-reimbursement contracts require substantial administration and do not provide the same motivation to control costs that is provided by fixed-price contracts.

**Most Frequently Use Contract Types.** There are different types of contracts within both the fixed-price and cost-reimbursement categories. Each type deals differently with cost risk. You will want to select the contract type best suited to each requirement.
Consider all available contract types, but the most commonly used are:
• Firm fixed-price (FFP); Fixed-price economic price adjustment (FPEPA);
• Fixed-price incentive firm (FPIF);
• Cost-plus-incentive-fee (CPIF);
• Cost-plus-award-fee (CPAF); and
• Cost-plus-fixed-fee (CPFF).

**Cost Risk and Contract Type**. The following figure uses the stages of a major system acquisition to demonstrate how contract type alternatives typically change as contract requirements become better defined and the amount of work needed to complete the contract more certain.

### 5.3.2 Assessing the Level of Risk

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<th>Cost Risk and Contract Type</th>
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<tr>
<td>Cost Risk</td>
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<td>Requirement Definition</td>
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<td>Production Stages</td>
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<tr>
<td>Contract Type</td>
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5.3.3 Using Contract Type to Mitigate Risk

**Firm Fixed-Price (FFP) (FAR 16.202).** When the contractor is able to accurately estimate the cost of the work called for in the contract and the cost risk to the offeror is therefore very low, use an FFP contract. An FFP contract places ALL cost risk on the contractor. It requires the Government to pay a specific price when the contract items have been delivered and accepted. Unless there are contract modifications, the price for the original work is NOT adjusted after contract award regardless of the contractor's actual cost experience.

**Fixed-Price-Economic Price Adjustment (FPEPA) (FAR 16.203 and DFARS 216.203).** When there are volatile economic conditions (e.g., an unstable labor or material market) outside of the contractor's control that could affect contract cost, a FFP contract may not cover the offeror's cost risk sufficiently. In this situation, you should consider a contract that allows for price adjustments due to changes in economic conditions. FPEPA contracts are designed to cope with economic uncertainties that would threaten long-term, fixed-price arrangements. Economic price adjustment clauses provide for both price increases and decreases to protect the Government and the contractor from the effects of economic changes. If you use an FFP contract instead of an FPEPA contract, you can expect offeror's to include contingency allowances in their proposals to eliminate or reduce the risk of loss. Including such contingency allowances in contract prices is not a good solution for either the contractor or the Government. The contractor may be hurt if the changes exceed the estimate and the Government may pay unreasonably high prices if the contingency does not materialize.

**Fixed-Price Incentive Firm (FPIF) (FAR 16.204 and FAR 16.403).** In circumstances where contract requirements are largely defined but major performance uncertainty still exists (e.g., the first production run of a completely designed and tested prototype product), there will still be major cost risk but much of that risk can be limited by effective contract performance. Consider using a fixed-price incentive firm (FPIF) contract to give the contractor an incentive to effectively control costs. The basic structure of the FPIF contract includes the following elements:

- Target cost;
- Target profit;
- Ceiling price; and
- Under-target and over-target sharing formulas.

Costs under target are shared according to the share ratio established in the under-target sharing formula. Costs over target are shared according to the over-target sharing formula until the sum of incurred costs and profit equal the ceiling price -- the point of total assumption (PTA). At the PTA, cost risk responsibility shifts completely to the contractor. Each additional dollar of cost will reduce the contractor's profit or increase the contractor's loss by one dollar.

**Cost-Plus-Incentive-Fee (CPIF) (FAR 16.304, FAR 16.405-1, and DFARS 216.405-1).** When the contract calls for such risky ventures as the development and testing of a new system, the offeror's risk may be too high for any fixed-price type contract. However, you may still want to motivate the contractor to control costs. If you can negotiate a target cost and a fee adjustment formula that will motivate the contractor, consider using a CPIF contract. The basic structure of a CPIF contract includes the following elements:

- Target cost;
- Target fee;
- Maximum fee;
- Minimum fee; and
- Under-target and over-target sharing formulas.

The cost risk on this type of contract is shared by the Government and the contractor according to "sharing formulas" with limits that assure the minimum fee is large enough to motivate effective contract performance but the maximum fee is not unreasonably large for the risk involved. These limits create a range of incentive effectiveness around the target cost.
If the costs fall within the limits, they are shared by the contractor and the Government using the under-target or over-target sharing formula.

If the costs go above the upper limit, the Government is responsible for contract costs and the contractor receives the minimum fee identified in the contract.

If the costs fall below the lower limit, the Government is responsible for contract costs but the contractor’s fee is limited to the maximum fee identified in the contract.

Cost-Plus-Award-Fee (CPAF) (FAR 16.305, FAR 16.405-2, and DFARS 216.405-2). When the required contract level of effort is uncertain and it is neither feasible nor effective to devise predetermined incentive targets based on cost, technical, or schedule, consider the use of a CPAF contract if:

- The likelihood of meeting acquisition objectives can be enhanced by a flexible plan that awards fee after an evaluation of both performance and the conditions under which it was achieved; and
- The expected benefits justify the additional cost and effort required to monitor and evaluate performance.

The CPAF contract provides for a fee consisting of two parts:

- Base fee agreed to at the time of contract award; and
- Award fee that the contractor may earn in whole or in part during contract performance based on such criteria as quality, timelines, technical ingenuity, and cost effective management.

CPAF contracts MUST provide for fee evaluations at stated points during contract performance. The points may be at stated intervals (e.g., quarterly) or at stated milestones of contract performance (e.g., completion of a product design test).

The amount of award fee is judgmental determination made by the Government fee determining official (FDO) and is not subject to dispute under the contract Disputes clause. The U.S. Court of Appeals for the Federal Circuit found in 1997 that a Board of Contract Appeals may not reverse an FDO's discretionary decision on fee unless the discretion employed in making the decision is abused — for example if the decision was arbitrary and capricious (US-CT-APP-FC, 41 CCF ¶ 77,043).

Cost-Plus-Fixed-Fee (CPFF) (FAR 16.306). When the work required to complete a contract is so uncertain (e.g., a development or maintenance contract) that establishment of predetermined targets and incentive sharing arrangements could result in a final fee out of line with the actual work performed, you should consider a cost-plus-fixed-fee contract.

This type of contract is designed chiefly for use in research or exploratory development or operation and maintenance types of contracts where the level of contractor effort CANNOT be accurately estimated. The Government agrees to reimburse the contractor for all allowable costs incurred during the performance of the contract up to the contract cost or funding limits. Moreover, the Government agrees to pay the contractor a fixed number of dollars above the cost as a fee for doing the work. Fee dollars are fixed at time of contract award and change only if the scope of work changes. Contract Type Selection.

The following table describes five acquisition situations and the appropriate contract type for each situation.

<table>
<thead>
<tr>
<th>When ...</th>
<th>Select a ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>The offeror can accurately estimate cost.</td>
<td>Firm Fixed-Price Contract</td>
</tr>
<tr>
<td>Economic conditions that will likely affect cost significantly are outside of the offeror's control, but otherwise the offeror can accurately estimate cost.</td>
<td>Fixed-Price Economic Price Adjustment Contract</td>
</tr>
<tr>
<td>There are substantial cost uncertainties, but it should be possible to reasonably estimate maximum cost and effective contractor management should be able to assure that final costs will not exceed the estimated maximum cost.</td>
<td>Fixed-Price Incentive Firm Contract</td>
</tr>
</tbody>
</table>
The cost uncertainties are so great that any fixed-price contract would force the contractor to accept an unreasonable risk, but you can negotiate reasonable targets and formulas for sharing costs.

Cost-Plus-Incentive-Fee Contract

The contract level of effort is uncertain and it is NOT feasible or effective to negotiate an adjustment formula but the likelihood of meeting objectives can be enhanced by a clear subjective fee plan.

Cost-Plus-Award-Fee Contract

Cost uncertainty is so great that establishment of predetermined targets and incentive sharing arrangements could result in a final fee out of line with the actual work.

Cost-Plus-Fixed-Fee Contract

Cost-Plus-Percentage-Cost (CPPC)

BEWARE! The CPPC contract is illegal in Government contracting. A CPPC contract can occur in any situation where the contractor is allowed to increase fee by increasing cost, thereby creating a negative cost control incentive. If the answers to the following four questions are yes, you have a CPPC contract.

- Will fee be paid based on a predetermined percentage fee rate instead of an identified dollar value?
- Will the predetermined percentage fee rate be applied to actual future performance costs?
- Is the contractor's fee entitlement uncertain at the time of contract pricing?
- Will the contractor's fee entitlement increase as performance costs increase?

5.3.4 Using Clear Technical Requirements To Mitigate Risk

Requirements and Risk. You can influence the inherent risk of a project by using clear contract technical requirements. If the requirements are actually impossible to perform, conflict, or are open to interpretation, the Government and the contractor are at risk of unacceptable or substandard contract performance.

Government and contractor technical personnel must understand, however, that if any technical problems are identified, they MUST be brought to the attention of the contracting officer immediately. The longer the problems exist without resolution, the greater the risk to both the Government and the contractor. Costly legal actions can result from defective technical requirements.

Impossible Requirements. The writer of the contract requirements is responsible for their accuracy. If technical requirements are impossible to meet (e.g., a set of drawings has mistakes that make the product impossible to build), the writer of the requirements is the responsible party and liable for any related additional costs. Since the Government writes contract requirements, the Government is liable for reasonable additional costs related to those requirements.

Conflicting Areas Within Requirements. Contract technical requirements do NOT have to be written so poorly that they are impossible to perform for them to have a detrimental effect on contract performance. If requirements conflict with each other, changes and rework can cause costly delays. Again, the Government, as writer of the contract requirements, is responsible and liable for reasonable additional costs.

Requirement Ambiguity. Make sure the contract requirements are written as clearly as possible. Ambiguities can lead to misinterpretation. The Government will be held liable, as writer of the contract, for any ambiguity resulting in additional costs.

5.3.5 Using Government Furnished Property To Mitigate Risk

Government Furnished Property and Risk. Government furnished property (GFP) is one way you can reduce the risk to the contractor and thus make a contract more attractive. GFP, including Government-owned equipment, facilities, and materials, provided to the contractor can lower contract costs by shifting investment risk from the contractor to the Government.
Risks Assumed with GFP. By providing GFP to the contractor, the Government accepts risk in one of several ways:

- **Investment Risk.** GFP will shift the risk of NOT recouping the initial capital expense for the property to the Government.

- **Property Loss Risk.** If the property might be destroyed or be a hazard during or after contract performance (e.g. high explosives or rocket fuel production), the Government assumes the risk of property loss.

- **Market Risk.** The Government may reduce the risk to the contractor on production materials by providing them as GFP. Using its buying power, the Government may be able to purchase materials at lower prices than are available to the individual contractor and less risk of changes in market prices (e.g., special purpose fuels that are often supplied to contractors).

*Positive Effects of GFP.* GFP has positive effects for the contractor and for the Government:

- The contractor avoids risky investment, high liability costs, and the need to include contingencies in its proposal.

- The Government has lower cost on the current contract and reduced risk on future contracts, because the Government has the option of moving the GFP from one contractor to another, thus avoiding a high-cost, sole-source situation.

*Negative Effects.* The largest negative effect of using GFP is the large amount of administrative effort required on the part of both the Government and the contractor to track, maintain, and dispose of GFP. Large companies have entire departments dedicated to property administration. Smaller firms can easily be overwhelmed by the administrative burden. If GFP is not properly administered, it could be lost or used inappropriately on non-Government work allowing a contractor a competitive advantage over other competitors at Government expense.

5.3.6 Using Contract Terms and Conditions To Mitigate Risk

*Contract Terms and Conditions and Risk.* Contract terms and conditions can provide an avenue for tailoring requirements to specific contract cost risk concerns. Consider the needs of the Government, commercial practice, the capabilities of the offerors, and elements of risk identified in the offeror(s) proposal. It may be possible to reduce contractor risk and contract cost while still meeting the needs of the Government. The following are examples of how contract terms may be used to reduce cost risk:

**Example 1:** When a contract specifically requires the contractor to obtain a portion of contract performance from firms in other nations, accepting defined risks associated with that requirement can substantially reduce contractor cost risk (e.g., currency fluctuation risk or performance risk associated with international production).

**Example 2:** Allowing variations in delivery schedules can reduce contract cost risk by allowing for optimal production and shipping schedules.

**Example 3:** Obligating the Government to provide existing Government data can eliminate the cost and risk associated with the contractor obtaining the data from other sources.

**Example 4:** Permitting variations in delivery quantities can reduce risk by allowing for standard lot shipments and the elimination of excessive administrative work related to insignificant shipment shortages or overages.

**Example 5:** Unusual contract financing in lieu of customary contract financing can reduce contractor cost risk on a long-term contract requiring significant capital investment.

- **6.0 - Chapter Introduction**
- **6.1 - Identifying Direct Material Costs For Analysis**
  - 6.1.1 - Identifying Material Cost Elements
  - 6.1.2 - Identifying Collateral Costs
  - 6.1.3 - Identifying Related Costs
  - 6.1.4 - Planning For Further Analysis
6.0 Chapter Introduction
Direct material costs often account for more than half of total contract cost. This chapter will present points to consider when you develop a prenegotiation position on direct material costs. Flowchart of Direct Material Costs Analysis:
6.1 Identifying Direct Material Costs For Analysis
This section will identify the types of costs that may be classified as direct material costs and points to consider in planning for further analysis.

- 6.1.1 - Identifying Material Cost Elements
- 6.1.2 - Identifying Collateral Costs
- 6.1.3 - Identifying Related Costs
- 6.1.4 - Planning For Further Analysis

https://acc.dau.mil/CommunityBrowser.aspx?id=379511 - 6.1.4

6.1.1 Identifying Material Cost Elements
Material Cost (FAR 31.205-26). The cost of materials used to complete a contract normally includes more than just the cost of the materials that actually become part of the product. Costs typically include:

- Raw materials, parts, subassemblies, components, and manufacturing supplies that actually become part of the product;
- Collateral costs, such as freight and insurance; and
- Material that cannot be used for its intended purpose (e.g., overruns, spoilage, and defective parts).

Direct vs. Indirect Material Cost (FAR 2.101, FAR 31.202 and FAR 31.203). Each firm is responsible for determining whether a specific cost will be charged as a direct cost or an indirect cost, and you will find that accounting and estimating treatment will vary from firm to firm. This section describes the general practices that you can use to identify direct material costs for analysis.

- **Direct Material Cost.** A direct material cost is any material cost that can be identified specifically with a final cost objective (e.g., a particular contract).
  - Material costs identified specifically with a particular contract are direct costs of the contract and must be charged to that contract.
  - Material costs must not be charged to a contract as a direct cost if other material costs incurred for the same purpose in like circumstances have been charged as an indirect cost to that contract or any other contract.
  - All material costs specifically identified with other contracts are direct costs for those contracts and must not be charged to another contract directly or indirectly.

- **Indirect Material Cost.** An indirect material cost is any material cost not directly identified with a single final cost objective, but identified with two or more final cost objectives or an intermediate cost objective. For reasons of practicality, any direct material cost of minor dollar amount may be treated as an indirect cost if the accounting treatment:
  - Is consistently applied to all final objectives, and
  - Produces substantially the same results as treating the cost as a direct cost.

Accounting for Materials. The following table matches material types with their most common accounting treatment. This table is only a general guide. Proper accounting treatment will vary with different acquisition environments and the specific accounting guidance adopted by the firm.

<table>
<thead>
<tr>
<th>Material Type*</th>
<th>Description</th>
<th>Accounting Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Materials</td>
<td>Materials that require further processing</td>
<td>Normally a direct cost</td>
</tr>
<tr>
<td>Parts</td>
<td>Items which, when joined together with another item, are not normally subject to</td>
<td>Normally a direct cost but possibly an indirect cost if price is very small</td>
</tr>
</tbody>
</table>
disassembly without destruction or impairment of use

Subassemblies
Self-contained units of an assembly that can be removed, replaced, and repaired separately
Normally a direct cost

Components
Items which generally have the physical characteristics of relatively simple hardware items and which are listed in the specifications for an assembly, subassembly, or end item
Normally a direct cost

Manufacturing Supplies
Items of supply that are required by a manufacturing process or in support of manufacturing activities
Normally an indirect cost

* The material types in this table are drawn from FAR 31.205-26(a), Material Costs. The terms reflect a manufacturing orientation. When analyzing material costs proposed for services or construction, compare the proposed use of the materials with the definitions in this table for the most appropriate accounting treatment. Also, consider the general guidance offered on the previous page.

6.1.2 Identifying Collateral Costs
Collateral Cost Accounting Treatment (FAR 31.205-26(a)). Collateral costs are expenses associated with getting materials into the offeror's plant. Inbound transportation and intransit insurance are two common examples. These costs may either be treated as direct costs or indirect costs depending on the guidelines established by the firm. If they are treated as direct costs, they are normally tracked with the cost of the associated material item.

As you perform your cost analysis, make sure that the proposed treatment is consistent with the firm's treatment of similar costs under similar circumstances. Also make sure that the offeror is not charging twice for the same transportation and insurance cost. The cognizant Government auditor will be able to assist you in determining whether the proposal correctly recognizes transportation costs consistent with the offeror's prescribed accounting practices.

For example: When an item is bought f.o.b. destination the price normally includes delivery to a point designated by the buyer. Unless some type of special handling is required, the buyer should not have any additional transportation or in-transit insurance costs.

Inbound Transportation (FAR 31.205-26(a) and FAR 31.205-45). Inbound transportation cost, also known as freight-in expense, is the cost of transporting material to the place of contract performance. It may be the cost of transportation from the supplier's plant or some intermediate shipping point. This cost is allowable as long as it is reasonable, but remember that this cost should be included in any price quoted f.o.b. destination.

Intransit Insurance (FAR 31.205-19 and FAR 31.205-26(a)). The intransit insurance expense related to material is the cost of insurance for inbound material. Any costs of insurance required or approved by the Government and maintained by the contractor under a Government contract are allowable. The cost of intransit insurance not specifically required or approved under a Government contract must meet appropriate FAR and CAS requirements. The most basic requirements are that the types and extent of insurance must follow sound business practice, and the rates and premiums must be reasonable.
6.1.3 Identifying Related Costs

Accounting for Related Materials (FAR 31.205-26(a)). Identify estimates of excess materials that the offeror proposes to purchase to assure that sufficient material is available for production of the item. Estimates may include costs related to material overruns, scrap, spoilage, or defective parts.

- Some offerors will develop a single estimate which encompasses all of these costs. When a single estimate is used, it is usually referred to as scrap.

- Other offerors will develop separate estimates for several of the different types of excess material cost. When a firm develops separate estimates, make sure that each type of excess material cost is clearly defined and that the same costs do not appear in different estimates.

Estimates of these costs are usually developed using a cost estimating relationship (CER) -- a relationship between the cost and some independent variable related to a parameter of the item or service being acquired or a related contract cost. The proposal and related documentation must provide adequate analysis and statistical data to identify and support any CER used in estimating direct material cost.

Remember that material overruns, scrap, spoilage, or defective parts not used on the proposed contract will still have residual value. The offeror might use this material in producing other products, or sell it for reclamation or reprocessing. As a result, the estimated contract cost must be adjusted to consider that residual value. The offeror might adjust the proposal by subtracting the estimated residual value from the estimated direct material cost. More commonly, offerors will estimate the residual value of such material for all contracts for the year and then subtract that estimated amount from an appropriate overhead account. Each contract proposal estimate is then reduced by use of the lower overhead rate.

Overruns. Simply stated, overruns are the purchase or production of more units than are required by the job.

For example: A minimum order quantity requirement is a common example. An assembly requires 25 units of a special fastener that can only be bought in quantities of 100. If the fastener can only be used on the one contract, you should expect to pay for all 100 units. On the other hand, if the fastener has general application to other items produced by the firm, you should expect to only pay only for the units used on your contract.

Scrap. Scrap is material that is no longer usable for the purpose for which it was originally purchased.

For example: A casting may require machining prior to its use as part of a larger assembly. The material removed during the machining process is scrap. A sheet of metal may have a variety of shapes cut from it. The leftover pieces that are too small to cut into the required shapes are scrap.

Spoilage. There are many kinds of spoilage. Some of the more common types of spoilage are:

- Shelf-life. Shelf-life is the length of time some materials retain their usable properties while waiting to be used, after that time they must be discarded.

For example: Industrial silicon rubber compounds are used as coatings or adhesives in many manufacturing processes. If these compounds are not used within a certain time period (their shelf-life), they lose their usable properties and have to be discarded.

- Losses. Material losses are discrepancies between inventory records and physical inventory. Normally, these discrepancies are discovered during physical inventories. The inventory records indicate that the material is there, but an actual count finds that the material is no longer available. When inventory records indicate that the inventory includes more material than the physical count, the excess material must be removed from the inventory records or "written off."

For example: Lost materials may have been stolen, inadvertently discarded, or misplaced.

- Obsolescence. This can occur anytime there is a large inventory that will meet needs for a long period. Materials may become obsolete due to design changes that require new parts or materials, thus rendering the old inventory useless.

For example: Item specifications are changed. A production part is now obsolete because it is no longer needed for production.

Defective Parts. Defective parts are items that fail to meet required specifications. Depending on the severity of the defect, such parts can be scrapped, reworked, or "used as is." Defective parts are also known as "yield." Whether a defective part is usable as is, reworkable, or just scrap, there are costs associated with the action that must be considered in a cost estimating and analysis.
Scrap. If the defective part cannot be used for its intended purpose or made usable, it will usually be charged as scrap.

Rework. This is the process of taking the defective part and working on it again to correct the identified defects. If, after rework, the item meets specifications, it can be accepted. If the reworked item fails inspection again, it may be either reworked again or scrapped.

Rework cost is normally seen in labor expense. However, rework does help reduce scrap costs. Depending on the offeror's accounting system, the material used during rework may be accounted for separate from normal scrap.

Use as is. This means that, while the part does not meet all contract requirements, the defect does not affect the part's ability to perform its intended function.

After a part has been properly examined and approved for use by the offeror's quality system, a "use as is" part, it can be incorporated into the end product. The costs associated with making the "use as is" decision are normally quality assurance labor and overhead. The value of the part is not affected unless a specific cost reduction is negotiated by the contractor and the Government.

6.1.4 Planning For Further Analysis

Points to Consider. As you prepare your plan for direct material cost analysis, look for indicators of uneconomical or inefficient practices. Material items with a large dollar value or unusual requirements normally rate in-depth analysis. If an element of proposed material cost appears suspicious, concentrate more analysis effort on that element than on a less suspicious cost element of similar dollar value. As you plan:

- Identify and evaluate the methodology used by the offeror to estimate direct material cost
- Identify any proposed direct material that does not appear necessary to the contract effort
- Identify any proposed direct material that should be classified as an indirect cost
- Identify any proposed direct material costs that merit special attention because of high-value or other reasons
- Assure that preliminary concerns about material cost estimates are well documented

Identify and Evaluate Estimating Methodology. To identify and evaluate the methodology used by the offeror to estimate direct material cost, ask questions such as the following:

- Is the estimate a summary-level or a detailed estimate?

In a summary estimate, material cost is estimated on a total-cost basis without the benefit of a detailed cost breakdown of material units and cost per unit. In a detailed-level estimate, material cost is estimated based on estimates of the number of material units required and the cost per unit.

- Does the methodology appear appropriate for the current estimating situation?

The method selected should use the information available to produce reasonable and equitable results. If the methodology used by the offeror does not appear appropriate, consider using a different methodology to develop your pricing position.

- Is the estimating methodology consistent with estimating assumptions?

If any part of the estimate is not consistent with stated estimating assumptions, question the costs involved. Identify Apparently Unnecessary Material Cost. To identify any proposed direct material that does not appear necessary to the contract effort, ask questions such as the following:

- Is the material necessary?

The reasons for any direct material not obviously required for contract performance should be clearly described in the proposal.

- Should the item be purchased, not made (or vice versa)?

Mark any item where the make-or-buy decision does not appear to result in the best value to the Government. There may be good reasons why such a decision will produce the best value to the Government, but the decision may also represent an attempt by the offeror to gain advantage at
Government expense (e.g., gain capability in new technology currently available from potential subcontractors at a lower total contract cost).

- Can less expensive material be substituted, in whole or in part?

Sometimes, proposed material may be over specified (i.e., excessively tight tolerances). Consider using value engineering techniques to identify less expensive parts (e.g., a commercial part might be available to replace a part made to unique Government requirements).

- Is the material acceptable under terms of the contract?

If the contract requires new materials, or material certifications in accordance with specifications or standards, then the proposed materials must meet those requirements.

**Identify Any Material That Should be Indirect.** To identify any proposed direct material that should be classified as an indirect cost, ask questions such as the following:

- Has the offeror consistently treated material similar to the proposed material as direct material?

If similar material has been treated as an indirect cost under similar circumstances, proposed material should likely also be an indirect cost. If the offeror classifies similar material as a direct cost in one situation and as an indirect cost in a similar situation, there is a good chance that you are being double charged -- once as a direct cost and a second time as an indirect cost! If in doubt, contact the cognizant Government auditor for assistance.

- Is the material cost proposed and accounted for in a manner consistent with the contractor's disclosure statement and documented accounting practices?

**Identify Material Costs Which Merit Special Attention.** To identify any proposed direct material costs that merit special attention because of high-value or other reasons, ask questions such as the following:

- Is any material estimate a large portion of the entire material cost estimate?

Many times a single estimate will be a large part of the entire estimate. That estimate will normally merit special attention because of the dollars involved.

- Is any material uniquely critical to contract performance?

Many times a specific material item is essential for contract performance. Related estimates may merit special attention, because the offeror may be willing to pay "any price" for the material.

**Document Material Cost Concerns.** To assure that preliminary concerns about material cost estimates are well documented, ask questions such as the following:

- Have you identified material estimates that merit special attention?

If the answer is "yes" document the areas of concern for reference as you perform more in-depth analysis.

- Has the offeror had an opportunity to answer your concerns?

Consider raising these concerns in fact-finding conversations with the offeror. If the problem is an error in the proposal, bring the error to the offeror's attention so that it can be corrected prior to formal negotiations.

### 6.2 Analyzing Summary Cost Estimates

**Steps for Summary Estimate Analysis.** In a summary material cost estimate, material cost is estimated on a total cost basis without the benefit of a detailed cost breakdown of units and cost per unit. Summary estimates may be round-table or comparison estimates. Round-table estimates commonly use words such as "engineering estimate" or "professional judgment." Comparison estimates involve the use of some form of comparison based on data from efforts completed or in progress.

As you conduct your analysis of summary direct material cost estimates:

- Give special attention to any direct material concerns identified during your preliminary review of the material mix.

- Determine whether use of summary cost estimates is appropriate for the estimating situation.

- Determine which summary estimating technique(s) was used in proposal development.
- Determine if cost estimating relationships (CERs) used in the proposal were properly developed and applied.
- Determine if direct comparisons used in the proposal have been properly developed and applied.
- Develop and document your prenegotiation position on direct material cost.

**Determine If Summary Estimates Are Appropriate.** To determine whether the use of a summary cost estimate is appropriate for the estimating situation, ask questions such as the following:
- Does the item cost warrant the expense of a detailed estimate?
- The time and effort put into an analysis needs to be commensurate with the cost of the material involved. As the dollars and percentage of total cost increase, emphasis on obtaining a detailed estimate should also increase.
- Do the cost accounting data provide a clear history?

If detailed cost data do not provide a clear material cost history, then summary estimating techniques may be the most viable alternative.
- Would the summary-level analysis be as accurate as a detailed analysis?

If the summary-level estimate is as good as a detailed analysis, then it is more cost effective to use the less costly summary analysis.

**Determine Which Summary Estimating Technique Was Used.** To determine which summary estimating techniques were used in proposal development, ask questions such as the following:
- Has the offeror estimated direct material cost using a cost estimating relationship (CER)?

Estimators can use a CER to estimate costs based on an established relationship between the cost and some independent variable. The independent variable may be a parameter of the item or service being acquired (e.g., item size or speed), or another contract cost (e.g., direct labor cost).

**For example:** An offeror might use a CER to estimate material cost for a research and development (R&D) contract. Since the purpose of an R&D contract is to learn about the unknown, there is likely no firm list of material requirements to use as a basis for estimate development. However, it may be possible to develop a CER based on the relationship between material cost and a related independent variable (e.g., material cost per direct labor dollar or material cost per direct labor hour). Of course the offeror should clearly document development and use of the CER.
- Has the offeror estimated direct material cost using a direct comparison with the cost of a similar contract effort?

A direct comparison is just that, a comparison with the cost of a similar contract effort. The similar effort could be a contract or contracts for the same product or a similar product. The assumption is that contracts with similar material requirements will have similar material costs. If this assumption is valid, the estimator can use the historical cost to estimate the cost of the new contract. When preparing the estimate, the estimator should consider the need to adjust historical costs for differences in the acquisition situation (e.g., changing value of the dollar, labor improvement, and differences in work complexity). The proposal should clearly document the similarity in material requirements and the rationale for any adjustments required to compensate for differences in the acquisition situation.

**Determine If CERs Were Properly Developed and Applied.** To determine if cost estimating relationships (CERs) used in the proposal were properly developed and applied, ask questions related to the issues and concerns associated with CER development.
- Does the available information verify the existence and accuracy of the proposed relationship?
- Is there any trend in the relationship?
- Is the CER used consistently?
- Has the CER been consistently accurate in the past? How current is the CER?
- Would another independent variable be better for developing and applying a CER?
- Is the CER a self-fulfilling prophecy?
- Would use of a detailed estimate or direct cost comparison with actuals from a prior effort
produce more accurate results?

- Does the CER estimate consider the changing value of the dollar?

Determine If Direct Comparisons Were Properly Developed and Applied. To determine if direct comparisons used in the proposal have been properly developed and applied, ask the following questions:

- Is the basic nature of the new contract effort similar enough to the historical effort to make a valid comparison?
- Does data analysis consider the changing value of the dollar?
- Were there significant cost problems or inefficiencies in the historical effort that would distort the estimate on the new effort?
- Have there been significant changes in technology or methods that would distort the estimate on the new effort?
- If the historical costs have been adjusted in any way, are the adjustments reasonable?
- Are there any significant differences in the material mix between the two efforts?
- Did the offeror assume any improvement from historical effort to the current effort? If not, why not? If so, does the estimate properly consider improvement curve theory?

Develop and Document Your Prenegotiation Position. As you develop and document your prenegotiation position on direct material cost:

- If you accept the offeror's summary estimate, document that acceptance.
- If you do not accept the summary estimate, document your concerns with the estimate and develop your own prenegotiation position for costs covered by the estimate.
- If you can identify information that would permit you to perform a more accurate analysis of material costs, use the available information. Your analysis is not bound by the estimating methods used by the offeror.

6.3 Analyzing Detailed Quantity Estimates

Detailed Direct Material Cost Estimates. A detailed cost estimate is more costly to develop and analyze than a summary estimate. However, when properly completed, the accuracy of a detailed estimate should compensate for the additional cost.

To prepare a detailed direct material cost estimate the estimator must first prepare an estimate of the material quantities required to complete the contract and then estimate the unit price for that material. Estimated material quantities will include the material that will become part of the product and any additional material required to compensate for material overruns, scrap, spoilage, and defective parts. Estimated prices must consider the total quantities required.

Bill of Materials (FAR Table 15-2). A bill of materials is a listing of all the materials, including the part numbers and quantities of all the parts required to complete the contract. When the contract is complex, there may be individual bills of material for different contract tasks or line items. If the estimate includes more than one task or item bill of materials, the offeror must submit a consolidated bill of materials for all items, with a breakdown suitable for analysis. The estimate must identify the item, the source, the quantity, and the price.

For supply and construction contracts, the estimator should estimate base material requirements for the bill of materials using contract drawings and specifications. Estimates of additional material requirements to compensate for material overruns, scrap, spoilage, and defective parts should be based on offeror experience and contract requirements.

Service contracts may not include drawings and specifications, but direct material quantity estimates will still be based on an analysis of contract requirements and offeror experience. These quantity estimates may be based on a detailed analysis of contract requirements or on comparisons with the material quantities actually required to complete similar contracts.

The table below presents an example of a priced consolidated bill of materials to produce 500 units of a
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Item and Source Information</th>
<th>Quantity per Assembly</th>
<th>Scrap Factor</th>
<th>Total Quantity</th>
<th>Unit Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>9876543</td>
<td>Housing casting. (Vendor: PIC Corp. PO 351522, issued 12/20, competitive)</td>
<td>1</td>
<td>4%</td>
<td>520 ea.</td>
<td>$84.72</td>
<td>$44,054.40</td>
</tr>
<tr>
<td>9876542</td>
<td>Bearing. (Vendor: Sun Co. PO 351480, issued 12/5, noncompetitive)</td>
<td>2</td>
<td>12%</td>
<td>1120 ea.</td>
<td>$14.87</td>
<td>$16,654.40</td>
</tr>
<tr>
<td>9876541</td>
<td>Gear, 14 tooth. (Vendor: AUTOCO, competitive)</td>
<td>4</td>
<td>8%</td>
<td>2160 ea.</td>
<td>$4.18</td>
<td>$9,028.80</td>
</tr>
<tr>
<td>9876540</td>
<td>Cable Assembly (Vendor: Rockway Corp., noncompetitive)</td>
<td>1</td>
<td>4%</td>
<td>520 ea.</td>
<td>$328.00</td>
<td>$170,560.00</td>
</tr>
<tr>
<td>9876539</td>
<td>Bracket, main. (Vendor: Cee Cee Corp., prior price was $22.19 ea. (PO 341110) 8% added in making estimate, two years since last</td>
<td>3</td>
<td>1%</td>
<td>1515 ea.</td>
<td>$23.97</td>
<td>$36,314.55</td>
</tr>
<tr>
<td>Item Code</td>
<td>Item Description</td>
<td>Quantity</td>
<td>Percentage</td>
<td>Unit Quantity</td>
<td>Unit Cost</td>
<td>Total Cost</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>------------</td>
<td>---------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>9876538</td>
<td>Race assembly. (Similar item bought 5/25 from HUP, Inc. for $150 ea. Engineering estimates that new item will cost 1/3 more)</td>
<td>1</td>
<td>2%</td>
<td>510 ea.</td>
<td>$200.00</td>
<td>$102,000.00</td>
</tr>
<tr>
<td>9876537</td>
<td>Solenoid. (Engineering estimate)</td>
<td>1</td>
<td>3%</td>
<td>515 ea.</td>
<td>$90.00</td>
<td>$46,350.00</td>
</tr>
<tr>
<td>9876536</td>
<td>Gear, drive. (Engineering estimate)</td>
<td>1</td>
<td>3%</td>
<td>515 ea.</td>
<td>$24.00</td>
<td>$12,360.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total Material</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>$437,322.15</strong></td>
</tr>
</tbody>
</table>

**Points to Consider When Analyzing Detailed Quantity Estimates.** As you conduct your analysis of detailed direct material quantity estimates:

- Give special attention to any direct material quantity concerns identified during your preliminary review of the material mix.
- Select a sampling strategy for analysis.
- Determine the reasonableness of the base estimate of direct material quantities required to complete the contract.
- Determine the reasonableness of any adjustments to the base estimate of direct material quantities required to complete the contract.
- Develop and document your prenegotiation position on direct material quantities required to complete the contract.

**Sampling Strategy for Analysis.** If the proposal includes only a few material items, you may have time to review all bill of materials items. For larger proposals with more items, you will probably need to limit your review to an item sample.

Consider using stratified sampling procedures that permit you to give more attention to high-value items, but still consider all bill of materials items. You can then adjust item estimates based on analysis results. A reduction to proposed costs is commonly called a **decrement**, and the percentage adjustment a **decrement factor**.

**For example:** You draw a sample from all material items with an extended cost of $1,000 or less. In analyzing that sample, you find that the sampled items are overpriced by five percent. The proposed cost...
of all items in the sampled stratum ($1,000 or less) should be reduced by five percent. The reduction is referred to as a decrement and the five percent is a decrement factor.

Determine the Reasonableness of the Base Estimate. The base quantity estimate is the quantity of material that will actually be used in the final product. Technical personnel should be able to verify this quantity by comparison with drawings and other relevant contract requirements.

Determine the Reasonableness of Any Adjustments. The actual direct material required to produce a product will likely exceed the material that will be included in the product. The reasons for this difference typically include material overruns, scrap, spoilage, and defective parts. All these costs are normally estimated using cost estimating relationships (CERs) based on the base estimates of direct material required to produce the product. Your analysis should center on assuring that the estimate is reasonable. Occasionally, a quantity adjustment is necessary to account for a minimum buy requirement. That is, the quantity required by the contract is less than the minimum quantity made available for purchase by the supplier. The minimum buy quantity can typically be verified by reviewing the supplier's quote. You may also assess the likelihood of another contract requiring the excess material, either on the acquisition date or at a later time through inventory. You should consider whether the adjustment should be reduced by the quantity expected to be used by the other contract(s).

In the bill of materials example above, examine the estimate for Part Number 9876543. A total of 520 parts must be purchased to complete assemblies requiring 500 parts. The additional 20 parts are estimated to be scrap.

Adjustment factors are normally based on accounting data and statistical analysis or other relevant experience. The most common method of calculation is a moving average, incorporating 6 to 12 months of data.

For example: CERs used to estimate the cost of scrap may be calculated using either dollars or units of material and are commonly calculated in one of the following ways:

<table>
<thead>
<tr>
<th>Scrap Dollars or</th>
<th>Scrap Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assembly Material Dollars</td>
<td>Total Assembly Material Units</td>
</tr>
<tr>
<td>Scrap Dollars or</td>
<td>Scrap Units</td>
</tr>
<tr>
<td>Material Dollars Purchased</td>
<td>Material Units Purchased</td>
</tr>
</tbody>
</table>

As you analyze any adjustments to the base bill of materials quantities, consider the answers to the following questions:

- If a CER (e.g., a scrap factor) is used to estimate adjustments, did the offeror consider the issues and concerns associated with CER development?

Quantitative Techniques for Contract Pricing (Volume II) identifies a series of questions related to issues and concerns that you should consider when evaluating any CER.

- Do you know what types of material costs are covered by the CER?

Material costs estimated using a CER must not duplicate material costs estimated using some other method. A CER developed to estimate the cost of scrap for electronic components should normally not be used to estimate the cost of scrap for metal components.

- Is the method used to apply the CER in the estimate consistent with the method used in rate calculation?

The independent variable used as a base for applying the CER (e.g., total assembly material dollars) must be the same as the base used to calculate the CER and the value of the independent variable must be calculated using the same procedures used in CER development.

- Does related estimate information indicate that the additional material amounts are consistent with past experience?

A CER or another method of adjustment may produce results that do not appear reasonable based on past experience. In such situations, consider the need for further analysis.

- Are the materials, tolerances, and processes similar to those used to calculate the CER?

Note that different items in the consolidated bill of materials example above have different scrap rates.
Some materials tend to produce more scrap than others in similar processes. Tighter tolerances tend to produce more scrap. Different processes produce different rates of scrap.

- Are the data used to calculate the CER changing over time?

Experience with the same material and processes should reduce scrap rates. Many CERs that are used to estimate additional material requirements are developed using moving averages to smooth variations in the data. A longer moving average (e.g., 12 months) may mask improvement. A shorter (e.g., 6 months) moving average will react faster to improvement, but may overreact to a random change in the data.

- Is the amount of the adjustment for material overruns, scrap, spoilage, and defective parts reasonable from a should-cost viewpoint?

The CER may be based on history, but does that history represent efficient and effective operations. Consider these related questions:

- Are potential process improvements that would reduce material cost considered by this adjustment?
- Would a different type, size, or shape of material reduce the need for this adjustment?
- What is the offeror doing to reduce the need for this adjustment?
- Does the proposal consider the residual value of the material overruns, scrap, spoilage, and defective parts?

Material that cannot be used for its intended purpose is probably not worthless, and the offeror must consider that residual value in the proposal. Depending on the offeror's accounting methods, this residual value may be credited directly to the contract or credited through an appropriate overhead rate reduction.

Develop and Document Your Pre-negotiation Position. As you develop and document your pre-negotiation position on direct material quantities, consider the following:

- If you accept the offeror's quantity estimate, document that acceptance.
- If you do not accept the quantity estimate, document your concerns with the estimate and develop your own pre-negotiation position for direct material costs covered by the estimate.
- If you can identify information that would permit you to perform a more accurate analysis of material costs, use the available information. Your analysis is not bound by the estimating methods used by the offeror.

6.4 Analyzing Unit Cost Estimates

Points to Consider When Analyzing Unit Cost Estimates. After you have established the quantity of material required to complete the contract, you must analyze the proposed unit costs. As you conduct your analysis:

- Give special attention to any direct material unit cost concerns identified during your preliminary review of the material mix.
- Determine if the offeror used an appropriate base for estimating unit material costs.
- Determine the reasonableness of material unit cost estimates based on current quotes.
- Determine the reasonableness of material unit cost estimates based on historical quotes or purchase prices.
- Determine the reasonableness of material unit cost estimates based on inventory pricing.
- Determine the reasonableness of interorganizational transfers.
- Develop and document your pre-negotiation position on unit costs for direct materials.

Determine Appropriateness of Estimating Bases. There are three general bases commonly used for estimating direct material unit prices for future contract performance. Use the following table as you determine whether the base used by the offeror is appropriate under the circumstances.
<table>
<thead>
<tr>
<th>Use estimates based on:</th>
<th>When the following conditions exist:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Quotes</strong></td>
<td>Work will be performed using materials not currently in inventory; Material prices may vary significantly from current inventory values; There is sufficient lead time to acquire materials being estimated; and There is sufficient proposal preparation time for the offeror to solicit and receive vendor quotes.</td>
</tr>
<tr>
<td><strong>Historical Quotes or Purchase Prices</strong></td>
<td>Work will be performed using materials not currently in inventory; Price changes (or lack of changes) between price history and contract performance are relatively or predictable; and There is sufficient lead time to acquire materials being estimated. (Note: This method is particularly appropriate when there is insufficient proposal preparation time for the offeror to solicit and receive vendor quotes.)</td>
</tr>
<tr>
<td><strong>Inventory Pricing</strong></td>
<td>Work will be performed by using materials in the existing inventory.</td>
</tr>
</tbody>
</table>

**Analyzing Current Quotes.** As you evaluate the reasonableness of material unit cost estimates based on current quotes, consider the answers to the following questions:

- Are the quotes for quantities required to complete the contract?

Make sure the vendor quotations match the quantities necessary for the proposed work. For example, if 1,000 units of a part are needed, the quote should be based on 1,000 units. If the offeror is proposing to make five purchases of 200 units, the units are likely to be overpriced, because larger quantity purchases usually mean lower unit prices.

**Exceptions.** There are two general exceptions to this rule.

- If the items being estimated are used on more than one contract, quantities for all parts required during the time period should be combined in order to obtain the best possible prices through quantity purchasing.

- If the increased cost of holding the product exceeds the potential savings from quantity procurement. Then the contractor may be able to justify buying the product in smaller lots at different times in the production process.

- Did the proposal consider probable negotiated price reductions?

If the offeror has a history of negotiating reductions from subcontract price quotes, the proposed material price should reflect the historical proposal reduction (decrement). Even when multiple prospective subcontractors have submitted “competitive quotes,” be on the lookout for purchase orders placed at prices less than the quote.

Most contractors will try to negotiate reductions even with competitive quotes. Techniques the offeror may employ to reduce quoted prices include: asking vendors for another round of best and final offers; continuing negotiations; switching to a lower priced vendor; and increasing order quantities to gain quantity discounts.

If the proposal did not consider negotiated price reductions, consider developing your own decrement factor. For example, if history shows that the offeror commonly negotiates prices five percent below the prices subcontractors propose, you could use a five percent decrement factor to consider the anticipated reduction.
Did the proposal properly consider subcontract terms and conditions?

Sometimes, special conditions in the business arrangements between the offeror and vendor result in savings to the offeror. These savings should be passed on to the Government. Some examples include:

- **Quotations with escalation already included.** Sometimes the offeror will ask a vendor to quote prices for orders placed over an extended period of time. The vendor will most likely include some escalation in the price for cost increases. While this is acceptable, it would be unacceptable for the offeror to add an additional escalation factor to a vendor quote that already includes escalation for the same period of time.

- **Quantity discount rebates.** Occasionally, you may see an arrangement where the vendor will charge a set price on each individual order and at the end of the year offer a rebate based on the total quantity purchased. If the Government pays the individual order price, the contractor could realize excessive profits through the rebate. The offeror should project the estimated quantity for the year and discount the current quote considering the estimated amount of the rebate or use the estimated rebate to reduce any indirect cost related to material.

- **Prompt Payment and Other Discounts.** Suppliers sometimes offer a discount for prompt payment or other trade discount or credit. Typically such discounts are identified on the supplier's quote. These discounts may be accounted for either by reducing the material estimate directly or by crediting indirect costs. If a discount is available and the contractor declines to participate, the contractor should demonstrate that doing so is reasonable (FAR 31.205-26(b)(2)).

- **Priced options.** While the offeror may propose a current quote, there may be an existing order with a priced option for additional quantities at a price lower than the current quote. The price the offeror really expects to pay the vendor is the lower priced option price, and that is the price that should be used to estimate direct material cost.

- Has the prime contractor completed subcontract negotiations?

  You will likely find it harder to negotiate price reductions after the offeror has agreed to a subcontract price. However, if the subcontract has been negotiated, do not accept a subcontract cost that you believe is unreasonable just because the price has been negotiated.

- **Will some (or all) of the contract material come from existing inventory?**

  Determine if the offeror will purchase the entire quantity or if some of it will come from existing inventory. Remember that the inventory value may be less than the current market price.

- **Are there any other significant price-related factors that should be considered in estimating direct material unit cost?**

  Determine what price-related factors are built into (or excluded from) the material quotes. For example, if a quote includes surface transportation cost to the prime's plant, do not accept additional surface transportation cost estimates for that material.

- **What is the nature and adequacy of the subcontract price competition?**

  In your evaluation of subcontract competition, ask the same questions about the existence and adequacy of price competition that you would ask in evaluating offers for a Government contract. If the number of competitive quotes is less than expected, inquire as to how many potential suppliers were asked to provide a quote. Solicitation responses are not always received promptly. Consider that a lower priced quote may have been submitted after the proposal was developed. In evaluating the extent of competition, you should also consider the effect of any common ownership arrangements, either between the contractor and subcontractor or between any of the solicited subcontractors.

- **How do quotes compare with commercial prices, historical prices, pricing yardsticks, or Independent Government Estimates?**

  Be wary of subcontract quotes that are substantially different than commercial prices, historical prices, pricing yardsticks, or Independent Government Estimates. Ask the offeror to explain the differences, and, in light of those differences, justify the reasonableness of the quoted prices.

*Analyzing Historical Quotes or Purchase Prices.* As you evaluate the reasonableness of material unit cost estimates based on current quotes, consider the answers to the following questions:
Was the historical quote or subcontract price reasonable?

Be cautious as you review material unit cost estimates based on vendor quotes or contract prices paid by the prime contractor. Such estimates assume that the historical price was reasonable. That may not be true. If you have questions, review the offeror’s subcontract files and related market information.

- Are there other historical quotes or subcontract prices that support or refute the reasonableness of the estimated price?

Verify that the subcontract price quote used by the offeror is not unusually high (or unusually low) for the quantity required. For example, the most recent purchase may have been at a relatively higher unit price because the contractor acquired an unusually low quantity.

- Are current material item requirements the same as the historical requirements?

Changes in specifications can affect material prices. If a particular process, inspection, or specification has been eliminated, the cost of producing the item will most likely drop. If this circumstance exists, the historical price must be adjusted accordingly.

- How has the offeror’s specific purchasing situation changed?

You need to understand the contractor’s acquisition situation as it existed in the previous purchase and how the current acquisition situation differs. As a minimum, you should consider the probable affect of changes in:

- Number of sources;
- Quality of sources and competition;
- Quantities purchased;
- Production / delivery rates;
- Start-up costs; and
- Terms of purchase.

- Has the item's production status changed?

Item prices typically decrease when a part is in continuous production. If the item was in continuous production, but is no longer produced, the vendor may incur start-up costs to begin manufacturing the item again. If an item's production status has changed, the estimator should either adjust historical prices to consider start-up costs and related inefficiencies or use another base to estimate direct material cost. Remember that the opposite situation can also occur. If the last purchase included nonrecurring costs (e.g., tooling, set-up, or first article expenses) that should not be charged again. The cost of the current item should reflect only recurring production costs.

- How has the general economic situation changed?

Economic changes are reflected in the general level of inflation or deflation related to the material item. Price index numbers can be invaluable to you in analyzing price changes.

- Has the contractor applied an escalation factor?

It is not always practical for a contractor to purchase and accept delivery of all required material early in the contract performance period. In these cases, multiple purchases of direct material may be made throughout contract performance and the purchase price may vary. Therefore, a contractor may apply an escalation factor to historical material costs to estimate the anticipated purchase price. Generally, material prices increase over time, but this is not always true, particularly with some hi-tech component parts where obsolescence is rapid.

In evaluating the reasonableness of proposed escalation you should consider the time-phased schedule of material requirements, the validity period of the supplier's quoted price, actual historical price fluctuation of the material, management-approved plans, and forecasted economic conditions.

- Is there more recent pricing information available?

Be alert to possible discrepancies between estimating system information and the purchasing system information. The offeror should always provide you with the most up-to-date information. However, if the
firm's estimators do not communicate effectively with the firm's buyers, the estimators may still be relying on historical costs even though the firm's buyers have obtained current quotes and prices. Analyzing Inventory Pricing (FAR 31.205-26(d) and Appendix B, 9904.411-50). When the firm intends to use existing inventory to perform the contract, the direct material estimate should be based on one of the five acceptable methods of inventory pricing: first-in-first-out, last-in-first-out, weighted average, moving average, and standard cost. As you evaluate the reasonableness of material unit cost estimates based on inventory pricing, consider whether the offeror consistently uses one (and only one) of those acceptable methods.

- **First-in-first-out (FIFO)**. This method of inventory pricing works just as the name implies. For accounting purposes, you assume that the first unit into the inventory is the first unit to be drawn out. The inventory value assigned to the unit drawn out is the value of the first unit recorded as still being in inventory. It does not matter which unit is physically drawn out of inventory. It could actually be the last unit added to inventory. Under FIFO, the value assigned would still be that of the first unit recorded as being on-hand.

*For example:* A firm using FIFO has five widgets in inventory. The following are the acquisition costs in order of receipt:

- Unit A @ $100
- Unit B @ $110
- Unit C @ $105
- Unit D @ $115
- Unit E @ $120

During the year, the firm performs three jobs requiring one widget each. Direct material costs for each job would be:

- Job 1 cost = $100
- Job 2 cost = $110
- Job 3 cost = $105
- Unit D @ $115
- Unit E @ $120

The remaining inventory value would be $235 ($115 + $120).

- **Last-in-first-out (LIFO)**. As with FIFO, LIFO is what the name implies. Pricing is based on the assumption that the last, or most recent unit received, will be the first drawn out. Using the same situation as above, but with LIFO, you would get the following:

*For example:* A firm using LIFO with the following five widgets in inventory and three jobs requiring one widget each would have the direct material cost indicated for each job:

- Unit A @ $100
- Unit B @ $110
- Unit C @ $105
- Unit D @ $115
- Unit E @ $120

The remaining inventory value would be $210 ($100 + $110).

- **Weighted Average.** Under this method inventory unit prices are recalculated at designated times during the year (e.g., quarterly). The weighted average is calculated by dividing the total cost of the inventory on-hand by the number of units on-hand.

*For example:* A firm using the weighted average method of inventory pricing with the five widgets below in inventory and three jobs requiring one widget each would have a direct material cost of $110 for each job.

- Unit A @ $100
- Unit B @ $110
- Unit C @ $105
- Unit D @ $115
- Unit E @ $120

Total $550 for five units

The inventory price for each widget would be the weighted average $110 ($550/5). Note: In this example, the weighted average price is the same as the simple average price because there is only one unit at each unit price.
The remaining inventory value would be $220 ($110 x 2).

- **Moving average.** A moving average is calculated in the same way as a weighted average except that the calculation is done every time there is a new addition to inventory.

**For example:** Five widgets listed in the Original Inventory below are in inventory. During the year, three jobs were performed requiring one widget each. After the completion of Job 1, an additional unit was added to inventory, and inventory prices recalculated.

**Original Inventory:**
- Unit A @ $100  Job 1 cost = $110
- Unit B @ $110
- Unit C @ $105
- Unit D @ $115  Unit E @ $120
- Total $550 for five units

The inventory price for each of the original five widgets would be the weighted average $110 ($550/5).

**Inventory after Completion of Job 1 and addition of Unit F:**
- 4 Units @ $110 = $440  Job 2 cost = $112
- Unit F @ $120 = $120  Job 3 cost = $112
- $560

The new moving average price would be $112 ($560/5).

The remaining inventory value would be $336 ($112 x 3).

- **Standard cost.** Under this method of inventory pricing, the value of inventory equals the number of units times the unit standard cost. Standard costs are usually based either on expected prices for the period in question (sometimes as short as a week) or on prices prevailing at the time the standards are set. Standard costs do not change in response to short-term fluctuations in volume, quantity, or unit costs.

The difference between the acquisition cost and standard cost of inventory units is called a variance. Variance adjustments may be handled by making cost adjustments on each job, or if the cost is insignificant, it can be done as an overhead adjustment. If the variance is absorbed in overhead, determine that the same standards are used by all contracts, particularly commercial and government. In addition, verify that the material requirements are roughly identical between commercial and government contracts. If commercial requirements differ, assess the risk that standards have been set artificially low for the material associated with commercial contracting. Low standards create higher variance costs, which are then allocated through the overhead adjustment to all contracts.

There may be substantial differences between contractor inventory standard cost systems. If you encounter an inventory standard cost system, ask the contractor to identify the source of the applied standards and to explain any variances. Where possible, contact the cognizant Government auditor for assistance.

**Interorganizational Transfers (FAR 15.403-1(b) and FAR 31.205-26(e)).** Interorganizational or interdivisional transfers are materials, supplies, or services that are sold or transferred between divisions, subsidiaries, or affiliates of the contractor under a common control. They require special analysis because any profit included in an interorganizational transfer permits a contractor to pyramid profits by including profit (for other elements of the overall firm) in contract costs. A firm could conceivably create more divisions and transfer material back and forth between those divisions to further increase total profit for the total corporate entity.

- **Transfers at cost.** To prevent contractors from pyramiding profits using interorganizational transfers, the Government has adopted the policy that interorganizational transfers must be made at cost. In other words, the transfer must not include any profit for the division, subsidiary, or affiliate making the transfer. Furthermore, the costs of that division, subsidiary, or affiliate are subject to audit and analysis, just like any other contractor costs.

- **Transfers at price.** However an interorganizational transfer may be made at price (with profit), when all of the following four conditions are met:
  - It is the established practice of the transferring organization to price interorganizational transfers at other than cost (with profit) for commercial work of the contractor or any division, subsidiary, or affiliate of the contractor under common control.
The item being transferred qualifies for an exception to statutory requirements for cost or pricing data.

When the transfer price is based on a catalog of market price, the price should be adjusted to reflect the quantities being acquired and may be adjusted to reflect the actual cost of any modifications necessary because of contract requirements.

The contracting officer does not determine that the price is unreasonable.

### 6.5 Recognizing Subcontract Pricing Responsibilities

**Privity of Contract Concept.** The term "privity of contract" refers to the direct relationship that exists between contracting parties.

- The Government has a contract with the prime contractor, therefore there is privity of contract between the Government and the prime contractor.

- The prime contractor has a contract with its subcontractors, so privity of contract exists between the prime contractor and its subcontractors.

- However, the Government does not have a contract with any subcontractor, so no privity of contract exists between the two parties. Since no privity of contract exists, you cannot:
  - Negotiate directly with the subcontractor; or
  - Direct the subcontractor to take any action.

While the Government has an interest in the activities and performance of the subcontractors, you must be careful not to violate the contractual relationship.

**Responsibility to Analyze Subcontract Proposals (FAR 15.404-3(b)).** The firm awarding the subcontract (the offeror or a higher-tier subcontractor), is responsible for subcontract pricing. At the same time, the contracting officer is responsible for the total price paid by the Government, and must be satisfied that each subcontracting tier has performed an adequate cost or price analysis of each subcontract proposal. Part of that responsibility is to assure that the subcontracting activity has performed an appropriate price or cost analysis.

- **Price Analysis.** The firm awarding a subcontract must perform a price analysis when no cost analysis is performed and should perform a price analysis in conjunction with any cost analysis to ensure overall price reasonableness. This analysis should be similar to one that you would perform in pricing a similar contract under similar circumstances.

- **Cost Analysis.** The firm awarding a subcontract must analyze:
  - Any required subcontractor cost or pricing data, and
  - Any subcontractor cost information other than cost or pricing data required to determine cost reasonableness or cost realism.

The firm awarding a subcontract must include the results of these analyses as part of its own cost or pricing data submission. Lower-tier subcontract analyses become part of higher-tier submissions, and eventually the prime contractor's submission to the Government.

The results of these analyses should help the firm awarding the subcontract to arrive at a fair and reasonable subcontract price. Those same results should provide you with information that will help you arrive at a fair and reasonable contract price. Consider a firm's failure to analyze subcontract costs as a potentially significant estimating system deficiency. If you believe that an analysis is inadequate or that the subcontract price is unreasonable, question the costs involved. Remember that a firm's failure to perform and submit an adequate analysis could lead to contract overpricing.

**Responsibility to Obtain Subcontract Cost or Pricing Data (FAR 15.404-3(c)).** Unless the subcontract qualifies for an exception to statutory cost or pricing data requirements, any contractor or subcontractor required to submit cost or pricing data must also obtain cost or pricing data before:

- Awarding any subcontract or purchase order expected to exceed the cost or pricing data threshold, or
• Issuing any modification with a price adjustment amount expected to exceed the cost or pricing data threshold.

Responsibility to Submit Subcontract Cost or Pricing Data (FAR 15.404-3(c)). An offeror required to submit cost or pricing data to the Government must also submit (or cause submission of) cost or pricing data from prospective subcontractors in support of each subcontract priced at the lower of either:
• $11,500,000 or more, or
• Both more the cost or pricing data threshold and more than 10 percent of the prime contractor's proposed price, unless the contracting officer believes such submission is unnecessary.

The contracting officer may require subcontractor cost or pricing data below these thresholds when the data are considered necessary for adequately pricing the prime contract.

Exceptions to Subcontract Cost or Pricing Data Requirements (FAR 15.404-3(c)). If you are satisfied that a subcontract will be priced on the basis of one of the exceptions to statutory requirements for cost or pricing data, do not require submission of subcontract cost or pricing data.

If the subcontract estimate is based upon the cost or pricing data of the prospective subcontractor most likely to be awarded the subcontract, do not require submission to the Government of data from more than one proposed subcontractor for that subcontract.

Responsibility to Support Subcontract Estimates (FAR 15.404-3). Require the offeror to support subcontractor cost estimates below the cost or pricing data threshold with any data or information (including other subcontractor quotations) needed to establish a reasonable price.

To provide adequate cost estimate support, the offeror may need to obtain information other than cost or pricing data from prospective subcontractors.

Responsibility for Updating Subcontract Cost or Pricing Data (FAR 15.404-3(c)(4)). The offeror is responsible for assuring that subcontractor cost or pricing data are accurate, complete, and current as of the date of price agreement or, if applicable, another date agreed upon between the parties, given on the contractor's Certificate of Current Cost or Pricing Data. Accordingly, the offeror is also responsible for updating a prospective subcontractor's cost or pricing data.

Remember that subcontract proposals are an integral part of prime contract proposals. As a result, when a prospective subcontractor's cost or pricing data are not accurate, complete, and current, the prospective prime contractor's proposal cannot be accurate, complete, and current.

Long Term Agreements. A Long Term Agreement (LTA) is an agreement entered into between a prime contractor and a subcontractor to establish pricing for future purchases of specified items or services. LTAs are an acceptable pricing method since FAR 15.404-3(c) allows a contractor to reach price agreement with a subcontractor in advance of agreement with the Government. It is not uncommon for contractors to enter into an LTA with a subcontractor in advance of a specific Government Request for Proposal.

You should not assume that the price resulting from an LTA was necessarily reasonable at the time of execution nor should you assume that it continues to be a reasonable price. It should be noted that the existence of an LTA negotiated prior to a prime contract award does not relieve the contractor of its responsibility to obtain and analyze certified cost or pricing data prior to subcontract award when required by FAR 15.404-3(c). You should evaluate the contractor's analysis of cost or pricing data at the time the LTA was established while also considering the procedures performed by the contractor to demonstrate that the LTA price continues to be fair and reasonable (e.g., capable competitors may have entered the market since the LTA was executed).

7.0 Chapter Introduction

This chapter identifies points to consider as you develop your prenegotiation position on direct labor costs. Analysis Responsibility (FAR 15.402(a) and 15.404-2(a)). The contracting officer has the ultimate responsibility for determining price reasonableness, but no one expects the contracting officer to be an expert in all the accounting and technical issues associated with direct labor cost analysis. However, you are expected to know who to ask for assistance and when.

Flowchart of Direct Labor Cost Analysis. The following flowchart depicts the key events completed as part of a typical direct labor cost analysis.
7.1 Identifying Direct Labor Costs For Analysis
This section presents points that you should consider as you identify direct labor costs and plan for further analysis.
- 7.1.1 - Identifying Direct Labor Classifications
- 7.1.2 - Identifying Major Types Of Direct Labor
- 7.1.3 - Planning For Further Analysis

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7.1.1 Identifying Direct Labor Classifications
Labor Classification System. Each offeror should have a position classification system which serves as a guide for personnel selection and assignment. This system should provide both contractor and Government members of the Acquisition Team with information on relevant position descriptions, position classes, and the position classification plan. That information can prove invaluable as you and other Government personnel evaluate the appropriateness of proposed labor estimates. In other words, this system can help you and other Government personnel determine if employee qualifications match contract requirements.
For example: When auditors perform formal contractor employee compensation reviews, they compare the firm's personnel classification data and related compensation with the compensation paid for similar skills by other firms in the local area.
**Position Description.** A position description is the documentation of the types of work (i.e., duties and responsibilities) assigned to an employee. Most firms should be able to produce a position description for each position. That description should identify specific position duties and responsibilities, as well as, qualification requirements (e.g., the required experience, skills, knowledge, and educational need to work in the position).

**Position Class.** A position class is a grouping of all positions that share the same title and pay level. For example, "Senior Electrical Engineer - Pay Level IV" is the title assigned to a class of positions. Normally, positions are assigned the same title and pay level only if the workers in the positions perform duties that:

- Are comparable in kind or subject matter;
- Are at the same levels of difficulty and responsibility; and
- Require the same basic qualifications.

**Position Classification Plan.** Sometimes called job evaluation plans, position classification plans identify the classes of labor employed by the firm and provide guidelines for determining the title and pay level of each position in the firm. Guidelines are generally in the form of job factors, degree requirements, skill qualification requirements, and conversion tables (such as the possible trade-offs between education and experience).

The position classes and labor rates identified in the proposal should be consistent with the offeror’s classification plan. In other words, the offeror should not propose a top scientist to perform the type of work normally assigned to a journeyman engineer.

If an offeror does propose a top scientist to perform work normally assigned to a journeyman engineer, question the related excess cost. However, a top scientist may be acceptable if the offeror can demonstrate related savings, such as a reduction in the total labor hours required.

### 7.1.2 Identifying Major Types Of Direct Labor

**Labor Cost.** The amount and types of labor required to complete a contract will vary based on contract requirements. To complete a supply contract, the contractor will likely require engineers, manufacturing personnel, and a wide range of support personnel. A service contract might require a wide variety of personnel depending on contract requirements. Of course, most contracts will require personnel involved in administration and support of contract operations.

**Direct vs. Indirect Labor Cost (FAR 31.202 and 31.203).** Most contracts require both direct and indirect labor. However, you will find that accounting and estimating treatment will vary from firm to firm.

- **Direct Labor Cost.** A direct labor cost is any labor cost that can be identified specifically with a final cost objective (e.g., a particular contract).
  - Labor costs identified specifically with a particular contract are direct costs of the contract and must be charged to that contract.
  - Labor costs must not be charged to a contract as a direct cost if other labor costs incurred for the same purpose in like circumstances have been charged as an indirect cost to that contract or any other contract.
  - All labor costs specifically identified with other contracts are direct costs for those contracts and must not be charged to another contract directly or indirectly.

- **Indirect Labor Cost.** An indirect labor cost is any labor cost not directly identified with a single final cost objective, but identified with two or more final cost objectives or an intermediate cost objective. For reasons of practicality, any direct labor cost of minor dollar amount may be treated as an indirect cost if the accounting treatment:
  - Is consistently applied to all final objectives, and
  - Produces substantially the same results as treating the cost as a direct cost.

**Common Direct Labor Categories.** While each offeror will have different terminology and different ways of categorizing its labor force, the two most common and largest types of direct labor in manufacturing contracts are engineering and manufacturing labor. The labor categories in service contracts are much...
more diverse.

**Engineering Labor.** Engineering involves a variety of activities associated with product research, product design, and the development of manufacturing methods and procedures. Most engineering activity is typically charged as a direct labor cost. However, the efforts of supervisors and many engineering support personnel may be charged as indirect costs. Assure that the offeror is consistent in charging these costs as direct or indirect. If you have any question about proper cost treatment, contact the cognizant Government auditor for advice and assistance. The following table presents descriptions of some of the most common engineering labor classifications.

<table>
<thead>
<tr>
<th>Examples of Engineering Classifications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Engineer</td>
<td>Involves delineating the end-product's characteristics and specifications</td>
</tr>
<tr>
<td>Manufacturing Engineer</td>
<td>Involves manufacturing planning, process instructions &amp; work methods, shop loading, organizing work stations, and matching shop capabilities to contractual requirements</td>
</tr>
<tr>
<td>Reliability Maintainability Engineer</td>
<td>Involves designing and manufacturing products to meet longevity and repair requirements</td>
</tr>
<tr>
<td>Quality Assurance Engineer</td>
<td>Involves the formulation of standards and specifications for tests and inspections</td>
</tr>
<tr>
<td>Sustaining Engineer</td>
<td>Involves &quot;as needed&quot; support as problems arise throughout the life of the contract</td>
</tr>
</tbody>
</table>

**Manufacturing Labor.** Manufacturing labor is the effort required to actually produce an item. Most manufacturing labor cost is a "hands-on" direct cost. Some types of manufacturing direct cost (e.g., inspection), may be allocated to each job as an indirect cost. Depending on the circumstances and contractor accounting procedures, supervision may be a direct or an indirect cost. As with engineering labor, assure that the offeror is consistent in charging these costs as direct or indirect under similar circumstances. If you have any question about proper cost treatment, contact the cognizant Government auditor for advice and assistance. The following table presents examples of some of the most common manufacturing labor classifications.

<table>
<thead>
<tr>
<th>Examples of Manufacturing Classifications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabrication Labor</td>
<td>Involves the fashioning of parts from raw or purchased materials</td>
</tr>
<tr>
<td>Assembly Labor</td>
<td>Involves the effort to combine parts into subassemblies and assemblies</td>
</tr>
<tr>
<td>Quality Control Labor</td>
<td>Involves the act of testing or inspecting the product during the manufacturing process and prior to final acceptance</td>
</tr>
</tbody>
</table>

**Services Labor** (FAR 37.101). A service contract directly engages the time and effort of a contractor whose primary purpose is to perform an identifiable task rather than to furnish an end-item of supply. It can require professional or nonprofessional personnel on a individual or organizational basis. The classes of labor effort required for contract performance will vary widely based on the tasks that must be performed to complete the contract. Tasks might include any of the following:

- Maintenance, overhaul, repair, servicing, rehabilitation, salvage, modernization, or modification of supplies, systems, or equipment;
- Routine recurring maintenance of real property;
• Housekeeping and base services;
• Advisory and assistance services;
• Operation of Government-owned equipment, facilities, and systems;
• Communications services;
• Architect-engineering services;
• Transportation and related services;
• Research and development; or
• Other services.

The service contract solicitation may define labor categories which the offeror must use in proposal preparation and contract performance (e.g., senior engineer or senior analyst). To comply with these solicitation-defined labor categories, the offeror may need to use a blend of personnel from more than one of the firm's position classes. In such cases, the offeror should identify the labor classifications that were blended to meet solicitation requirements. The blended labor-rate should correspond to the blend of skills required.

If you have any question about proper cost treatment, contact the cognizant Government auditor for advice and assistance.

7.1.3 Planning For Further Analysis

Points to Consider. As you prepare your plan for direct labor cost analysis, look for indicators of uneconomical or inefficient practices. Consider the results of any technical analyses. If an element of proposed direct labor cost appears suspicious, concentrate more analysis effort on that element than on a less suspicious cost element of similar dollar value. As you plan:
• Identify and evaluate the methodology used by the offeror to estimate direct labor cost.
• Identify any proposed direct labor cost that does not appear reasonable.
• Identify any proposed direct labor cost that should be classified as an indirect cost.
• Identify any proposed direct labor cost that merits special attention because of high value or other reasons.
• Assure that preliminary concerns about direct labor cost estimates are well documented.

Identify and Evaluate Estimating Methodology. To identify and evaluate the methodology used by the offeror to estimate direct labor cost, ask questions such as the following:
• What basis did the offeror use to estimate direct labor cost?

Labor cost estimates normally include estimates of both labor hours and a labor-rate for each position classification. Estimates may be developed using round-table, comparison, or detailed estimating techniques.
• Does the methodology appear appropriate for the current estimating situation?

The method selected should use the information available to produce reasonable and equitable results. If the methodology used by the offeror does not appear appropriate, consider using a different methodology to develop your pricing position.

Identify any Cost That Does Not Appear Reasonable. To identify any proposed direct labor cost that does not appear reasonable, ask questions such as the following:
• Is the proposed labor effort consistent with the offeror’s estimating assumptions?

If any part of the estimate is not consistent with stated estimating assumptions, question the costs involved.
• Is the proposed labor effort necessary to complete the contract?

Require the offeror to support the need for any direct labor cost that does not appear needed to complete contract tasks.
• Has the offeror accounted for all types of labor reasonably required to complete the contract? Compare the contract task requirements with the skills proposed by the offeror. If the proposed labor cost does not include personnel with adequate qualifications to perform a specific task, question the labor cost for that task.
• Are the proposed labor classes and pay levels consistent with the firm's position classification plan?

If the proposed labor classes are not consistent with the offeror's position classification plan, it is likely that the proposal was not prepared in accordance with the firm's normal estimating procedures. Such proposals may include inflated labor costs or proposed personnel that do not have the knowledge, skills, and experience required to complete the contract.
• Are position class qualifications consistent with the knowledge, skills, and experience required to complete identified contract tasks?

When less-qualified personnel are assigned to tasks requiring higher qualifications, contract performance risk increases. Performance may even be impossible with the identified personnel. Assignment of high-skilled personnel with higher labor rates to tasks that can be efficiently completed by less-qualified personnel needlessly increases contract cost unless their higher qualifications increase performance efficiency enough to compensate for the higher labor rates.
• Do the proposed labor classes and wage levels meet solicitation requirements?

Many service solicitations identify the types of skills needed to perform the contract. If proposed personnel fail to meet minimum solicitation requirements, the offeror's proposal will likely be unacceptable. If you accept unnecessarily high skilled personnel, contract cost increases unless their higher qualifications increase performance efficiency enough to compensate for the higher labor rates.
• Does the proposal include labor to complete the same task more than once?

Watch for task overlaps. For example, in writing technical publications and manuals, the proposal should clearly define where the responsibilities of the design engineer for preparing drawings, supporting materials, and documentation end and the responsibilities of the technical writer to transform these materials into a document begin. If the different tasks are not clearly defined, it is possible that both engineering and technical writing estimates may include estimated hours to perform the same work.
• Does the proposal include labor to complete work being performed under a related contract?

Occasionally an offeror will propose work that is actually performed under a related contract. Tasks that cross different contracts in the same project/program (e.g., project administration) are particularly susceptible to such overlaps.
• Is the proposed labor mix consistent with the historical mix for the task?

If the mix of labor used to complete past contracts is substantially different than the proposed mix, the proposal should explain why the change is necessary and reasonable. Even if the mix is consistent with the past, you may want to consider whether there should be a change. For example, when a product is new, contract performance may require more highly skilled engineers. As a product matures and moves into the later stages of its product life cycle, fewer and less skilled (and less expensive) engineers may be more appropriate.
• Does the proposed labor mix represent the firm's available work force, or the skill mix actually needed to complete the contract?

Be careful when the proposed labor is a better representation of the skill mix in the offeror's work force than the skill mix required to complete the contract. The offeror may not understand the work required to complete the contract. Alternatively, the offeror may be overestimating the work required to complete the contract.
• Do the labor hours proposed for any labor classification exceed the offeror hours available in that classification?

Occasionally an offeror will propose more hours in a particular position classification than the firm has available in that classification. When that happens assure that the estimate includes information on how the offeror will obtain the skilled personnel required to complete the contract.

Identify Any Proposed Direct Labor Cost That Should Be Classified As an Indirect Cost. To identify any
proposed direct labor cost that should be classified as an indirect cost, ask questions such as the following:
- Has the offeror consistently treated this type of labor as a direct cost?

Similar costs incurred under similar circumstances should be charged in the same way. For example, if labor cost for shop expediter is normally charged as an indirect cost, then shop expediter labor cost for similar expediting effort should always be charged as an indirect cost. Be careful, a technical evaluator may object to classifying a cost (e.g., shop expediter labor cost) as a direct cost because other firms classify similar labor as an indirect cost. However, the issue is not how other firms classify the cost but rather how the offeror's estimating and accounting systems treat the cost.
- Do the personnel projected to the work on this contract charge their time as a direct or an indirect cost under similar circumstances?

If similar costs are charged as a direct cost on one occasion and as an indirect cost on another occasion, the Government may be double charged for similar costs (once as a direct cost and once as an indirect cost). One way to quickly check if this type of labor should be a direct or indirect cost is to review the time cards of personnel projected to work on the contract. If an employee is currently charging time to a charge number that goes to an overhead account, you should determine how the situation will change under the proposed contract. If you have any questions, contact the cognizant Government auditor.
- Will each labor hour proposed for this contract benefit only this contract?

There may be situations where an employee is charging part-time to each of several contracts and part-time to overhead (e.g., a lead engineer who does both team management tasks and "hands-on" design work). Only those hours proposed for specific contract tasks should be recognized as a direct cost. Any indirect contract support (e.g., as team management) will be covered by application of overhead rates.
- Is it practical to account for this labor as a direct cost?

Good cost accounting practices will specifically identify a direct contract cost to the appropriate contract whenever it is practical. However, a minor direct cost may be treated as an indirect cost if the accounting treatment:
- Is consistently applied to all contracts, and
- Produces substantially the same results as treating the cost as a direct cost.

If you have a question concerning whether a cost should be a direct cost or is already covered in an overhead account, seek assistance from the cognizant Government auditor.

Identify Direct Labor Costs Which Merit Special Attention. To identify any proposed direct labor cost that merits special attention because of high proposed cost or other reasons, ask questions such as the following:
- Is the direct labor estimate for any task a large portion of the entire direct labor cost estimate?

Many times a single task estimate will be a large part of the entire estimate. That estimate will normally merit special attention because of the dollars involved.
- Is any direct labor effort uniquely critical to contract performance?

Many times the direct labor effort for a specific task or group of tasks will be uniquely critical to contract performance, because of schedule or technical requirements. Related cost estimates may merit special attention, to assure offeror understanding of the task. Document Concerns About Direct Labor Cost Estimates. To assure that concerns about direct labor cost estimates are well documented, ask questions such as the following:
- Have you identified concerns about direct labor cost estimates?
- If the answer is "yes" document the areas of concern for reference as you perform more in-depth analysis.
- Has the offeror had an opportunity to answer your concerns?

Consider raising these concerns in fact-finding conversations with the offeror. If the problem is an error in the proposal, bring the error to the offeror's attention so that it can be corrected prior to formal negotiations.
7.2 Analyzing Labor-Hour Estimates
This section identifies points to consider as you analyze direct labor-hour estimates.

- 7.2.1 Analyzing Round-Table Estimates
- 7.2.2 Analyzing Comparison Estimates
- 7.2.3 Analyzing Estimates Developed Using Labor

Standard Steps for Labor-Hour Estimate Analysis. The points that you consider in your analysis will not be the same for every estimate. However, there are general steps that you should follow as you conduct your analysis of direct labor-hour estimates:

- Give special attention to any direct labor-hour concerns identified during your preliminary review of direct labor cost estimates.
- Determine whether the estimating method is appropriate for the estimating situation.
- Determine whether the estimating method was properly applied.

Develop and Document Your Prenegotiation Position. As you develop and document your prenegotiation position on direct labor hours:

- If you accept the offeror's labor-hour estimate, document that acceptance.
- If you do not accept the labor-hour estimate, document your concerns with the estimate and develop your own prenegotiation position for costs covered by the estimate.
- If you can identify information that would permit you to perform a more accurate analysis of direct labor-hours, use the available information. Your analysis is not bound by the estimating methods used by the offeror.

7.2.1 Analyzing Round-Table Estimates
Round-Table Estimates. Experts develop round-table labor-hour estimates based on their experience and judgment without using detailed drawings or a bill of materials, and with limited information on specifications.

Determine If a Round-Table Estimate Is Appropriate. To determine whether use of a round-table estimate is appropriate for the estimating situation, ask questions such as the following:

- Are there sufficient information and historical data available for use of a more accurate cost estimating method?

Round-table estimating should only be used in situations where detailed drawings, bills of material, and firm specifications are not available. Carefully scrutinize all round-table estimates to assure that sufficient information and historical data are not available for use of cost estimating method that typically produces more accurate results.

- Does the offeror commonly use round-table estimates in similar estimating situations?

Round-table labor-hour estimates are most commonly used for research and development contracts and other contracts that will require the offeror to perform tasks that are not well defined at the time the estimate is prepared.

- Does the cost involved warrant a more detailed estimate?

For a small dollar amount, a round-table estimate may be acceptable, because the cost risk involved does not warrant the collection the data required for use of another estimating method.

Determine If The Round-Table Estimate Was Properly Developed And Applied. To determine if the round-table estimate was properly developed and applied, ask questions such as the following:

- Is the estimator's experience appropriate for developing a round-table estimate in this situation?

The offeror may assign a single estimator or a group of estimators to develop the estimate. The estimators will define the effort required in general terms and use that definition to estimate the number of people and the time required to perform the task.

Evaluate the estimators' experience with similar work. Anyone can guess about future costs. Personnel
preparing round-table estimates should have experience with similar work and similar situations.

- Has the estimator prepared accurate round-table estimates for other contracts?

Normally, you should be more concerned about estimates prepared by a person with little estimating experience or a record of inaccurate estimates.

- Does the estimate include an adequate description of the task involved?

Round-table estimates may be summary level estimates of the time to complete an entire contract or lower level estimates of the time to complete a particular task. Require the offeror to document the definition of the task used in preparing the estimate.

- Does the estimate include an adequate description of the process and assumptions used to develop the estimate?

The estimate should include a clear description of the rationale used to develop the estimate. The rationale may be brief, but it must describe the process and assumptions used in preparing the estimate. If further clarification is needed, consider tracing some of the labor hour estimates back to the supporting work sheets and ask the estimating team to explain any discrepancies.

- If the estimate assumes a fixed level of effort over a period of time, is that assumption reasonable?

A fixed level of effort is commonly used to estimate the hours to perform repetitive tasks such as those found in project management and administration (e.g., a full-time project manager throughout the term of the contract). Evaluate the need for a fixed level of effort. For example, a large staff may be required for contract start-up but a much smaller staff may be able to do the work required during later contract performance.

- Does the estimate indicate that the required effort is more complex than it really is?

A more complex effort will require more time and higher skill levels than a less complex effort. Evaluating the task complexity is usually rather subjective. However, you might be able to develop a feel for the complexity of a task by relating it to the effort required to perform a similar task.

Do not be misled. For years, the Government and its contractors have pushed forward the state-of-the-art in many fields. Today’s knowledge is far broader than it was a few years ago. Because complexity is relative, the problems of today, relatively speaking, may be easier to solve than the less complex problems of the past.

- What does YOUR professional JUDGMENT tell you?

It is not enough to ask for the advice of technical experts. Ask questions until YOU understand. You will receive two benefits from asking questions: you will learn about the labor specialties and the language involved in performing the work required and you will become more confident in your objective if you truly understand the contract effort required.

7.2.2 Analyzing Comparison Estimates

**Comparison Estimate.** To develop a comparison labor-hour estimate, an estimator must first determine the cost to complete the same or similar work in the past. Then the estimator must develop an estimate of future contract cost based on the historical experience. Comparisons can be simple or involve the use of complex quantitative techniques. The two most common forms are:

- Direct Comparison. Comparisons may be based on a direct comparison with the hours it took to perform the same or similar effort in the past. The effort may be a specific task or a level of effort. The comparison may be used to estimate the labor cost for an entire contract or a segment of the contract. Remember even in a contract for a unique requirement, there may be tasks that are similar to the work performed in past contracts.

- Most direct comparison estimates will include an adjustment to consider differences in the acquisition situation. The rationale for these adjustments should be explained whether they are made using a quantitative or a subjective analysis.

○ Quantitative techniques (e.g., moving averages, improvement curves, or regression analysis) are frequently used to identify trends in historical data. Once a trend is identified,
you can use these same techniques to project it into the future.

- Estimators also frequently use subjective adjustment factors in comparison estimate development. These subjective factors are commonly given names such as, “plant condition factor,” “manufacturing allowance,” or “complexity factor.” For example, the estimate may state that the direct labor cost of a proposed contract is similar to the effort on a previous contract but is 20 percent more complex.

- **Cost Estimating Relationships.** A cost estimating relationship (CER) is a technique used to extend comparisons. Instead of simply basing a labor-hour estimate on the labor hours required to complete a similar task in the past, an estimator can develop CER that relates changes in cost to changes in an independent product variable or group of independent variables. Once a CER is developed, you can use it to develop more accurate estimates of labor-hour requirements. That independent variable may be another contract cost or a product characteristic:
  - A cost-to-cost relationship is based on an established relationship between two contract costs. For example, the offeror may analyze historical data from contracts that require engineering effort and find that engineering assistants work four hours for every hour worked by a senior engineer. Based on that analysis the estimator would include four engineering assistants for every hour of senior engineer labor.
  - The product-to-cost relationship relates a labor-hour estimate to a physical or performance characteristic of the product. For example, the offeror may find that the labor effort required to complete a janitorial service contract is related to number of square feet included in the contract.

Obtain and review the analysis wherein the contractor concluded that the chosen CER will result in reliable estimates and note the rationale for any adjustments to the data. Ask the estimating team to explain the rationale for using the comparison estimate as opposed to developing a detailed (bottoms-up) analysis.

**Determine If a Comparison Estimate Is Appropriate.** To determine whether use of a comparison estimate is appropriate for the estimating situation, ask questions such as the following:

- Is there a detailed analysis of work requirements that could be used for estimate development?

Comparison estimates can be quite accurate, but detailed estimating information should generally be used when available.

- Does the offeror commonly use comparison estimates in similar estimating situations?

If the offeror typically uses a detailed estimate in similar situations, question why one was not used to prepare the estimate under analysis.

- Does the cost involved warrant a more detailed estimate?

While they typically provide more insight into offeror procedures and requirement analysis, detailed estimates are time consuming and cost to develop. For a small dollar amount, a round-table or comparison estimate may be more desirable, because of the faster and less expensive analysis required. **Determine If The Comparison Estimate Was Properly Developed And Applied.** Analysis of any labor estimate based on historical labor hours should consider the acquisition situation that existed when the historical labor hours were incurred and any differences between that situation and the current acquisition situation. To determine if the comparison estimate was properly developed and applied, ask questions such as the following:

- Are the methods to be employed on the proposed contract identical to those used in the historical effort?

If methods have changed, the value of comparison estimates is open to question. You are in effect comparing apples and oranges. For example, the use of new labor saving equipment could significantly reduce the labor hours required on the contract.

- Do the historical costs represent efficient application of labor to contract completion?

If a one-time problem occurred during performance of the prior contract and no adjustment is made, you will be assuming that the same problem or a similar problem will occur on the proposed contract.
• Do historical costs include the cost of changes?

If the cost history includes the cost of changes, a cost estimate based on that history will project similar changes in the future. It may be necessary to purge the history of costs that are not anticipated to be part of the proposed work. Examples of costs that may need to be purged include: non-recurring costs, engineering changes, program redirection, rework, and production start-up.

• Has the make-or-buy plan changed?

If the offeror is now buying items that were previously made, the historical data should be adjusted to preclude estimating the labor cost to make an item that is being purchased.

• Is there any labor activity included in the historical costs that is also estimated separately?

If there is, the offeror has double estimated the cost. It must be eliminated in one estimate or the other. The time for rework and repair is an important example. Actual costs typically include the time for rework and repair. If such costs are included, do not accept any additional factors for rework and repair.

• Are the historical data complete?

The history should be accurate, complete, and current. Assure that portions of the relevant history are not missing, and that latest cost history is included.

• How reliable are the historical data?

The cognizant Government auditor can provide guidance on the acceptability of the offeror's cost accounting system. If the auditor feels that the offeror's system lacks appropriate checks and balances, is riddled with errors, or has resulted in mischarging, then the accuracy and reliability of the data are questionable.

• Does application of the should-cost principles reveal incidents of uneconomical or inefficient historical performance?

Use of cost history without critical examination could perpetuate the inefficiencies and problems of the past.

• Did the offeror correctly adjust the estimate for all significant changes in the production environment since the last contract?

Look for any significant differences in working or operating conditions that could throw off the estimate. For instance, be alert for differences in:

• Specifications (especially if specifications have been simplified since the last contract);

• Process steps;

• Equipment and tooling;

• Plant layout;

• Inspection procedures;

• Labor mix;

• Employee skill levels;

• Type of shop (e.g., model vs. production);

• Delivery schedules;

• Production rates and quantities;

• Plant capacity (full vs. idle);

• Number of shifts; or

• Overtime hours.

• If the labor-hour estimate includes a subjective adjustment factor, is the factor reasonable?

The offeror may have provided subjective estimates for such factors as task complexity. When an offeror uses a subjective adjustment factor, the offeror should document both the need for such a factor and the
rationale used to arrive at the adjustment included in the estimate.

- Have appropriate quantitative techniques been used to adjust historical data to estimate proposed contract costs?

If the offeror has had experience in making this or a like deliverable, examine historical data for evidence of trends in labor hours per unit. If there is such evidence, trend analysis or improvement curve theory could result in a more accurate projection of future labor hours.

- If the labor-hour estimate was developed using a quantitative technique (e.g., a CER, moving average, improvement curve, or regression analysis), did the estimator consider the related issues and concerns?

Whenever an estimator uses a quantitative analysis technique in estimate development, the proposal and related data should consider the issues and concerns related to the use of that technique.

7.2.3 Analyzing Estimates Developed Using Labor Standards

Labor Standard. A labor standard is a measure of the time it should take for a qualified worker to perform a particular operation. Labor standards are commonly grouped into two types:

- **Engineered Standards** are developed using recognized principles of industrial engineering and work measurement. The standards developed define the time necessary for a qualified worker, working at a pace ordinarily used, under capable supervision, and experiencing normal fatigue and delays, to do a defined amount of work of specified quality when following the prescribed method.

- **Non-engineered Standards** are developed using the best information available without performing the detailed analysis required to develop an engineered standard. Historical costs are commonly used standards that are often a measure of the hours that have been required to complete a task rather than the hours that should be required.

**Determine If Labor Standard Use Is Appropriate.** To determine whether use of a labor standard is appropriate for the estimating situation, ask questions such as the following:

- Does the offeror commonly use labor standards in similar estimating situations?

If the offeror does not use labor standards for other contracts, the proposed contract or a group of similar contracts will likely be required to cover the entire expense for standard development and maintenance. Prospective benefits may not warrant the cost involved.

- Is the offeror using non-engineered labor standards, when projected costs appear to warrant use of engineered labor standards?

As described above, historical costs are commonly used to develop non-engineered standards. As a result, non-engineered standards do not benefit from an assessment of what the cost should be. Such analysis is invaluable for identifying inefficiencies in contractor operations.

- Does the cost involved warrant use of an engineered labor standard?

While they typically provide more insight into offeror procedures and analysis of Government requirements, engineered labor standards are time consuming and costly to develop. For a small dollar amount, a comparison estimate may be more desirable, because of the faster and less expensive analysis required.

**Determine If The Labor Standard Was Properly Developed And Applied.** To determine if the labor standard was properly developed and applied, ask questions such as the following:

- Did the estimator consider the issues and concerns related to labor standard development and application?

Whenever an estimator uses a labor standard in estimate development, the proposal and related data should consider the issues and concerns related to standard development and use.

- If the estimator used a non-engineered standard based on historical data, did the estimator consider the questions related to developing and applying an estimate based on comparison estimates?

A non-engineered estimate based on historical cost is really a form of comparison estimate. If there has
been no engineering analysis of what the task completion time should be, the estimate should be
analyzed like any other comparison estimates.

- How does the company accumulate and distribute labor variances?

The difference between the actual labor cost and the standard labor cost charged to the contract is called
a variance. Variance adjustments may be handled by making cost adjustments on each job, or they can
be absorbed as an overhead adjustment. Ask the contractor to explain the source of the applied
standards and if the variances are significant, ask the contractor to explain why.

- Do all contracts use the same labor standards?

If the variance is absorbed in overhead, determine that the same labor standards are used by all
contracts, particularly commercial and government. In addition, verify that the labor skill mix requirements
are roughly the same between commercial and government contracts. If commercial requirements differ,
assess the risk that labor standards have been set artificially low for the labor mix associated with
commercial contracting. Low standards create higher variance costs, which are then allocated through
the overhead adjustment to all contracts.

**7.3 Analyzing Labor-Rate Estimates**

This section identifies points to consider as you analyze direct labor labor-rate estimates.

- 7.3.1 - Considering Government Labor-Rate Requirements
- 7.3.2 - Considering The Skill Mix Of Labor Effort
- 7.3.3 - Considering The Time Period Of Labor Effort
- 7.3.4 - Considering Company-Unique Factors

Consider Preliminary Review Results. As you analyze offeror-proposed labor rates, give special attention
to any direct labor rate concerns identified during your preliminary review of direct labor cost estimates.

**Obtain Available Audit and ACO Analysis Support (FAR 15.404-2(c) and 15.407-3).** As you evaluate
offeror labor rates, remember that employee compensation includes more than just wages. Many
elements of compensation (e.g., pensions, savings plan benefits, incentive bonuses, and health
insurance) typically appear in indirect cost accounts. As a result, compensation analysis is a complex task
that requires in-depth understanding of the firm's compensation package and accounting procedures.
In most cases, the Government auditor and the administrative contracting officer (ACO) are the two
Government Acquisition Team members who have the most in-depth knowledge of a firm's compensation
package and accounting procedures. The auditor is the only Government Acquisition Team member with
general access to the offeror's accounting records. The ACO is responsible for negotiating Forward
Pricing Rate Agreements (FPRAs), including labor-rate agreements.

**Honor ACO Recommendations and Agreements (FAR 15.407-3(b) and DFARS 215.407-3(b)).** If the ACO
has issued a written forward pricing rate recommendation (FPPR), do not deviate from the ACO-
recommended rates without first contacting the ACO. The ACO should be able to provide detailed support
for the current recommendation. After that contact, if you feel that the recommended rate is not
reasonable and you can document why an alternative rate is more reasonable, you may use the
alternative rate as a basis in developing your position on contract price.

If the offeror and the ACO have negotiated a forward pricing rate agreement (FPRA), the offeror is
obligated to use FPRA rates in proposal preparation and Government contracting officers are obligated to
use them as a basis for contract pricing. If you have information indicating that the FPRA rates are not
reasonable, inform the ACO and request the ACO to negotiate an adjustment or terminate the FPRA.
However, unless the FPRA is terminated or you are authorized under agency procedures to develop your
own rate position, use the current FPRA as a basis for contract pricing.

**Bases for Determining Labor Rate Reasonableness (FAR 31.205-6(b)).** Center your labor-rate analysis
on the five questions below. If you can answer yes to one or more of these five questions, you should
normally determine that the proposed labor rate is reasonable:

- Is the proposed labor rate and related compensation reasonable based on comparisons with the
  compensation practices of other firms of the same size?
• Is the proposed labor rate and related compensation reasonable based on comparisons with the compensation practices of other firms in the same industry?
• Is the proposed labor rate and related compensation reasonable based on comparisons with the compensation practices of other firms in the same geographic area?
• Is the proposed labor rate and related compensation reasonable based on comparisons with the compensation practices of firms engaged in predominantly non-Government work?
• Is the proposed labor cost reasonable based on comparisons with the cost of comparable services from other sources?

Factors to Consider in Labor Rate Comparisons. The questions above are straightforward, but the related comparisons may not always be easy. As you make labor-rate comparisons, consider the effect of the following factors on those comparisons:
• Government labor-rate requirements;
• Skill mix of labor effort;
• Time period of labor effort; and
• Company-unique labor factors.

Develop and Document Your Pre-negotiation Position. As you develop and document your pre-negotiation position on labor rates:
• If you accept the offeror’s labor-rate estimate, document that acceptance.
• If you do not accept the labor-rate estimate, document your concerns with the estimate and develop your own pre-negotiation position for costs covered by the estimate.
• If you can identify information that would permit you to perform a more accurate labor-rate analysis, use the available information. Your analysis is not bound by the estimating methods used by the offeror.

7.3.1 Considering Government Labor-Rate Requirements
Contracts and Labor Rate Requirements. The Government is concerned that firms may attempt to compete by lowering employee compensation. As a result, there are laws and Government labor policies that limit a firm’s ability to lower compensation. The laws with the most obvious affect on labor rates pricing include the:
• Service Contract Act of 1965, as amended;
• Davis-Bacon Act;
• Walsh-Healey Public Contracts Act;

The Office of Federal Procurement Policy Letter No. 78-2, provides additional guidance for professional employee labor rates for large service contracts.

Service Contract Act Requirements (FAR 22.1001, 22.1002, and 22.1003). As you analyze labor rate reasonableness, consider the following questions related to Service Contract Act of 1965, as amended:
• Does the Service Contract Act apply to this type of labor?
  o The Service Contract Act applies to service employees under Government service contracts in excess of $2,500.
    ▪ A service employee is any person engaged in the performance of a service contract except those employed in a bona fide executive, administrative, or professional capacity.
    ▪ To be a service contract, the principle purpose of the contract must be to provide services. For example, the Act does not apply to contracts for equipment that require incidental services to install the equipment.
By statute, the Act does not apply to any:

- Contract performed outside the United States;
- Contract for construction, alteration, or repair of public buildings or public works, including painting and decorating;
- Work required to be performed in accordance with the provisions of the Walsh-Healey Public Contracts Act;
- Contract for transporting freight or personnel by vessel, aircraft, bus, truck, express, railroad, or oil or gas pipeline where published tariff rates are in effect;
- Contract for furnishing services by radio, telephone, or cable companies subject to the Communications Act of 1934;
- Contract for public utility services;
- Employment contract providing for direct services to a Federal agency by an individual or individuals; or
- Contract for operating postal contract stations for the U.S. Postal Service.

In addition, the Secretary of Labor has exempted several types of contracts from all provisions of the Act. These include:

- Most Government contracts with common carriers;
- Certain contracts between U.S. Postal Service and individual owner-operators for mail service;
- Contracts for the carriage of freight or personnel if such carriage is subject to rates covered by Section 10721 of the Interstate Commerce Act; and
- Contracts principally for the maintenance, calibration, or repair of certain types of equipment.

- Do the proposed labor rate and related fringe benefits meet the minimum requirements established by any Department of Labor wage determination (for that class of employee) attached to the solicitation/contract?

A contractor must pay the wages and fringe benefits required by the wage determination for that class of labor. Those requirements are based on Department of Labor’s evaluation of the prevailing wage rates and fringe benefits in the locality.

- If a wage rate determination is attached to the solicitation/contract, the offeror must classify any class of service employee which is not listed in the determination but is employed under the contract in a manner that provides a reasonable relationship between the unlisted classifications and the classifications listed in the wage determination. For example, a more skilled person in a similar class of work could not make less money than an employee covered by the wage determination.

- However, you cannot require an offeror to comply with a wage determination when none is provided to the offeror. If there is no wage determination, the offeror must propose to pay at least the minimum wage established by the Fair Labor Standards Act (FAR 52.222-43).

- If the labor rate exceeds the appropriate Department of Labor wage determination, is the difference reasonable?

The wage determination only sets the minimum wage that can be paid for a particular class of labor. The offeror may pay more than the minimum. However, remember that these wage determinations are based on the prevailing wage in the locality or the collective bargaining agreement negotiated by the contractor under any predecessor contract.

- Do proposed rate increases conflict with the Fair Labor Standards Act and Service Contract Act -- Price Adjustment (Multiple Year and Option Contracts) clause?
If the contract is a multi-year contract or includes an option to extend the contract, remember that the Fair Labor Standards Act and Service Contract Act -- Price Adjustment (Multiple Year and Option Contracts) clause provides for price increases based on changes in the wage determination or minimum wage. Affected labor rates are based on the wage determination or minimum wage that is current on the contract anniversary or the beginning of each renewal option period.

- The offeror cannot project a labor rate increase and also benefit from an additional adjustment due to a change in a related wage determination or the minimum wage. By submitting an offer under a solicitation that includes the above clause, the offeror certifies that the offer does not include any allowance for any contingency covered by the clause.

- The offeror can project labor rate increases that are not the covered by the clause. For example, if the offeror's labor rate is $7.25 and the wage determination is $7.00, the labor rate would not be affected by an increase in the wage determination from $7.00 to $7.05. If the offeror projects an increase in the $7.25 labor rate to $7.30 after one year, that must be separately estimated. Still, remember that wage determinations are based on the prevailing wage in the locality, the collective bargaining agreement negotiated by the contractor under any predecessor contract (FAR 22.1008-3), or the minimum wage set forth in the Fair Labor Standards Act.

- Do the proposed labor rate and related fringe benefits meet the minimum requirements established by an applicable collective bargaining agreement negotiated by a predecessor contractor?

- The Act provides that a successor contractor must pay wages and fringe benefits (including accrued wages and benefits and prospective increases) to service employees at least equal to those agreed upon by a predecessor contractor under the following conditions:
  - The services to be furnished under the proposed contract will be substantially the same as services being furnished by an incumbent contractor whose contract the proposed contract will succeed.
  - The services will be performed in the same locality.
  - The incumbent prime contractor or subcontractor is furnishing such services through the use of service employees whose wages and fringe benefits are the subject of one or more collective bargaining agreements.

The requirement above does not apply if:

- The incumbent contractor enters into a collective bargaining agreement for the first time and the agreement does not become effective until after the expiration of the incumbent's contract.

- The incumbent contractor enters into a new or revised collective bargaining agreement during the incumbent's period of performance on the current contract, the terms of the new or revised agreement shall not be effective for the purposes of the Act when:

  - Either of the following is true:
    - In sealed bidding, the contracting agency receives notice of the terms of the collective bargaining agreement less than 10 days before bid opening and finds that there is not reasonable time still available to notify bidders; or
    - For contractual actions other than sealed bidding, the contracting agency receives notice of the terms of the collective bargaining agreement after award, provided that the start of performance is within 30 days of award; and
    - The contracting officer has given both the incumbent contractor and its employees' collective bargaining agent timely written notification of the applicable acquisition dates.

- The Secretary of Labor determines:
  - After a hearing, that the wages and fringe benefits in the predecessor contractor's collective bargaining agreement are substantially at variance with those which prevail for services of a similar character in the locality, or
That the wages and fringe benefits in the predecessor contractor's collective bargaining agreement are not the result of arm's length negotiations.

**Davis-Bacon Act Requirements** (FAR 22.401 and 22.403). As you analyze labor rate reasonableness, consider the following questions related to the Davis-Bacon Act:

- Does the Davis-Bacon Act apply to this type of labor?

The Davis-Bacon Act applies to laborers or mechanics at the site of work for any Government or District of Columbia contract in excess of $2,000 for construction, alteration, or repair (including painting and decorating) of public buildings or public works within the United States.

- The term "laborers or mechanics," includes:
  - Those workers, utilized by a contractor or subcontractor at any tier, whose duties are manual or physical in nature (including those workers who use tools or who are performing the work of a trade), as distinguished from mental or managerial;
  - Apprentices, trainees, helpers, and, in the case of contracts subject to the Contract Work Hours and Safety Standards Act, watchmen and guards.
  - Working foremen who devote more than 20 percent of their time during a workweek performing duties of a laborer or mechanic, but do not meet the requirements for bona fide executive, administrative, or professional status; and
  - Every person performing laborer or mechanic duties, regardless of any contractual relationship alleged to exist between the contractor and those individuals.

- The term "laborers or mechanics," does not include workers whose duties are primarily executive, supervisory (except the working foreman described above), administrative, or clerical, rather than manual. Persons employed in a bona fide executive, administrative, or professional capacity are not laborers or mechanics.

- The "site of the work" is the physical place or places where the construction called for in the contract will remain when work is completed, and nearby property.

- Except as provided in the next paragraph, the term includes fabrication plants, mobile factories, batch plants, borrow pits, job headquarters, and tool yards, provided these locations are dedicated exclusively, or nearly so, to performance of the contract or project, and are so located in proximity to the actual construction location that it is reasonable to include them.

- The term does not include permanent home offices, branch plant establishments, fabrication plants, or tool yards of a contractor or subcontractor whose locations and continuance in operation are determined wholly without regard to a particular Government contract or project. In addition, fabrication plants, batch plants, borrow pits, job headquarters, yards, etc., of a commercial supplier or materialman which are established by a supplier of materials for the project before opening of bids and not on the project site, are not include.

- Do the proposed labor rate and related fringe benefits meet the minimum requirements established by any applicable Department of Labor wage determination (for the applicable rate schedule) attached to the solicitation/contract (FAR 22.404)?

A contractor must pay the wages and fringe benefits required by the wage determinations incorporated in the solicitation/contract. The Department of Labor is responsible for issuing wage determinations reflecting prevailing wages, including fringe benefits. Those wage determinations apply only to those laborers and mechanics employed by a contractor upon the site of the work including drivers who transport to or from the site materials and equipment used in the course of contract operations. Determinations are issued for different types of construction, such as building, heavy, highway, and residential (referred to as rate schedules), and apply only to the types of construction designated in the determination.

- A general wage determination is used in contracts performed within a specified geographical area. It contains prevailing wage rates for the types of construction designated in the
determination. There is no expiration date determinations remain valid until modified, superseded, or canceled by a notice in the Federal Register by the Department of Labor. Once incorporated in a contract, a general wage determination normally remains effective for the life of the contract.

- A project wage determination is issued at the specific request of a contracting agency. It is used only when no general wage determination applies, and is effective for 180 calendar days from the date of the determination. However, if a determination expires before contract award, it may be possible to obtain an extension to the 180-day life of the determination. Once incorporated in a contract, a project wage determination normally remains effective for the life of the contract.

- You cannot require an offeror to comply with a wage determination when none is provided to the offeror. However, you may issue a solicitation before obtaining the appropriate rate schedule.

- In sealed bidding, you must not open bids until a reasonable time after you have furnished the wage determination to all bidders.

- In negotiated acquisitions, you may open proposals and conduct negotiations before obtaining the wage determination, but you must incorporate the wage determination before submission of final proposal revisions.

- If the labor rate exceeds the appropriate Department of Labor wage determination, is the difference reasonable?

The wage determination only sets the minimum wage that can be paid for a particular class of labor. The offeror may pay more than the minimum. However, remember that these wage determinations are based on the prevailing wage in the locality.

Walsh-Healey Public Contract Act (FAR 22.602, 22.603, and 22.604). As you analyze labor rate reasonableness, consider the following questions related to the Walsh-Healey Public Contract Act:

- Does the Walsh-Healey Public Contract Act apply to this type of labor?

The Walsh-Healey Public Contract Act applies to contracts (including, indefinite-delivery contracts, basic ordering agreements, and blanket purchase agreements) and subcontracts under Section 8(a) of the Small Business Act, for the manufacture or furnishing of supplies that are to be performed within the United States, Puerto Rico, or the Virgin Islands, and which exceed or may exceed $10,000, unless exempted.

- Statutory exemptions include contracts for any of the following:

  - Any item acquired in a situation where you are authorized by the express language of a statute to purchase "in the open market" generally (e.g., commercial items); or where a specific purchase is made under a public exigency.

  - Perishables, including dairy, livestock, and nursery products.

  - Agricultural or farm products processed for first sale by the original producers.

  - Agricultural commodities or the products thereof purchased under contract by the Secretary of Agriculture.

- Regulatory exemptions include the following:

- Contracts for the following requirements are fully exempt from the Act:

  - Public utility services;

  - Supplies manufactured outside the United States, Puerto Rico, or the Virgin Islands;

  - Purchases against the account of a defaulting contractor where the stipulations of the Act were not included in the defaulted contract; and

  - Newspapers, magazines, or periodicals, contracted for with sales agents or publisher representatives, which are to be delivered by the publishers thereof.

  - The following are partially exempt from the Act:
o Contracts with certain coal dealers;
o Certain commodity exchange contracts;
o Contracts with certain export merchants;
o Contracts with small business defense production pools, and small business research and development pools;
o Contracts with public utilities for the acquisition of certain uranium products.

- Upon the request of the agency head, the Secretary of Labor may exempt specific contracts or classes of contracts from the inclusion or application of one or more of the Act's stipulations; provided, that the request includes a finding by the agency head stating the reasons why the conduct of Government business will be seriously impaired unless the exemption is granted.
- Does the proposed labor rate meet the minimum requirements the Act?

The offeror/contractor must pay the minimum wage rates specified by the Act. As you analyze labor rate reasonableness, consider the following questions related to the Office of Federal Procurement Policy (OFPP) issued Policy Letter No. 78-2, Preventing "Wage Busting" for Professionals, dated March 29, 1978:
- Does OFPP Policy Letter No. 78-2 apply to this type of labor?
- The Service Contract Act of 1965 was enacted to ensure that Government contractors compensate their blue-collar service workers and some white-collar service workers fairly, but it does not cover bona fide executive, administrative, or professional employees. The Office of Federal Procurement Policy issued Policy Letter No. 78-2 to provide policies and procedures for use in negotiated service contracts exceeding $500,000 that involve meaningful numbers of professional employees.
- The term "professional employee" includes members of those professions having a recognized status based upon acquiring professional knowledge through prolonged study. Examples of these professions include accountancy, actuarial computation, architecture, dentistry, engineering, law, medicine, nursing, pharmacy, the sciences (such as biology, chemistry, and physics, and teaching) (FAR 22.11).
- To be a professional employee, a person must not only be a professional but must be involved essentially in discharging professional duties.
- Does the proposed labor rate meet the minimum requirements of OFPP Policy Letter No. 78-2?
- The offeror must propose labor rates and related compensation that compensates professional employees fairly and properly.
- Use the Evaluation of Compensation for Professional Employees provision in requests for proposals to require offerors to submit a total compensation plan for evaluation. The plan should set forth proposed salaries and fringe benefits for professional employees working on the contract.
- Supporting information will include data (e.g., recognized national and regional compensation surveys and studies of professional, public and private organizations) used in establishing the total compensation structure.
- Evaluate the plan to assure that it reflects a sound management approach and understanding of contract requirements. Assess the offeror's ability to provide uninterrupted high-quality work. Evaluate the proposed professional compensation in terms of its impact upon recruiting and retention, its realism, and its consistency with a total plan for compensation. Proposed compensation levels should:
- Reflect a clear understanding of the work required under the contract.
- Indicate the capability of the proposed compensation structure to obtain and keep suitably qualified people to meet mission objectives.
• Take into account differences in skills, the complexity of various disciplines, and professional job difficulty.
• Evaluate proposals envisioning compensation levels lower than those of predecessor contractor for the same work considering the effect on program continuity, uninterrupted high-quality work, and availability of required competent professional service employees.

7.3.2 Considering The Skill Mix Of Labor Effort

*Skill Mix.* The labor rate for a top scientist is usually more than the labor rate for a technician. You would not accept a cost estimate that proposes only top scientists for routine equipment repair. At the same time, you would not accept a cost estimate that proposes only technicians for a complex research effort to advance the state of the art in nuclear physics.

Part of your task in evaluating proposed labor rates is to evaluate the labor mix. You will likely need technical support to develop a pricing position that represents an effective and efficient mix of skills for contract performance.

- Is the proposed skill mix reasonable for the work required?

Most contracts require a mix of skills. For example, top scientists would obviously play a key role in a contract to advance the state of the art in nuclear physics, but technicians would likely be more efficient and more effective at performing many tasks. Top scientists would cost more per hour and likely require more hours. Technicians may be able to do many of the tasks traditionally assigned to top scientists, but require much longer to complete them.

- Is the proposed skill mix reasonable based on the mix used in performing similar contracts?

Comparisons are particularly important for follow-on contracts for similar products or services. Normally, higher level skills should not be employed on a follow-on contract unless there were identified labor problems or more complex work is required. Lower level skills may be appropriate as complex problems are solved and contract effort becomes more routine.

**Calculating a Weighted-Average Labor Rate.** When pricing proposals, offerors usually find it impractical, if not impossible, to identify the exact labor rate for each individual projected to work on the contract. They likely do not know exactly who will work on which contract and how many hours they will work.

- Did the offeror use a weighted-average labor rate?

The offeror may estimate labor rates by position class (e.g., senior engineer or principle analyst) or by department. Eitherway, they will likely use some form of weighted-average labor rate. A weighted average rate takes into account the rate and the number of workers working at that rate.

- Did the offeror calculate the weighted-average labor rate correctly?

The following table demonstrates the weighted-average labor rate calculation for Engineering Department A. The department work force includes three engineering position classes: senior engineer, intermediate engineer, and entry-level engineer.

| Calculating a Weighted-Average Labor Rate for Engineering Department A |
|-----------------------------|---------------------------|----------------|--------------------------|
| Engineering Labor Category | Engineers Employed | Labor-rate per Hour | Weighted Data Column |
| Senior                     | 100                      | $37.50            | $3,750.00               |
| Intermediate               | 200                      | $31.02            | $6,204.00               |
| Entry-Level                | 300                      | $29.90            | $8,970.00               |
| Totals                     | Engineers Employed      | Weighted Data     |                          |
| Total From Dept. A         | 600                      | $18,924.00        |                          |
### Table

<table>
<thead>
<tr>
<th>Total From Dept. B</th>
<th>725</th>
<th>$26,462.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Total</td>
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</table>

Combined weighted-average labor rate = $45,386.50 ÷ 1,325 = $34.25

- The offeror plans to divide this new department into two teams -- Competitive Production Contracts Team and Non-competitive Production Contracts. Everyone will be doing the same work as before the two departments were combined.
- By combining these two departments with dissimilar work forces, the offeror can shift cost from the competitive production work to the non-competitive work.
- Under the combined structure the workers on the non-competitive contracts in the old Department A would have a rate of $34.25 an hour instead of $31.54, even though the workers are the same.
- Under the combined structure the workers on the competitive contracts in the old Department B would have a rate of $34.25 an hour instead of $36.50, even though the workers are the same.

**Contract vs. Plant-Wide Averages.** Many contracting officers question the use of plant-wide labor rates for contract pricing. They feel that the contract direct labor rate should reflect only the work required under the contract.

- Does the Government consistently accept the plant-wide labor rate for other contracts?

Normally, you should use a plant-wide labor rate if the Government accepts the plant-wide rate for all other proposals. In other words, both you and the offeror must be consistent! Neither party should "cherry pick" rates by using the specific contract rate or the plant-wide average, depending on the relative pricing advantage involved. The offeror's estimating procedures should clearly spell out how labor rates will be applied.

- Is a plant-wide labor rate reasonable for the proposed contract?

If the offeror estimates using plant-wide average rates but the work performed on your contract is substantially different than the other work performed by the offeror, the skill mix required on your contract may be substantially different. If the proposed contract effort is different than other work performed by the offeror, you may need to encourage the offeror to change the method used in labor-rate estimating. Contact the cognizant ACO or the cognizant Government contract auditor for assistance.

### 7.3.3 Considering The Time Period Of Labor Effort

**Need to Evaluate Estimates of Time of Performance.** Unless the proposed contract is going to be completed within a few weeks of contract award, the time period or periods when work will be performed becomes very important. Labor rates are not constant. To develop a realistic estimate of direct labor costs, the estimate must match the labor-hour estimate with a reasonable labor rate for the period when the work will take place. Remember, the objective of your analysis is to develop a pricing position that, as closely as possible, estimates what actual labor costs will be.

**Labor-Loading Schedules (FAR Table 15-2).** The offeror's proposal should include labor-loading schedule -- a time-phased (e.g., monthly or quarterly) breakdown of labor hours, rates, and costs by labor category.

- Does the labor-loading schedule provide a reasonable match of the labor hours required to complete the contract with the time period when the labor effort is projected to occur?

The proposal should include supporting rationale for the assignment of labor hours to future time periods and the pattern of labor-hour estimates in the schedule should match the pattern of work expected for contract performance. For a contract that will extend over many months, you should not expect that all work will be completed in the first month or the last. You should expect labor effort throughout the period, and the pattern should be reasonable (e.g., product design should be scheduled before product assembly).

**For example:** The two tables below present two different contract labor estimates from a company that revises labor-rate estimates annually. Work begins in August 19X1 and will continue at a relatively
constant level of effort through April 19X2. Note that Labor Estimate 1 appears more reasonable, because the labor-hours are more logically identified with the period when they are projected to occur.

<table>
<thead>
<tr>
<th>Labor Estimate 1</th>
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<tbody>
<tr>
<td>Rate Period</td>
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<tr>
<td>19X1</td>
</tr>
<tr>
<td>19X2</td>
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<tr>
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<table>
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<tr>
<th>Labor Estimate 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Period</td>
</tr>
<tr>
<td>19X2</td>
</tr>
</tbody>
</table>

- Does the labor-rate proposal conform to the offeror's accounting and estimating practices?
- The offeror may estimate rates for each month, quarter, year, or some other period. Whatever estimating periods the offeror uses to estimate labor rates, the estimate should use the same periods.

Using Industry and Company Data to Estimate Future Rates. The offeror’s labor rates must be reasonable for the work required and the time period when the work will be performed.
- Are future rate estimates reasonable considering the current rate and projected industry rate increases?

There are two U.S. Bureau of Labor Statistics indexes that you may find useful as you analyze projected labor rate changes.
- The Employment Cost Index provides information on compensation changes over time with data presented by occupation, occupation within industry, regions, bargaining unit status, and metropolitan area status.
- The Consumer Price Index provides information on changes in consumer prices over time. While this index does not relate directly to labor rates, changes for many labor rates are tied to changes in the index.

The indexes above are historical indexes. You can use the data to estimate trends, but the indexes do not provide forecasts. However, there are commercial forecasting services (e.g., DRI/ McGraw-Hill) that provide such forecasts.
- Are future rate estimates reasonable considering the current rate and historical rate increases provided by the firm?

Company labor-rate increases usually follow a trend over time. If you have three years of labor-rate data and you note that wages are increasing at a rate of five percent per year, you can use that information coupled with other data to estimate future rates.
However, remember that historical data reflect what happened in the past. You can use a quantitative technique (e.g., regression analysis) to project the trend, but such analysis will not be able to predict changes in the economy and other factors that will affect labor rates.

Labor-Management Agreement (FAR 22.101-2 and 31.205-6(c)). Rates must be reasonable considering any existing labor-management agreement. However, you should question any rates that appear unwarranted or discriminatory.
- Do the proposed labor rates conform to any labor-management agreement on wages or salaries?

Proposed labor rates should normally conform to any labor-management agreement on wages or salaries. However, contractor labor policies and compensation practices, whether or not included in labor-management agreements, are not acceptable bases for analyzing proposed labor rates if those policies and practices result in unreasonable costs to the Government.
If there is a labor-management agreement on wages or salaries, should you use it as a basis for estimating future labor rates?

You should consider costs of compensation established under "arm's length" negotiated labor-management agreements reasonable, if you do not determine that they are unwarranted by the character and circumstances of the work or discriminatory against the Government.

- A labor rate is unwarranted when the offeror applies the agreement provisions that were designed to apply to a given set of circumstances and conditions of employment (e.g., work involving extremely hazardous activities) to a Government contract involving significantly different circumstances and conditions of employment (e.g., work involving less hazardous activities).

- A labor rate is discriminatory against the Government if it results in employee compensation (in whatever form or name) in excess of that being paid for similar non-Government work under comparable circumstances.

7.3.4 Considering Company-Unique Factors

Differences Between Companies. There can be vast differences in the compensation policies and procedures of different firms -- even when the firms are in the same industry and region. You must consider these differences as you perform your direct labor-rate analysis.

- Is each proposed labor rate representative of the employees who will perform the work?

Typically, contractors estimate direct labor rates for each major category of labor. Most contractors calculate each estimated rate by finding the simple average of the actual pay rate of the participating employees. However, some contractors calculate a weighted average labor rate based on the expected direct hours each participating employee is likely to charge direct. Generally, the latter method is more accurate, but it requires more effort to compute. Still, other contractors may estimate based on the pay rate of the specific individual who will be performing the work. This may be appropriate when a contract calls for the "know-how" of specific individuals. Each of these methods may result in reasonable labor estimates provided a consistent practice is followed and deviations will not affect the proper recovery of anticipated costs.

- Are the estimated rates based on the actual pay rates of incumbent employees?

If a majority of the employees expected to perform work on the contract are on the current payroll, the direct labor estimate should be based on the known current pay rates. Ask the contractor to explain any adjustments made to current paid labor to arrive at the estimates.


The term "uncompensated overtime" relates to any unpaid hours worked in excess of an average 40 hours per week by an employee who is exempt from requirements of the Fair Labor Standards Act (FLSA). Over the past few years, uncompensated has become a substantial concern in labor-rate analysis, particularly in service contracting. Increasingly, firms are encouraging or even requiring FLSA-exempt employees to work a 45 to 80 hour week - while paying them a salary based on 40 hours.

- How does the offeror's method of accounting for uncompensated overtime affect labor rates and product quality?
Differences in accounting for uncompensated overtime can affect proposal evaluation. It can be a particular problem for technical or professional services contracts where the requirement is defined by the number of hours to be provided rather than by the task to be performed. For example, Firm A may be able to offer a lower rate per hour than Firm B, because Firm A requires its employees to accept uncompensated overtime and Firm B does not.

- Insert the FAR Identification of Uncompensated overtime provision in any solicitation valued above the simplified acquisition threshold for professional or technical services to be acquired on the basis of the number of hours to be provided.
- When evaluating the realism of the proposed price for a professional or technical service contract where the requirement is defined on the basis of the number of hours to be provided, consider the probable effects of compensated overtime on contract performance. For example, one employee working 80 hours per week may not be able to contribute as much to contract performance as two employees who are both working 40 hours per week.

Paid Overtime and Shift Premiums (FAR 22.103).
- Does the proposal include paid overtime or shift premiums?
- Whenever possible, ascertain the extent that offers are based on payment of overtime or shift premiums.
- Is the paid overtime or shift premium reasonable?

Do not negotiate prices that include overtime or shift premiums unless they are necessary for timely contract completion.
- Simply stated, the Government requirement must necessitate the need for premium charges.
- If the offeror is proposing overtime to compensate for poor scheduling, Government recognition of the overtime costs is clearly not reasonable.
- Approval of overtime use may be granted by an agency approving official after determining in writing that overtime is necessary to:
  - Meet essential delivery or performance schedules;
  - Make up for delays beyond the control and without the fault or negligence of the contractor; or
  - Eliminate foreseeable extended production bottlenecks that cannot be eliminated in any other way.

Changes in Labor Demographics. Changing demographics can have a substantial affect on labor rates.
- Are labor rates affected by demographic changes related to business volume?

Business volume changes can have a substantial affect on labor demographics, including: major personnel hiring, layoffs, recalls, and early retirement options.
- Layoffs are typically accomplished considering seniority. New lower-paid employees are usually the first to go with the more senior higher paid employees staying on. The result is an increase in average labor rates.
- Recalls and new hiring typically introduce additional employees at relatively lower pay levels. The result is a decrease in average labor rates.
- Early retirements typically allow higher paid senior employees to leave the company. Labor rates drop, but retirement expenses (indirect costs) may increase.

- Are labor rates affected by demographic changes related to production methods?

Production method changes can have a disruptive effect on labor rates by shifting the number of employees in different skill levels and by eliminating or adding whole job categories. For example a shift from manual production to automated production may cause the firm to replace skilled craftsmen with lower-skilled machine operators.

Compensation Trade-Offs (FAR 31.205-6(b)). In most firms, wage rates are only part of a complex
compensation package. Differences in these packages can significantly affect comparisons between firms.

- Do differences in other elements of compensation affect labor-rate comparisons?

Your comparison of the labor rate of one firm with the rates of other firms may be affected by related compensation package differences (e.g., lower labor rates but higher pension benefits). Only consider offsets between the allowable elements of an employee's (or a job class of employees') compensation package or between the compensation packages of employees in jobs within the same job grade or level.

- Do trade-offs between labor rates and other compensation elements appear to result in a compensation package that is reasonable overall?

Consider measurable trade-offs between any of the following compensation elements:

- Wages and salaries;
- Incentive bonuses;
- Deferred compensation;
- Pension and savings plan benefits;
- Health insurance benefits;
- Life insurance benefits; and
- Compensated personal absence benefits.

8.0 Chapter Introduction

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8.0 Chapter Introduction

This chapter identifies points to consider as you develop your prenegotiation position on other direct costs.

Analysis Responsibility (FAR 15.402(a) and 15.404-2(a)). The contracting officer has the ultimate responsibility for determining price reasonableness, but the contracting officer should request any necessary support from other members of the Government Acquisition Team. Any request for support should be tailored to the proposal under analysis. Requesting unnecessary assistance can waste important Government resources.

Flowchart of Other Direct Cost Analysis. The following flowchart depicts the key events completed as part of a typical other direct cost analysis:
8.1 Identifying Other Direct Costs For Analysis

Identifying Other Direct Costs (FAR Table 15-2). FAR describes other direct costs as costs not previously identified as a direct material cost, direct labor cost, or indirect cost. In other words, an other direct cost is a cost that can be identified specifically with a final cost objective that the offeror does not treat as a direct material cost or a direct labor cost. Examples of the types of cost that are commonly proposed as other direct costs include:

- Special tooling and test equipment;
- Computer services;
- Consultant services;
- Travel;
- Federal excise taxes;
- Royalties;
- Preservation, packaging, and packing costs; and
- Preproduction costs.
*Reasons for Other Direct Cost Identification and Treatment.* Costs are identified and treated as other direct costs to assure proper allocation and treatment.

- **Cost allocation.** An other direct cost is often the type of cost that the firm would normally charge as an indirect cost, but the proposed contract requires a large, unusual, or one-time expenditure (e.g., special tooling) that will benefit only the proposed contract. It would be unreasonable to expect the rest of the firm's products to share these unique costs.

- **Cost treatment.** Costs may be treated as other direct costs to assure that they will receive proper treatment. For example, special tooling bought to complete a specific Government contract will normally become Government property. That property may then be furnished to that firm or other firms for similar contracts.

*Points to Consider.* As you plan for other direct cost analysis, look for indicators of uneconomical or inefficient practices. Consider the results of any technical or audit analyses. If an element of proposed other direct cost appears suspicious, concentrate more analysis effort on that element than on a less suspicious cost element of similar dollar value. As you plan:

- Identify any proposed other direct cost that apparently should be classified as an indirect cost.
- Identify any proposed other direct cost that appears to duplicate another proposed direct cost.
- Identify any proposed other direct cost that does not appear reasonable.
- Identify any proposed other direct cost that merits special attention because of high value or other reasons.
- Assure that concerns about other direct cost estimates are well documented.

**Identify Any Proposed Other Direct Cost That Apparently Should Be Classified As an Indirect Cost.** Because many other direct costs might be classified as indirect costs under different circumstances, it is particularly important to assure that the proposed treatment is proper. To identify any proposed other direct cost that apparently should be classified as an indirect cost, ask questions such as the following:

- Will the proposed cost benefit both the proposed contract and other work?
  
  If the cost will benefit the proposed contract and other contracts, it should not be treated as an other direct cost. Instead it should be treated as an indirect cost.

  - Does the offeror customarily treat similar costs as indirect costs under similar circumstances?

  If the offeror customarily treats similar costs as indirect costs under similar circumstances, the proposed cost should also be treated as an indirect cost. If the contractor is covered by the Cost Accounting Standards, the cognizant ACO and auditor maintain a copy of the current disclosure statement. This document should describe how similar costs are to be treated.

- Can the accounting system segregate proposed other direct costs from similar indirect costs?

  If the accounting system cannot differentiate between the proposed cost and similar indirect costs, the proposed cost should also be treated as an indirect cost. Generally, the cognizant auditor will have conducted either a pre-award or post-award accounting system survey which addresses the contractor’s ability to segregate various types of costs and should be consulted for assistance with significant costs.

**Identify Any Other Direct Cost That Appears To Duplicate Another Direct Cost.** To identify any proposed other direct cost that appears to duplicate another proposed direct cost, ask questions such as the following:

- Does the proposed other direct cost effort duplicate tasks already proposed as part of direct material cost or direct labor cost?

  An estimator preparing an estimate of direct labor cost or direct material cost may not know that the same task is being estimated as part of other direct cost. It can be particularly easy for a firm to propose in-house labor and consultant labor to complete the same task.

  - Does a cost estimating relationship used to estimate direct material cost or direct labor cost include costs to perform tasks also proposed as an other direct cost?

  Costs may normally be proposed using a cost estimating relationship. For example, computer support may be estimated based on the number of engineering hours. However, the unique nature of the
proposed contract may require vastly more and different types of engineering computer support. Accordingly, the firm has proposed to purchase outside computer services as an other direct cost. Since the other direct cost will replace the in-house support, the in-house support should not be included in the cost estimate.

**Identify any Cost That Does Not Appear Reasonable.** To identify any proposed other direct cost that does not appear reasonable, ask questions such as the following:

- Is the proposed other direct cost consistent with the offeror's estimating assumptions?

If any part of the estimate is not consistent with stated estimating assumptions, inquire further to determine if an error was made. For example, if the estimating assumption is that a group of two to four travelers will share a rental car on each trip, proposed travel cost should be calculated consistent with this assumption.

- Is the proposed other direct cost necessary to complete the contract?

Require the offeror to support the need for any other direct cost that does not appear needed to complete contract tasks.

- Has the offeror identified all the other direct costs reasonably required to complete the contract?

If the offeror appears to need additional other direct cost support to complete the contract, question why the cost for that support was not included in the cost proposal.

**Identify Costs Which Merit Special Attention.** To identify any proposed other direct cost that merits special attention because of high proposed cost or other reasons, ask questions such as the following:

- Is any single other direct cost a large portion of the total cost estimate?

Occasionally, a single estimate will be a large part of the entire estimate. That estimate will normally merit special attention because of the dollars involved.

- Is any other direct cost critical to contract performance?

The offeror's ability to obtain the resources treated as other direct costs may be critical to contract performance. Critical elements merit special consideration to assure that the offeror fully understands contract requirements.

**Document Concerns About Other Direct Cost Estimates.** To assure that concerns about other direct cost estimates are well documented, ask questions such as the following:

- Have you identified concerns about other direct cost estimates?

If the answer is "yes" document the areas of concern for reference as you perform more in-depth analysis.

- Has the offeror had an opportunity to answer your concerns?

Consider raising these concerns in fact-finding conversations with the offeror. If the problem is an error in the proposal, bring the error to the offeror's attention so that it can be corrected prior to formal discussions.

**8.2 Analyzing Cost Estimates**

This section identifies points to consider as you analyze other direct cost estimates.

- **8.2.1 - Analyzing Special Tooling And Test Equipment Costs**
- **8.2.2 - Analyzing Computer Service Costs**
- **8.2.3 - Analyzing Professional And Consultant Service Costs**
- **8.2.4 - Analyzing Travel Costs**
- **8.2.5 - Analyzing Federal Excise Tax Costs**
- **8.2.6 - Analyzing Royalty Costs**
- **8.2.7 - Analyzing Preservation, Packaging, And Packing Costs**
- **8.2.8 - Analyzing Preproduction Costs**

**Special Points to Consider in Analysis.** Your analysis of other direct costs should parallel your analysis of
any direct cost. However, you should concentrate your analysis on the following points:

- Determine if other direct costs are properly proposed in accordance with the offeror's estimating and accounting practices, as well as accounting standards applicable to the contract. If the contractor is CAS-covered, the most recent disclosure statement will describe how various categories of costs are to be treated.

- Determine if the proposed other direct cost is reasonable, considering any points identified for special emphasis.

**Develop and Document Your Prenegotiation Position.** As you develop and document your prenegotiation position on other direct costs:

- If you accept the offeror's proposed other direct cost, document that acceptance.

- If you do not accept the proposed other direct cost, document your concerns with the proposal and develop your own prenegotiation position for costs covered by the estimate.

- If you can identify information that would permit you to perform a more accurate analysis of the proposed other direct costs, use the available information. Your analysis is not bound by the estimating methods used by the offeror.

### 8.2.1 Analyzing Special Tooling And Test Equipment Costs

**Special Tooling (FAR 2.101).** Special tooling includes jigs, dies, fixtures, molds, patterns, taps, gauges, and all components of these items including foundations and similar improvements necessary for installing special test equipment, and which are of such a specialized nature that without substantial modification or alteration their use is limited to the development or production of particular supplies or parts thereof or to the performance of particular services. Special tooling does not include material, special test equipment, real property, equipment, machine tools, or similar capital items.

**Special Test Equipment (FAR 2.101).** Includes single or multipurpose integrated test units engineered, designed, fabricated, or modified to accomplish special purpose testing in performing a contract. It consists of items or assemblies of equipment including foundations and similar improvements necessary for installing special test equipment, and standard or general purpose items or components that are interconnected and general purpose items of components the are interconnected and interdependent so as to become a new functional entity for special testing purposes. Special test equipment does not include material, special tooling, real property, and equipment items used for general purposes or property that with relatively minor expense can be made suitable for general purpose use.

**Determine If the Cost Is Properly Proposed.** To determine if the cost of special tooling and test equipment is properly proposed in accordance with the offeror's estimating and accounting practices, as well as accounting standards applicable to the contract, ask questions such as the following:

- Is the proposed tooling or test equipment only usable on the proposed contract or is it general purpose (usable for other products/contracts)?
  
  - If the tooling or test equipment is usable only for the proposed contract, consider the proposed other direct cost.
  
  - If the equipment is general purpose and can be used elsewhere, it should be capitalized and depreciated through the appropriate indirect cost account. Through the application of indirect cost rates, each contract will receive its fair share of the depreciation expense. You should not accept any estimate as other direct cost.

- Can the necessary task be performed at a lower total cost (equipment plus labor) with general purpose tooling or test equipment?

- Do not accept special tooling or test equipment as an other direct cost, when general purpose equipment can do the same job at lower total cost. If general purpose equipment will not do the job at a lower total cost, further consider the cost of the special tooling and test equipment.

**Determine If the Proposed Cost Is Reasonable.** As you determine if the proposed special tooling or test equipment cost is reasonable, ask questions such as the following:
8.2.2 Analyzing Computer Service Costs

Computer Service Center Firms often collect in-house computer costs under a service center and charge users for using the computer services. In-house users of the computer services may be completing tasks in direct support of a specific contract requirement or in indirect cost support of company operations. Accordingly, the service center costs may be charged as direct or indirect costs, depending how the services are used.

Determine If the Cost Is Properly Proposed. To determine if computer service cost is properly proposed in accordance with the offeror's estimating and accounting practices, as well as accounting standards applicable to the contract, you must understand how the offeror collects and allocates computer-related costs. The cognizant Government auditor can be helpful in establishing the appropriateness of the charges as other direct costs.

Determine If the Proposed Cost Is Reasonable. To determine whether the proposed computer service cost is reasonable for contract task requirements, ask questions such as the following:

- Is the amount of the proposed computer effort reasonable for the contract?
- Are the proposed costs based on the computer resources that will actually be used to complete the required tasks?

If direct computerized effort is not required, you should not accept any part of the proposed other direct cost. If a lower effort is required, the Government pricing position should reflect that adjustment.

Many times offeror personnel will have multiple computer resources available to provide the same type of support. Available resources might include: a central computer service center, a local area network,
stand-alone personal computers, and contract computer services. If the work will be completed in stand-alone personal computers, any other direct computer center charge would be unreasonable.

- Does the selected source offer the best value to the offeror and the Government?

The required computer services may be available from an in-house service center and several outside sources. Each source will likely have different costs and benefits to the offeror and the Government.

- If the offeror proposes to obtain the required service as an interorganizational transfer, has the firm met the associated pricing requirements?

Interorganizational transfers can be based on either price or cost. For transfers to be based on price, the contractor must meet the requirements in FAR 31.205-26(e), i.e., it is the established practice of the transferring organization to price interorganizational transfers at other than cost, and the item being transferred qualifies for an exception to the cost or pricing data requirement specified in FAR 15.403-1(b). The price is generally established based on adequate price competition, verifiable through market analysis. If the transfer is based on cost, the contractor should support it as if it were its own cost or pricing data (FAR 15.408 Table 15-2 IIA, Materials and services).

8.2.3 Analyzing Professional And Consultant Service Costs

Professional And Consultant Services (FAR 31.205-33(a)). Professional and consultant services are services rendered by persons who are members of a particular profession or possess a special skill and who are not officers or employees of the contractor. They are generally acquired to obtain information, advice, opinions, alternatives, conclusions, recommendations, training, or direct assistance, such as studies, analyses, evaluations, liaison with Government officials, or other forms of representation.

Determine If the Cost Is Properly Proposed. To determine if professional and consultant services are properly proposed in accordance with the offeror's estimating and accounting practices, as well as accounting standards applicable to the contract, ask questions such as the following:

- Does the task defined for completion by consultants duplicate a task defined for in-house completion?

An estimator preparing an estimate of direct labor cost may not know that the same task is being estimated for performance by consultants.

- Does a cost estimating relationship used to estimate direct labor cost include costs to perform tasks also proposed for performance by consultants?

A task previously performed by in-house personnel may now be designated for performance by consultants. Without specific adjustment, any direct labor cost estimating relationship developed using cost data that include the cost of performing that task will include that task in direct labor estimates for future contracts.

Determine If the Proposed Cost Is Reasonable (FAR 31.205-33). As you determine whether the proposed costs are reasonable for the required professional or consultant services, ask questions such as the following:

- Is the proposed cost reasonable in relation to the service required?

Generally, offerors obtain consultant labor from firms that specialize in providing related services. These firms hire or contract with individuals to work for them and then contract out to firms requiring their services. When there is competition to meet these needs, the offeror can often support the reasonableness of contract labor costs by citing price competition.

- Is the proposed cost necessary and reasonable considering the offeror's capability in a particular area?

If full-time employees are available and capable of performing the required work at a lower cost, question the need for consultants. If consultants are needed, you should still examine any increased cost related to using consultants instead of in-house labor. What was the basis for deciding which type of labor would be used where? The contractor should have performed an analysis in support of selecting the outside consultants over other alternatives.

- What was the past pattern of acquiring such services and what was the cost?

Changes from past practices should be questioned if costs increased as a result of the change.

- Is the service of a type identified as unallowable under Government contracts?
Professional consultant costs are allowable when details of all agreements (e.g., work requirements, rate of compensation, and nature and amount of other expenses, if any) with the individuals or organizations providing the services and details of actual services to be performed are documented.

Professional consultant costs for the following are unallowable:

- Services to improperly obtain, distribute, or use information of data protected by law or regulation.
- Services to improperly influence the contents of solicitations, evaluation or proposals or quotations, or the selection of sources for contract award.
- Services resulting in violation of any law statute or regulation prohibiting improper business practices of conflicts of interest.
- Services performed which are not consistent with the purpose and scope of the services contract or agreement.

**8.2.4 Analyzing Travel Costs**

*Travel Cost (FAR 31.205-46(a)).* Travel costs include the costs for transportation, lodging, meals, and incidental expenses incurred by contractor personnel on official company business. Dollar for dollar, travel cost estimates attract more attention than any other element of most cost proposals. Interest continues to increase in this age when travel costs are rapidly increasing and alternative means of communication (e.g., teleconferencing) are becoming more commonplace.

*Determine If the Cost Is Properly Proposed (FAR 31.205-46).* To determine if travel cost is properly proposed in accordance with the offeror's estimating and accounting practices, as well as accounting standards applicable to the contract, ask questions such as the following:

- Will the traveler charge labor effort to a direct or indirect labor account during travel?

Normally, if the traveler's wages during travel are charged to an indirect labor account, the traveler's travel expenses are also charged as an indirect cost. If the traveler's wages during travel are charged direct to a contract, then the traveler's expenses for travel in connection with the contract are generally charged as a direct cost.

- What is the purpose of the travel?

If an employee who normally charges direct to contracts attends a stress management course, the travel expenses will normally be charged against an indirect training account. If an employee who normally charges time to an indirect cost account travels to a Government office to present a contractually-required demonstration, the travel costs will normally be charged to the contract requiring the demonstration.

*Determine If the Proposed Cost Is Reasonable.* Costs for travel transportation may be based on mileage rates, actual costs incurred, or on a combination thereof, provided the method used results in a reasonable charge. Costs for lodging, meals, and incidental expenses may be based on per diem, actual expenses, or a combination thereof, provided the method used results in a reasonable charge. To determine if the proposed costs are reasonable based on contract requirements, ask questions such as the following:

- Is the proposed travel really necessary?

Sometimes, travel is proposed to meet a contractual requirement on the assumption that the contractor will send someone from the contracting location to the specified location. If the offeror appears to have on-site field representatives who can fulfill the contractual requirement, question whether the travel cost is necessary.

If the contract requires a temporary field office, the proposal may include costs for personnel to travel to the field location and return to the home location at the end of the contract. If so, determine how long the personnel have been assigned to the field location and assess the likelihood that they will leave the site at the conclusion of the contract. Be alert to the possibility that the travel costs are improperly classified (e.g., the costs are truly intended to be additional compensation for field personnel).

Can fewer longer trips replace the proposed travel schedule?

A few long trips generally cost less than the equivalent number of days in travel spread over a larger number of short trips. Assess the practicality of teleconferencing, telephone, or internet meetings, etc.

- Can multiple tasks be accomplished on the same trip?
Often contractor personnel can accomplish several tasks in one trip. If there is a separate travel estimate for each task, determine:

- Whether the estimate is predicated on taking a separate trip for each task; and
- Whether the traveling personnel will likely be able to accomplish several tasks during the same trip.
- Is the proposed number of travelers reasonable?

Many trips involve teams of travelers. The offeror must support the need for each traveler, as well as the need for the trip.
- Is the proposed mode of transportation the most likely actual mode of transportation?

This point is best explained with an example. A travel proposal is based on four employees flying to a nearby city using a commercial airline. In reality, the company usually sends employee groups to nearby cities in a single rental car. While the rental car may be an appropriate means of travel, the cost of travel will not be the same as airline travel.
- Do the proposed transportation, lodging, meal rates comply with FAR travel cost restrictions?

Due to the high visibility of contractor travel on Government business, the FAR restricts travel expenses to the same levels that would pertain to Government employees if they were to make the same trip. Remember, the cost principle sets a maximum limit on these expenses. The cost principle does not set a floor below which the contractor cannot go. If travel rates are available to the contractor below those set in the Government travel regulations, you should use those rates as the most fair and reasonable available.

8.2.5 Analyzing Federal Excise Tax Costs

Common Federal Excise Taxes (FAR 29.201). Federal excise taxes are levied on the sale or use of particular supplies and services. The most common excise taxes are:

- Manufacturer's excise taxes imposed on certain motor-vehicle articles, tires, and inner tubes, gasoline, lubricating oils, coal, fishing equipment, firearms, shells, and cartridges sold by manufacturers, producers or importers
- Special-fuels excise taxes imposed at the retail level on diesel fuel and special motor fuels.

Determine If the Cost Is Properly Proposed (FAR 31.205-41). To determine if Federal excise tax costs are properly proposed in accordance with the offeror's estimating and accounting practices, as well as accounting standards applicable to the contract, ask questions such as the following:

- What items are being assessed a Federal excise tax?
- What type of Federal excise tax is being proposed?

The other direct cost proposal should identify what items are being taxed.

The other direct cost proposal should also identify the Federal excise tax rate that is being used in the estimate and the reason for using that rate.

Determine If the Proposed Cost Is Reasonable (FAR 29.201(c), FAR 29.202, and FAR 29.203). As you determine whether the proposed Federal excise tax costs are reasonable based on contract requirements, ask questions such as the following:

- Is there a Federal excise tax exemption that is applicable to the current acquisition situation?

Offerors can often obtain a Federal excise tax exemption certificate for products delivered under Government contracts. For example:

- No special-fuels excise taxes are imposed under many contracting situations.
- No communications excise taxes are imposed when the supplies and services are for the exclusive use of the Government.
- No highway vehicle use tax will be imposed when vehicles are owned or leased by the Government.
- Should you attempt to take advantage of an available Federal excise tax exemption?
FAR requires you to take maximum advantage of available Federal excise tax exceptions. If you believe that costs related to pursuing the exemption outweigh the corresponding benefits to the Government, contact the cognizant Government legal counsel for advice before accepting any proposed Federal excise tax expense.

- Did the offeror use the proper Federal excise tax rate in estimating other direct cost?

If necessary, contact the cognizant Government legal counsel for advice.

- Did the offeror use the proper base for calculating Federal excise taxes?

Assure that the rate is applied to the proper cost or price base for tax calculation.

### 8.2.6 Analyzing Royalty Costs

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**Royalties** (FAR 27-202 and FAR 52.227-6). Royalties are fees paid by the user to the owner of a right, such as a patented design or process. In Government contracting, the term includes any costs or charges in the nature of royalties, license fees, patent or license amortization costs, or the like for the use of or for rights in patents and patent applications in connection with performing a contract or subcontract.

**Determine If the Cost Is Properly Proposed.** To determine if royalty cost is properly proposed in accordance with the offeror's estimating and accounting practices, as well as accounting standards applicable to the contract, ask questions such as the following:

- Does the proposal include information required to identify the royalties included in the proposal?

If a proposal includes royalties totaling more than $250, the proposal should identify the name and address of the licensor, date of license agreement, patent numbers or patent application serial numbers, description of the patented item or process, and related pricing information.

- Has the offeror provided license agreements to support specific claims in connection with the proposed contract?

A copy of the license agreement will normally be necessary to determine proper pricing and Government rights under the agreement.

- Is the proposed royalty specifically identified with the proposed contract?

Do cognizant Government technical, audit, and patent personnel confirm that the proposed costs are directly related to one or more items of the contract. If the costs are indirectly related to a number of the firm's products, the related costs should be proposed as indirect costs. If the contract items do not benefit from the identified patents, question whether the contract should bear any related expense.

**Determine If the Proposed Cost Is Reasonable** (FAR 27.202, FAR 31.205-37, and FAR 52.27-9). As you determine whether the proposed royalty cost is reasonable, ask questions such as the following:

- Do Government technical personnel confirm that the patented design or process is required to complete the proposed contract?

You will normally need technical assistance to determine if the identified process or design is necessary to complete the contract.

- Does the Government possess a license or right to free use of the patent?

If the patented design or process resulted from work on a Government contract, the Government should hold a royalty-free license to use the patent. Consult the Government office with cognizance over patent matters for assistance.

- Has the patent expired or been found to be invalid or unenforceable?

Consult the Government office with cognizance over patent matters for assistance.

- Is there a Government license rate for the required patent?

There may already be a Government license rate established for the required patent. Consult the Government office with cognizance over patent matters for assistance.

- Is the proposed rate otherwise fair and reasonable?

Compare the proposed fee with any royalties that the offeror pays for similar commercial production. Consider the related cost of any possible alternatives. Consult the Government office with cognizance over patent matters for assistance.

- Does the contract require the contractor to reimburse the Government the amount of
questionable warranties if they are not paid by the contractor?

If the contract is fixed-price and it is questionable whether the contractor or subcontractor will make substantial royalty payments as a result of the contract, insert the FAR clause Refund of Royalties in the contract.

8.2.7 Analyzing Preservation, Packaging, And Packing Costs

Preservation, Packaging, and Packing (FAR 14.201-2(d) and FAR 15.204-2(d)). Each solicitation and contract must describe any necessary preservation, packaging, and packing requirements. These requirements must be adequate to prevent deterioration of supplies and damage due to the hazards of shipping, handling, and storage.

Determine If the Cost Is Properly Proposed. To determine if preservation, packaging, and packing costs are properly proposed in accordance with the offeror’s estimating and accounting practices, as well as accounting standards applicable to the contract, ask questions such as the following:

- Does the offeror normally treat the costs of preservation, packaging, and packing as indirect costs under similar circumstances?

If the offeror normally treats preservation, packaging, and packing costs as indirect costs under similar circumstances, the offeror should offer the same treatment for the proposed contract.

- Are the contract preservation, packaging, and packing requirements of the proposed contract unique?

If the preservation, packaging, and packing requirements are different than other contracts with the offeror, the related costs should probably be other direct costs. Determine If the Proposed Cost Is Reasonable. As you determine whether the proposed preservation, packaging, or packing costs are reasonable, ask questions such as the following:

- Does the proposal include adequate information for analysis of preservation, packaging, and packing costs?

The other direct cost proposal should include a description of proposed preservation, packaging, and packing procedures and materials, as well as the per unit/item cost involved.

- Does the proposed cost appear reasonable when compared with costs incurred for similar packaging?

Government transportation specialists should be able to provide substantial support for your analysis.

8.2.8 Analyzing Preproduction Costs

Preproduction Costs. Preproduction costs, also known as start-up or non-recurring costs, can be characterized as costs associated with the initiation of production under a particular contract or program. Examples of preproduction costs include:

- Preproduction engineering;
- Special tooling;
- Special plant rearrangement;
- Training programs;
- Initial rework or spoilage; and
- Pilot production runs.

Solicitation Requirement. When these costs may be a significant cost factor in an acquisition, consider requiring in the solicitation that the offeror provide:

- An estimate of total preproduction and startup costs;
- The extent to which these costs are included in the proposed price; and
- The intent to absorb, or plan for recovery of, any remaining costs.

Determine If the Cost Is Properly Proposed. To determine if preproduction costs are properly proposed in
accordance with the offeror’s estimating and accounting practices, as well as accounting standards applicable to the contract, ask questions such as the following:

- Is there a mutual understanding between the offeror and the Government concerning what costs should be proposed as preproduction costs?

This should be clearly described in the solicitation. Note that preproduction costs may include other direct costs examined earlier in this chapter (e.g., special tooling). Assure that the same other direct cost is not included in the proposal more than once.

- Is this cost proposed as an other direct cost in accordance with the contractor’s accounting practices?

The proposal must conform with applicable Cost Accounting Standards (CAS) and Generally Accepted Accounting Practices (GAAP).

- Do other estimates of direct and indirect cost, specifically exclude all costs proposed as a preproduction cost?

If this type of cost is not specifically excluded from other categories of direct or indirect cost, the offeror may propose the same cost more than once. Determine if the proposed cost is reasonable. As you determine whether the proposed preproduction costs are reasonable, ask questions such as the following:

- Are proposed costs reasonable for the required preproduction effort?

In most cases, preproduction costs will include a combination of material and labor. The techniques of analysis are the same as those described in previous sections for direct material and direct labor.

- If appropriate, is there an agreement to defer preproduction costs in whole or in part to subsequent contracts?

Since preproduction costs are nonrecurring costs, the contractor may agree to spread the costs across the total projected Government requirement.

- If a successful offeror has indicated an intent to absorb any portion of these costs, does the contract expressly provide that such costs will not be charged to the Government in any future noncompetitive pricing action?

If a successful offeror has indicated an intent to absorb any portion of these costs, assure that the contract expressly provides that such portion will not be charged to the Government in any future noncompetitive pricing action, either directly or through the indirect rates.

9.0 - Chapter Introduction

9.1 - Identifying Pools And Bases For Rate Development
  o 9.1.1 - Identifying Indirect Cost Pools
  o 9.1.2 - Identifying Indirect Cost Allocation Bases

9.2 - Identifying Rate Inconsistencies Over The Allocation Cycle

9.3 - Reviewing The Rate Development Process

9.4 - Examining Proposed Rates

9.5 - Applying Forward Pricing Rates

9.0 Chapter Introduction

This chapter identifies points that you should consider as you evaluate the rates used to allocate indirect costs to various cost objectives.

Analysis Responsibility (FAR 15.402(a) and 15.404-2(a)). While indirect costs cannot be directly identified with the production or sale of a particular product, they are necessary costs of doing business. Some portion of indirect cost is properly allocable to each contract that benefits from that cost. Because indirect costs affect a number of contracts, support from the cognizant auditor and
administrative contracting officer (when one is assigned) can be particularly important to your analysis. However, remember that the contracting officer still has the ultimate responsibility for determining contract price reasonableness.

Flowchart of Indirect Cost Analysis. The following flowchart depicts the key events that must be completed as part of a typical indirect cost analysis:

Indirect Cost (FAR 31.202(b) and 31.203). Two types of costs are typically allocated as indirect costs:
- Costs that cannot practically be assigned directly to the production or sale of a particular product. In accounting terms, such costs are not directly identifiable with a specific cost objective.
  - For example: The firm rents the plant where hundreds of different products are produced. The rent for that plant cannot be traced to any single product, but none of the products could be made efficiently without the plant. The cost accountants who maintain the general accounting ledgers of the firm support every operation of the firm, but their efforts cannot be traced directly to any single product or contract.
- Direct costs of minor dollar amounts may be treated as indirect costs if the accounting treatment
is consistently applied and it produces substantially the same results as treating the cost as a direct cost.

For example: There is usually no net benefit to the contractor or the Government in trying to track every single washer or rivet to a single cost objective. The cost of such items is commonly treated as an indirect cost.

**Indirect Cost Importance in Cost Analysis.** While indirect costs are an important consideration in the analysis of every cost proposal, the share of cost that they represent will vary from firm to firm and industry to industry. For example, expect indirect costs to represent a larger share of a cost proposal for heavy equipment manufacture than one for contract services. Manufacturing operations typically require substantial investment in plant and equipment --the very type of spending that generally cannot be directly charged to any one product. Services generally do not require a similar level of investment in plant and equipment.

**Composition of Indirect Costs.** The term "indirect costs" covers a wide variety of cost categories and the costs involved are not all incurred for the same reasons. The number of indirect cost accounts in a single firm can range from one to hundreds. In general, indirect cost accounts fall into two broad categories:

- **Overhead.** These are indirect costs related to support of specific operations. Examples include:
  - Material Overhead;
  - Manufacturing Overhead;
  - Engineering Overhead;
  - Field Service Overhead; and
  - Site Overhead.

- **General and Administrative (G&A) Expenses.** Theses are management, financial, and other expenses related to the general management and administration of the business unit as a whole. To be considered a G&A Expense of a business unit, the expenditure must be incurred by, or allocated to, the general business unit. Examples of G&A Expense include:
  - Salary and other costs of the executive staff of the corporate or home office.
  - Salary and other costs of such staff services as legal, accounting, public relations, and financial offices.
  - Selling and marketing expenses.

**Obtain Necessary Audit and ACO Analysis Support (FAR 15.404-2(c) and 15.407-3).** In most cases, the Government auditor and the administrative contracting officer (ACO) are the two Government Acquisition Team members who have the most in-depth knowledge of a firm's indirect costs and indirect cost allocation procedures. The auditor is the only Government Acquisition Team member with general access to the offeror's accounting records. The ACO is responsible for negotiating Forward Pricing Rate Agreements (FPRAs), including indirect cost rate agreements.

**9.1 Identifying Pools And Bases For Rate Development**

This section identifies points that you should consider as you identify the bases and pools needed to calculate the rates used to allocate indirect costs to various cost objectives.

- **9.1.1 - Identifying Indirect Cost Pools**
- **9.1.2 - Identifying Indirect Cost Allocation Bases**

**Indirect Cost Allocation Rates.** Since indirect costs are not directly related to a single cost objective, how do we know when they should be charged to a particular product? We use indirect cost rates. As a larger share of a contractor's direct effort (e.g., manufacturing) is required to produce a particular product, use of an indirect cost rate will assure that a larger share of the indirect costs that the contractor incurs in support of that direct effort (e.g., costs such as supervision, utilities, and maintenance) is charged to the contract.

**Indirect Cost Rate Formula.** Indirect cost rates are expressed in terms such as dollars per hour or percentage of cost. Indirect cost rates are calculated for each accounting period by dividing a pool of
indirect cost for the period by the allocation base (e.g. direct labor hours or direct labor cost) for the same period.

\[
\text{Indirect Cost Rate} = \frac{\text{Indirect Cost Pool}}{\text{Indirect Cost Allocation Base}}
\]

Once a rate is established, you can use it to determine the amount of indirect cost that should be allocated to the contract. Simply multiply the rate by the estimated or actual amount of the allocation base in the contract for that period. Contracts with a greater share of the allocation base (e.g., direct labor dollars) will be charged a greater share of the related indirect cost pool (e.g., manufacturing overhead). Contracts with a smaller share of the base will be charged a smaller share of the related indirect cost pool.

### 9.1.1 Identifying Indirect Cost Pools

**Indirect Cost Pool Definition (FAR 31.203(b)).** For each indirect cost rate, identify the **INDIRECT COST POOL**.

\[
\text{Indirect Cost Rate} = \frac{\text{INDIRECT COST POOL}}{\text{Indirect Cost Allocation Base}}
\]

An indirect cost pool is a logical grouping of indirect costs with a similar relationship to the cost objectives. For example, engineering overhead pools include indirect costs that are associated with engineering effort. Likewise, manufacturing overhead pools include indirect costs associated with manufacturing effort.

A properly developed indirect cost pool, should permit allocation of the included indirect costs in a manner similar to the allocation that would occur if the firm allocated each indirect cost separately. **For example:** The firm could allocate the labor for maintenance of the building housing the firm's engineers and the electricity for the same building using two different indirect cost rates. Logically, both would be allocated based on the use of engineering services. Since both would use the same or similar allocation base, combining them into a pool (along with other engineering-related indirect costs) simplifies and clarifies the allocation process.

**Primary Indirect Cost Pools.** The indirect cost pools used to make the final allocation of indirect costs to cost objectives are known as primary pools. The table on the next page lists some of the more common primary pools and types of costs often found in each pool. A typical cost identified in the table with a particular pool (e.g., inbound transportation is identified with material overhead) could be:

- Combined with the related indirect costs into a single indirect cost pool (e.g., a single material overhead pool);
- Combined with some of the related indirect costs into one of several related indirect cost pools (e.g., indirect labor could be combined with one or two related expenses into a single pool).
- Allocated individually.

Remember, every firm's accounting system is different. The examples in the table are only typical; do not regard them as the only correct way to group costs.

<table>
<thead>
<tr>
<th>Common Pools</th>
<th>Typical Costs Found in the Pool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Overhead</td>
<td>• Acquisition (Purchasing)</td>
</tr>
<tr>
<td></td>
<td>• Inbound transportation</td>
</tr>
<tr>
<td></td>
<td>• Indirect labor</td>
</tr>
<tr>
<td></td>
<td>• Employee related expenses (shift &amp; overtime premiums, employee taxes, fringe benefits)</td>
</tr>
<tr>
<td></td>
<td>• Receiving and inspection</td>
</tr>
</tbody>
</table>
| Operations Overhead (e.g., Manufacturing, Engineering, Field Service, and Site Operations) | • Indirect labor and supervision  
• Perishable tooling (primarily in manufacturing overhead)  
• Employees related expenses (shift & overtime premiums, employee taxes, fringe benefits)  
• Indirect material & supplies (small tools, grinding wheels, lubricating oils)  
• Fixed charges (e.g., depreciation, insurance, rent, property taxes)  
• Downtime of direct employees (training, vacation pay, regular pay) when not working on a specific contract/job |
| --- | --- |
| General & Administrative Expense | • General & executive office  
• Staff services (legal, accounting, public relations, financial)  
• Selling and marketing  
• Corporate or home office  
• Independent research and development (IR&D)  
• Bid and proposal (B&P)  
• Other miscellaneous activities related to overall business operation |

**Secondary Indirect Cost Pools.** A secondary pool is an intermediate pool that is used to allocate costs to primary pools. Some indirect costs obviously belong to one specific primary pool. For example, the salary of a manufacturing manager would logically be charged as part of a manufacturing overhead pool. The company president's salary would be part of the general and administrative cost pool. These costs therefore would appear only in the appropriate primary pool.

The proper account for other indirect costs may not be so obvious. For example, a building is shared by manufacturing and engineering. Should facility expenses (e.g., building depreciation, utilities, and maintenance) be charged to engineering or manufacturing? The answer is that both should share the cost based on a causal or beneficial relationship with the cost involved. For example, facilities expenses could be allocated based on the share of available floor space occupied.

A reasonable share of each cost could be separately allocated to the appropriate primary pool, or the related costs could be grouped and allocated together. If the costs are grouped for allocation, the cost grouping is known as a secondary pool.

The figure below depicts the allocation of the expenses related to a shared facility based on the number of square feet occupied by each occupant. If engineering occupies 60 percent of the building, 60 percent
of the facility-related expenses will be allocated to the engineering overhead pool. Forty percent will be allocated to the manufacturing overhead pool.

Service Centers. Service centers are unique in that they include costs that can be allocated as a direct cost or an indirect cost depending on the particular circumstances. Primary allocation concerns include identification of:

- The user of the service and
- The purpose of that use.

For example: The cost of a copy center are allocated based on the number of copies reproduced.
- A copy of a manufacturing drawing might be charged to manufacturing overhead.
- A copy of an engineering report might be charged to engineering overhead.
- A copy of the facility manager's weekly calendar might be charged to the facilities secondary pool.
- A deliverable copy of a research report prepared for the Government might be charged as a direct cost.

Remember that the firm must clearly define how service center costs will be allocated. Definition of the circumstances related to each different type of accounting treatment is particularly important. Clear definition will help avoid erroneous double charges that occur when the firm charges a service center cost as a direct cost while charging the same or similar cost as an indirect cost.
9.1.2 Identifying Indirect Cost Allocation Bases

**Indirect Cost Allocation Base Definition (FAR 31.203(b)).** For each indirect cost rate, identify the indirect cost allocation base.

\[
\text{Indirect Cost Rate} = \frac{\text{Indirect Cost Pool}}{\text{INDIRECT COST ALLOCATION BASE}}
\]

An indirect cost allocation base is some measure of direct contractor effort that can be used to allocate pool costs based on benefits accrued by the several cost objectives. Examples of typical bases:
- Direct labor hours;
- Direct labor dollars;
- Number of units produced; and
- Number of machine hours.

The type of base determines whether the indirect cost rate will take the form of a percentage or a dollar rate per unit of measure. The following are some common bases that could be used in manufacturing indirect cost allocation:

- Dollars per Direct Labor Hour = \(\frac{\text{Pool Dollars}}{\text{Direct Labor Hours}}\)
- Percent of Direct Labor Dollars = \(\frac{\text{Pool Dollars}}{\text{Direct Labor Hours}} \times 100\)
- Dollars per Unit of Production = \(\frac{\text{Pool Dollars}}{\# \text{ of Production Units}}\)
- Dollars per Machine Hour = \(\frac{\text{Pool Dollars}}{\text{Machine Hours}}\)

Whatever the allocation base, the larger a contract's share of the allocation base for the accounting period, the larger the contract's share of the related indirect cost.

**Selecting a Base.** When selecting an allocation base for the indirect cost pool, firms consider the type of indirect costs in the pool and whether the base will provide a reasonable representation of the relative consumption of pooled indirect costs by direct cost activities. Each allocation base should be representative of the breadth of activities supported by the pooled indirect costs. There should be a logical relationship between the pool costs and the allocation base. That is, for each increase in the allocation base, pool costs are also likely to increase.

**For example:** If the firm's manufacturing operation is labor intensive and the pool is predominantly labor related (e.g., supervisory labor and fringe benefit costs) the contractor will probably select a base related to labor effort for allocating manufacturing overhead costs. If the manufacturing operation is automated with little labor effort, the contractor will probably select a base related to the machinery use (e.g., machine hours).

**Common Allocation Bases.** The following table represents some of the more common bases and the type of pools that they are typically used to allocate:
<table>
<thead>
<tr>
<th>Category</th>
<th>Symbol</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost Input 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of Value-Added 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Labor Dollars</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Direct Labor Hours</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Machine Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units of Product 3</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td># of Purchase Orders</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Direct Material Cost</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Total Payroll Dollars</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Head Count</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Square Footage</td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>

1 Also referred to as the "Cost of Goods Manufactured" or "Production Cost" during the accounting period. It typically includes all costs except general and administrative expense.
2 Also referred to as "Conversion Cost." It is the sum of direct labor costs, other direct costs, and associated indirect costs.
3 Units of Product refers to units of final product produced. It is only an acceptable base when final products are relatively homogeneous and represent a reasonable measure of benefit from the appropriate pool.

### 9.2 Identifying Rate Inconsistencies Over The Allocation Cycle

**Importance of Accurate Indirect Cost Rate Estimates.** Accurate indirect cost rate estimates are essential for effective cost analysis, because actual indirect cost rates will not be known until after the end of the accounting period. By that time, part or all of the contract effort will be complete.

Rate estimates are used for forward pricing, as well as progress payments or cost-reimbursement. You and the contractor may even agree to use estimated quick-closeout indirect cost rates for final pricing of flexibly-priced contracts, before actual rates are known for certain.

**Points to Consider.** As you review the estimating process used by the contractor in indirect cost rate development:

- Identify apparent rate inconsistencies over the indirect cost allocation cycle.
- Assure that concerns about the inconsistencies are well documented.

**Indirect Cost Allocation Cycle ([FAR 15.407-3](https://www.federalregister.gov), [42.701](https://www.federalregister.gov), [42.704](https://www.federalregister.gov), and [42.705](https://www.federalregister.gov)).** Indirect cost allocation typically follows the cycle depicted in the following figure:
• **Forward Pricing.** During this phase, the contractor proposes forward pricing rates and uses those rates in contract proposal pricing. Initial estimates are often developed several years before the accounting period even begins. However, estimates should be updated as more accurate cost data become available. As part of your cost analysis, you must assure that all forward pricing rates used in contract pricing are reasonable.

• **Contract Billing.** When a contract involves progress payments or cost reimbursement, Government personnel must monitor contract billing rates to assure that payments or reimbursements based on those rates are reasonable. During each cost accounting period, rates should become more accurate as more actual cost data become available. The contracting officer or auditor responsible for determining final indirect cost rates is also responsible for determining contract the billing rates.

• **Final Pricing.** After the cost accounting period is completed, contractors can calculate actual indirect cost rates to determine actual contract cost.
  - For contracts that require final pricing (e.g., fixed-price incentive and cost-reimbursement contracts), the responsible contracting officer or auditor must determine final overhead rates for the contract. This determination will be based on the Government's evaluation of the final overhead rate proposal submitted by the contractor.
  - Unfortunately, months or years may be required to complete this process. Under certain conditions set forth in the FAR, you and the contractor may agree to use estimated quick-closeout indirect cost rates for final pricing of flexibly-priced contracts, before actual rates are known for certain (FAR 42.708(a)).

*Rates are Part of a Continuing Allocation Cycle.* Remember that that forward-pricing rates, billing rates, and final rates are all part of a continuing indirect cost allocation cycle.

- Forward pricing rates will affect budget decisions and the rates used in contract billing.
- Billing rate estimates will affect the need for cost adjustment during final contract pricing.
- Final rates can be used to measure the actual allocation of direct cost to a particular cost objective. In addition, the data used to support final rates will become part of the data available for estimating forward pricing and billing rates for subsequent accounting periods.

*Identifying Inconsistencies in Cost Allocation Cycle Information.* As you review the estimating process used in rate development, identify any inconsistencies regarding the relationship between the proposed rates and related rates in the indirect cost allocation cycle. Ask questions such as the following:

- How does the proposed rate compare with other rates in the indirect cost allocation cycle?
For example, proposed forward pricing rates and billing rates for the same accounting period should be identical or very similar.

- Has rate accuracy consistently improved throughout the allocation cycle?

The relationship between past forward pricing rates and actual rates should provide information on the firm’s past estimating accuracy. Billing rates near the end of the accounting period should be close to the actual rates experienced for the period. Quick closeout rates should be comparable to actual rates.

- Does the contractor update rate estimates as more information becomes available?

Indirect cost rates for each accounting period are estimates until actual costs are determined after the end of the period. However, the rates should be updated as more information becomes available. Contractor personnel should be monitoring the indirect rates and the underlying budgetary throughout the period. Typically, the contractor will document this monitoring process which can be a valuable source in evaluating whether the rates continue to be reasonable as events and conditions become known.

9.3 Reviewing The Rate Development Process

Points to Consider. As you continue to review the estimating process used by the contractor in indirect cost rate development:

- Identify apparent weaknesses in the indirect cost rate estimating process.
- Assure that concerns about the estimating process are well documented.

Review Information on the Steps Used to Estimate Indirect Cost Rates. Initial indirect cost rate estimates for a particular accounting period are generally developed before the period begins. In fact, contractors pricing long-term contracts are frequently required to forecast rates three to five years into the future. Rate estimates should be updated as more information becomes available, both before and during the accounting period to which the rate applies.

Review information submitted by the offeror regarding the steps used to estimate indirect cost rates for each accounting period. While the exact process will vary from firm to firm, the general process should follow four steps:

- **Estimate Sales Volume for the Period** -- the total goods and services that the firm expects to sell to ALL customers during each forecast period (e.g., fiscal year of the firm).

- **Estimate Indirect Cost Allocation Bases for the Period** -- the measures of direct contractor activity that will be used to allocate pool costs based on the benefits accrued by the several cost objectives. Measures can take the form of dollars, hours, or any other appropriate measure.

- **Estimate Indirect Cost Pools for the Period** -- logical groupings of indirect costs with a similar relationship to the cost objectives.

- **Estimate Indirect Cost Rates for the Period** -- divide each indirect cost pool by the appropriate allocation base.

Review Information on Estimated Sales Volume for the Period. The starting point for any indirect cost rate estimate should be a sales forecast for the accounting period. An accurate estimate of volume is essential to estimating indirect cost rates, because indirect cost pools are typically composed primarily of fixed and semivariable costs. As fixed costs and the fixed component of semivariable costs are spread over more and more direct effort, indirect cost rates will decline. As a result, lower sales volume estimates will result in higher rates, and higher volume estimates will result in lower rates. Logically, contractors normally prefer to conservatively estimate business volume, so as not to under estimate cost. However if the contractor is too conservative, the result may be unreasonably high indirect cost rates.

For a manufacturer, estimators will consider the production and sales for each product line. For services, estimators will consider the number of contracts that the firm expects to be awarded and the effort required to complete each contract. Separate forecasts are developed for each accounting period (normally one year).

As you review the offeror’s sales estimate, ask questions such as the following:

- Is the sales forecast used for estimating indirect cost rates based on the best information available?

Estimates made prior to the beginning of the accounting period may be based on relatively speculative
data. However, estimates should become firmer as more detailed plans are formulated for the period. Estimates should become firmer still as actual sales data for the period become available.

- Does the sales forecast consider all work likely to benefit from the indirect cost pool?

To produce accurate rates, forecasts must include all work projected to benefit from the indirect cost pool during the accounting period. Estimates should include all work that is on contract, options that may be exercised, proposals with a high probability of success, solicitations in hand, and other anticipated customer requirements.


Next, the firm should translate the sales volume forecast into production or contract performance schedules. Given the projected schedules, the estimator can forecast total direct effort associated with operations during each forecast period. Estimates of the direct effort will include estimates of the direct labor and material requirements for the period and the allocation base for each indirect cost rate.

For cost or pricing data submissions, FAR Table 15-2 requires that the proposal state how the offeror computed and applied indirect costs, including cost breakdowns, and showing trends and budget data, to provide a basis for evaluating the reasonableness of proposed rates.

That information should include:

- An estimate of the size of the allocation base.
- An explanation of how the allocation base was estimated.
- The date that the allocation base estimate was developed.
- Data on the historical trends in the allocation base.
- An explanation of any significant differences between the historical, proposed, and budgeted dollar values of the allocation base.

As you review the contractor's indirect cost allocation base estimate, ask questions such as the following:

- What is the relationship between the estimated indirect cost allocation base and the estimated sales volume?

Make sure that you understand the relationship as described by the contractor. Document any unexplained differences between the relationship described by the contractor and observed historical relationships for further analysis.

- Are there any differences between the proposed indirect cost allocation base and related budget estimates?

Many times the estimated indirect cost allocation base is different than the internal budget for the same category of cost. The firm may state that it wants to challenge managers and hold the difference in reserve. Make sure that you understand the contractor's rationale, as well as the realism of any differences between current estimates and historical trends.

- Have past differences between allocation base estimates and actual allocation bases for the same period been adequately explained?

Look for patterns such as consistent underestimation of the allocation base.

- Are the data used to develop the allocation base estimates accurate, complete, and current?

By law, all cost or pricing data must be accurate, complete, and current. Information other than cost or pricing data should also be up to date. In particular, you should carefully review any allocation base involved in any allegations of defective pricing.

- Did the cognizant auditor or administrative contracting officer question any of the indirect cost allocation base estimates prepared by the contractor?

Because indirect cost pools apply across a broad spectrum of contracts, the cognizant auditor and administrative contracting officer (when one is assigned) are normally most familiar with the factors affecting estimates.

Review Information on Estimated Indirect Cost Pools for the Period. Given the estimated volume of work to be performed, the firm should next estimate the likely size of each indirect cost pool. As described
above, indirect cost pools are typically composed primarily of fixed and semivariable costs. As volume increases, variable indirect costs will increase. However, the indirect cost rate will normally decrease because the fixed portion of the pool will be spread over a larger volume. As with the allocation base, the offeror must provide adequate supporting documentation. That documentation should include the following information:

- The estimated dollar value of the pool.
- An explanation of how the pool was estimated.
- The date that the pool estimate was developed.
- Data on historical trends in the pool.
- An explanation of any significant differences between the historical, proposed, and budgeted dollar values of the pool.

As you review the contractor’s indirect cost pool estimate, ask questions such as the following:

- What is the relationship between the estimated indirect cost pool and the estimated sales volume?

Make sure that you understand the relationship as described by the contractor. Document any unexplained differences between the relationship described by the contractor and observed historical relationships for further analysis.

- What is the relationship between the estimated indirect cost pool and the estimated allocation base?

Make sure that you understand the historical trends in the relationship between the indirect cost allocation base and the indirect cost pool. You can use this relationship to identify significant changes in the estimated rate structure. Document any unexplained differences between the historical relationship and the proposed rates for further analysis.

- Are there any differences between the proposed indirect cost pool and related budget estimates?

Make sure that you understand the contractor’s rationale, as well as the realism of any differences between current estimates and historical trends.

- Have past differences between indirect cost pool estimates and actual pools for the same period been adequately explained?

Look for patterns such as consistent overestimation of the pool. Document any unexplained differences for further analysis.

- Did the contractor account for anticipated unallowable expenses in the proposed indirect cost pool?

Unlike direct costs, total pool expenses are more likely to include unallowable expenses (FAR 31.205). Typically, contractors have processes in place to identify unallowable expenses as they are incurred, as well as after the accounting period through a “scrubbing” process. Development of the indirect cost pool occurs prior to the scrubbing process, so the contractor will need to estimate a reasonable amount of unallowable expenses and remove them from the rate calculation.

- Are the data used to develop the indirect cost pool estimates accurate, complete, and current?

By law, all cost or pricing data must be accurate, complete, and current. Information other than cost or pricing data should also be up to date. In particular, you should carefully review any cost elements involved in any allegations of defective pricing.

- Did the cognizant auditor or administrative contracting officer question any of the indirect cost pool estimates prepared by the contractor?

Because indirect cost pools apply across a broad spectrum of contracts, the cognizant auditor and administrative contracting officer (when one is assigned) are normally most familiar with the factors affecting estimates.

Review Information on Indirect Cost Rate Estimates for the Period. When the indirect cost allocation base and the indirect cost pool estimates have been completed, the only task remaining is to divide the estimated pool by the estimated allocation base to establish the indirect cost rate.
The table below presents rate forecasts for the next three years. Note that the base and pool estimates for material, engineering, and manufacturing, become the estimate of total cost input, the base for the G&A expense rate. [A5]

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Estimate</td>
<td></td>
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</tr>
<tr>
<td>Sales Estimate</td>
<td>1,000</td>
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<td>1,300</td>
</tr>
<tr>
<td>Direct Material</td>
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<td>$14,762,049</td>
</tr>
<tr>
<td>Material Overhead</td>
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<tr>
<td>Engineering Direct Labor</td>
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<td>$1,596,105</td>
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<td>$1,910,450</td>
<td>$1,811,992</td>
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<tr>
<td>Manufacturing Overhead</td>
<td>$3,679,850</td>
<td>$4,250,150</td>
<td>$4,292,500</td>
</tr>
<tr>
<td>Total Cost Input</td>
<td>$23,259,771</td>
<td>$28,178,889</td>
<td>$25,160,719</td>
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<tr>
<td>G&amp;A Expense</td>
<td>$4,426,381</td>
<td>$4,875,614</td>
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</tr>
<tr>
<td>Total Cost</td>
<td>$27,686,152</td>
<td>$33,054,502</td>
<td>$29,727,300</td>
</tr>
<tr>
<td>Material Overhead Rate (With Direct Material Cost Base)</td>
<td>9.6%</td>
<td>8.7%</td>
<td>10.6%</td>
</tr>
<tr>
<td>Engineering Overhead Rate (With Engineering Direct Labor Cost Base)</td>
<td>64.7%</td>
<td>62.8%</td>
<td>63.5%</td>
</tr>
<tr>
<td>Manufacturing Overhead Rate (With Manufacturing Direct Labor Cost Base)</td>
<td>250.8%</td>
<td>222.5%</td>
<td>236.9%</td>
</tr>
<tr>
<td>G&amp;A Expense Rate (With Total Cost Input Base)</td>
<td>19.0%</td>
<td>17.3%</td>
<td>18.1%</td>
</tr>
</tbody>
</table>

Normally, you should expect more detail in support of rate calculations. Consider the requirements of FAR Table 15-2 whenever you establish requirements for certified cost or pricing data or data other than certified cost or pricing data to support indirect cost rates. Note that the 19[20]X7 Manufacturing Overhead and G&A Expense examples on the following pages provide a breakdown of both the indirect cost allocation base and the indirect cost pool, including historical data to facilitate trend analysis. Any contractor should be able to provide you with this level of data along with detailed rationale for rate projections. Most contractors will provide you with substantially more detailed data. Assure that any data submitted meets solicitation/contract requirements. As you review the contractor's rate calculation and the overall data submission, ask questions such as the following:
• Has the contractor's estimating system been disapproved by the Government?
An inadequate estimating system increases the risk that the system will not provide an adequate cost estimate. Review the condition to determine the extent of the potential impact, if any, on the development of the price proposal.
• Does the overall data submission comply with the requirements of FAR and the solicitation?
Any data submission that does not meet FAR or solicitation/contract requirements deserves special attention during cost analysis. [A6]

<table>
<thead>
<tr>
<th>Manufacturing Overhead Rate History and Projection</th>
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<tr>
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<tr>
<td>Pool</td>
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<tr>
<td>Personnel Expenses</td>
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<tr>
<td>Category</td>
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<tr>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Recruiting &amp; Hiring</td>
</tr>
<tr>
<td>Employee Relocation</td>
</tr>
<tr>
<td>Employee Pension Fund</td>
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<tr>
<td>Salaried Hourly</td>
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<tr>
<td>Training, Conferences, &amp; Technical Meetings</td>
</tr>
<tr>
<td>Educational Loans &amp; Scholarships</td>
</tr>
<tr>
<td>Supplies &amp; Services</td>
</tr>
<tr>
<td>General Operating</td>
</tr>
<tr>
<td>Maintenance: Building</td>
</tr>
<tr>
<td>Stationary, Printing, &amp; Office Supplies</td>
</tr>
<tr>
<td>Material O/H on Supplies</td>
</tr>
<tr>
<td>Maintenance: Office Equipment</td>
</tr>
<tr>
<td>Rearranging</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Heat, Light, &amp; Power</td>
</tr>
<tr>
<td>Account Title</td>
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<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Pool</td>
</tr>
<tr>
<td>Salaries &amp; Wages</td>
</tr>
<tr>
<td>Indirect Labor</td>
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<tr>
<td>Additional Compensation</td>
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<tr>
<td>Overtime Premium</td>
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<tr>
<td>Sick Leave</td>
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<td>Holidays</td>
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<td>Category</td>
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<tr>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Suggestion Awards</td>
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<tr>
<td>Vacations</td>
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<tr>
<td><strong>Personnel Expenses</strong></td>
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<tr>
<td>Compensation Insurance</td>
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<td>SUTA/FUTA</td>
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<td>Dues &amp; Subscriptions</td>
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<td>Employee Relocation</td>
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<td>Employee Pension Fund:</td>
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<td>Salaried Hourly</td>
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<tr>
<td>Hourly</td>
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<tr>
<td>Training, Conferences, &amp; Technical Meetings</td>
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<td>Courtesy Meal Expense</td>
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<tr>
<td>Educational Loans &amp; Scholarships</td>
</tr>
<tr>
<td>Supplies</td>
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<td>Operating</td>
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<tr>
<td>Category</td>
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<tr>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Maintenance - Building</td>
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<tr>
<td>Stationary, Printing, &amp; Office Supplies</td>
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<tr>
<td>Postage</td>
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<tr>
<td>Material O/H on Supplies</td>
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<tr>
<td>Maintenance - Equipment</td>
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<tr>
<td>Other</td>
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<tr>
<td>Public Utilities</td>
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<tr>
<td>Telephone</td>
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<tr>
<td>Heat, Light, &amp; Power</td>
</tr>
<tr>
<td>Miscellaneous Income &amp; Expense</td>
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<tr>
<td>Legal &amp; Auditing</td>
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<td>Professional Services</td>
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<tr>
<td>Patent Expense</td>
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<td>Public Relations</td>
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<td>Interdivisional Transfers</td>
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<tr>
<td>At Cost</td>
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<tr>
<td>Corporate Expense</td>
</tr>
<tr>
<td>Headquarters</td>
</tr>
<tr>
<td>Fixed Charges</td>
</tr>
<tr>
<td>Insurance Property</td>
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<td>--------------------------</td>
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<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Base</th>
<th>Total Cost Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Ovhd Expense</td>
<td>$1,025,345,612</td>
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<tr>
<td></td>
<td>$1,153,612</td>
</tr>
<tr>
<td></td>
<td>$1,023,500</td>
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<tr>
<td>Engineering Direct Labor</td>
<td>$1,426,46,420</td>
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<tr>
<td></td>
<td>$1,579,595</td>
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<tr>
<td></td>
<td>$1,582,300</td>
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<tr>
<td>Manufacturing Ovhd Expense</td>
<td>$3,416,816</td>
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<tr>
<td></td>
<td>$3,545,336</td>
</tr>
<tr>
<td></td>
<td>$3,679,850</td>
</tr>
<tr>
<td>Manufacturing Direct Labor</td>
<td>$1,340,878</td>
</tr>
<tr>
<td></td>
<td>$1,407,931</td>
</tr>
<tr>
<td></td>
<td>$1,467,200</td>
</tr>
<tr>
<td>Materials Ovhd Expense</td>
<td>$1,234,421</td>
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<tr>
<td></td>
<td>$1,296,179</td>
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<tr>
<td></td>
<td>$1,361,000</td>
</tr>
<tr>
<td>Direct Materials</td>
<td>$13,056,987</td>
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<tr>
<td></td>
<td>$13,484,836</td>
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<tr>
<td></td>
<td>$14,145,921</td>
</tr>
<tr>
<td>Total Base</td>
<td>$21,460,256</td>
</tr>
<tr>
<td></td>
<td>$22,467,489</td>
</tr>
<tr>
<td></td>
<td>$23,259,771</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate</th>
<th>G&amp;A Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19.3%</td>
</tr>
<tr>
<td></td>
<td>19.3%</td>
</tr>
<tr>
<td></td>
<td>19.4%</td>
</tr>
<tr>
<td></td>
<td>19.0%</td>
</tr>
</tbody>
</table>

### 9.4 Analyzing Proposed Rates

*Caution for Indirect Cost Rate Analysis.* When you analyze indirect cost rates, do not fall into the trap of looking at a rate and immediately determining that it is too high or too low without analysis of the indirect cost allocation base and indirect cost pool. A rate of 400 percent can be reasonable and a rate of 10 percent can be unreasonable depending on the type of allocation base, reasonableness of allocation base estimates, types of costs in the pool, reasonableness of the pool cost estimates, and the overall effect on total cost. Also avoid the trap of assuming that a rate for one firm is necessarily a good yardstick for evaluating the rates of other firms in the same industry and/or of the same size.

*Steps for Indirect Cost Rate Analysis.* There are six general steps that you should follow as you analyze indirect cost rate estimates:
• Develop an analysis plan.
• Identify unallowable costs.
• Analyze the indirect cost allocation base estimate.
• Convert the indirect cost allocation base and the indirect cost pool to constant-year dollars.
• Analyze the base/pool relationship.
• Develop and document your pricing position.

**Develop an Analysis Plan** *(FAR 15.404-2(c)).* Develop a plan that tailors your in-depth indirect cost analysis efforts to areas that demonstrate the greatest cost risk to the Government. Unless required by agency or local procedures, the plan need not be in writing, but it should consider the risk to Government in terms of dollars involved and probability that the rates developed by the contractor are reasonable estimates of actual indirect cost rates. As you prepare your plan, your analysis of risk to the Government should include questions such as the following:

- Is there an existing Forward Pricing Rate Agreement (FPRA) or Forward Pricing Rate Recommendation (FPRR)?

When an administrative contracting officer (ACO) is assigned to the offeror, contact the ACO to determine if there is an FPRA or FPRR in place. If there is, the need for further rate analysis will be greatly reduced (See **Section 9.5**).

- Can you obtain information from a recent indirect cost rate audit?

Audit information can greatly simplify the process of rate analysis when there is no FPRA or FPRR. However, an audit recommendation does not relieve the contracting officer from the responsibility to evaluate indirect cost rates. Contact the cognizant auditor to obtain information on any indirect cost rate audit performed within the last 12 months. When an audit is available, do not request a new indirect cost rate audit unless the contracting officer considers the previous audit inadequate for pricing the current contract. Reasons for requesting a new audit include:

- Substantial changes in the offeror's rate structure;
- Audit-identified weaknesses in the offeror's rate development and tracking procedures;
- Recent changes in the offeror's business volume; or
- Recent changes in the offeror's production methods.

- Did your review of the indirect cost allocation cycle identify any inconsistencies in the relationship between related rates?

Inconsistencies in the relationship between the proposed rates and related rates in the indirect cost allocation cycle may indicate that the offeror is not properly updating and reevaluating rates throughout the cycle.

- Did your review of the indirect cost rate estimating process identify any apparent weaknesses?

Any apparent weaknesses in the estimating process increases the cost risk to the Government. Normally, you should increase your analysis efforts in any areas with identified weaknesses.

- Have the offeror's estimates been accurate in the past?

Any contractor can incorrectly estimate an indirect cost rate. However, if past rates have been poor estimates of actual indirect costs, the risk to the Government is greater than it is in situations where past estimates have been quite accurate. As you plan, consider both the size and the consistency of the overestimates.

**For example:** The following table examines the accuracy of historical rate estimates made in the year prior to the rate period:

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate Projection</th>
<th>Rate Projected</th>
<th>Projected</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Subtract Actual Rate From the</td>
</tr>
</tbody>
</table>
Note that the company overestimated this indirect cost rate in every year. The average overestimate was 1.8 percent, calculated as follows:[A8]

If all company contracts during those three years were priced using the company estimated rate, customers would have been charged an average of $101.80 for every $100 in actual costs.

- How many dollars are at risk?

Consider the cost of analysis and potential cost savings from the analysis. For example, it would make little sense to invest $30,000 in the analysis of a $20,000 indirect cost estimate.

- How dependent is the estimated indirect cost pool on the historical costs?

Some contractors base their estimate almost entirely on the volume of indirect expenses that were incurred in prior accounting periods. To the extent that the estimate is based on actual costs, you should assess the reliability of the contractor's accounting system, particularly fundamentals such as the ability to segregate direct and indirect expenses. Generally, the cognizant auditor will have conducted either a pre-award or post-award accounting system survey which addresses the system's capability to produce consistent and reliable results. The auditor should be consulted for assistance with significant costs. When historical costs figure prominently in the estimate, determine if reasonable adjustments were made to reflect anticipated changes to future operations.

- Does the indirect cost pool include a substantial amount of fixed cost?

As the percentage of fixed indirect costs increases, the risk associated with inaccurate allocation base estimates also increases. When a relatively high percentage of indirect costs are fixed, the indirect cost rate can change dramatically with any change in the allocation base. When most indirect costs are variable, changes in the allocation base will have a less dramatic affect on the rate.

Identify Unallowable Costs (FAR 31.201-6). Costs that are expressly unallowable or mutually agreed to be unallowable must be identified and excluded from any proposal, billing, or claim related to a Government contract. When an unallowable cost is incurred, any cost related to its incidence is also unallowable.

Contractors must identify unallowable indirect costs whenever indirect cost rates are proposed, established, revised, or adjusted. The detail and depth of records required as rate support must be adequate to establish and maintain visibility of the indirect cost.

Proper identification of unallowable indirect costs is essential to assure proper treatment in indirect cost rate analysis:

- Unallowable costs must be removed from any indirect cost pool estimate, because Government contracts cannot include unallowable costs. In evaluating the reasonableness of the contractor's adjustment you should compare the proposed unallowable adjustment to the historical adjustments, preferably as adjusted by audit.

- When allocation base estimates include unallowable costs, the unallowable costs must be considered in Government rate projections to assure proper allocation of costs across all cost objectives.

Consider the following tests for cost allowability identified in the following table as you perform your analysis (FAR 31.201-2):

<table>
<thead>
<tr>
<th>Points to Consider When Analyzing Indirect Cost Allowability</th>
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<tbody>
<tr>
<td>If:</td>
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<tr>
<td>Then:</td>
</tr>
<tr>
<td>The proposed indirect cost pool</td>
</tr>
<tr>
<td>Dollar amount is not reasonable</td>
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<td>--------------------------------</td>
</tr>
<tr>
<td>The proposed cost should have been treated as a direct cost (either against the proposed contract or another contract)</td>
</tr>
<tr>
<td>The cost belongs in a different indirect cost pool.</td>
</tr>
<tr>
<td>The same cost is also represented in another indirect pool, as a direct cost, or as part of an estimating factor (e.g., a packaging or obsolescence factor)</td>
</tr>
<tr>
<td>The proposed cost is not properly allocable, in part or in whole, to the pool under CAS or GAAP</td>
</tr>
<tr>
<td>The proposed cost is not allowable, in part or in whole, under the FAR cost principles</td>
</tr>
<tr>
<td>The proposed cost is not allowable, in whole or in part, under the terms and conditions of the contract</td>
</tr>
</tbody>
</table>
The Applied Overhead line represents the negotiated indirect cost forward pricing rate (300% of direct labor dollars). The Budget Estimate line represents the firm's forecast of the pool at different levels of production. Note the following characteristics of the two lines:

- The Applied Overhead line passes through the origin, because indirect costs can only be charged if product is produced and sold. (300% of nothing equals nothing.)
- The Budget Estimate line has a positive intercept at $10 million. In other words, Manufacturing Overhead includes $10 million in fixed costs.
- The two lines intersect at the direct labor estimate of $10,000,000 for the year—the point at which a 300% rate would recover the budgeted $30,000,000 in indirect costs.

However, if the base is anything other than $10 million, use of the 300 percent rate will not equal the budgeted indirect cost.

If the base were actually $5 million at the end of the period, the actual indirect cost should be $20 million (according to budget estimates). If indirect costs for all contracts had been estimated using the 300 percent rate, only $15 million would be applied (charged) to the contracts. Indirect cost would be **under-applied** by $5 million ($20 million - $15 million). If the contracts were all firm fixed-price, that $5 million would come out of the contractor’s profits.

If the base were actually $15 million at the end of the period, the actual indirect cost should be $40 million (according to budget estimates). If indirect costs for all contracts had been estimated using the 300 percent rate, $45 million would be applied to the contracts. Indirect cost would be **over-applied** by $5 million ($45 million - $40 million). If the contracts were all firm fixed-price, the result would be $5 million in additional profit.

When a contract is performed over several accounting periods, analyze the indirect cost allocation base for each rate for each accounting period covered by the contract. Consider questions such as the following as you conduct your analysis (FAR 31.203(e) and App B, 9904.406-40):

- Did the offeror use the correct base period (e.g., one year)?

The base period for allocating indirect costs is the cost accounting period during which such costs are incurred and accumulated for distribution to work performed during that period. Generally the base period is the contractor’s fiscal year. A shorter period may be appropriate:

- For contracts in which performance involves only a minor portion of the fiscal year,
- When it is general practice in the industry to use a shorter period, or
- During a transitional cost accounting period as part of a change in fiscal year.
• Does the indirect cost allocation base include all costs associated with that base during the accounting period, whether allowable or not?

Remember that unallowable costs must be excluded from any proposed indirect cost pool. However, all costs must be included in the base -- even the unallowable costs. For example, unallowable costs must be excluded from a manufacturing overhead pool. However, if manufacturing overhead is part of the allocation base for another indirect cost account (e.g., G&A expense) the unallowable costs must be added back into the base.

• Will the base result in a fair allocation of the costs in the indirect cost pool?

Indirect costs must be accumulated by logical cost groupings with due consideration of the reasons for incurring such costs. The base should be selected so as to permit allocation of the grouping on the basis of benefits accruing to the several cost objectives. For example, if the pool is largely labor related (such as fringe benefits), the base should be a measure of labor effort, such as direct labor hours or dollars. If the pool is largely machinery related (such as depreciation and maintenance), the base should relate to machinery use, such as direct machine hours.

• When was the base estimate made?

If the offeror is estimating a base for the fiscal year, an estimate made mid-way through the fiscal year is likely to be more accurate than an estimate made at the beginning of the year. Likewise, an estimate made for the next fiscal year should normally be more reliable than an estimate for a period three years in the future.

• Does the sales volume used to estimate the allocation base appear reasonable?

The offeror does not have perfect knowledge of what is going to happen in the future.

• Estimators must consider more than known sales volume for the period in estimate development. Typically, the offeror will consider the following business forecast elements:
  • Contracts in hand;
  • Options that may be exercised;
  • Proposals with a high probability of success (e.g., final proposal revisions);
  • Solicitations in hand; and
  • Sales forecasts of future customer requirements;

• Each element of the sales volume forecast should be assigned a probability of actual sale. Contracts in hand would be 100 percent. Other estimates would be assigned a lower "win" probability, based on an analysis of the probability of actually making the sale.

• If the firm's sales consist of only a few large Government contracts, place less faith in contractor statistical estimates, and more faith on the best expressions of Government plans. When the total business activity of the firm includes a large number of relatively small orders, give greater credence to statistical projections that appear reasonable, given the available data.

• Does the allocation base estimate appear reasonable for the projected sales volume?

Using historical data and other available information, determine if the proposed allocation base appears reasonable for the estimated sales volume. If you have any questions, seek information from the cognizant auditor or ACO.

• How stable has the allocation base been over time?

Particularly with respect to small businesses that are heavily dependent on a few contracts, the base may be quite unstable. If such a firm loses only one contract, indirect rates on its remaining contracts might skyrocket. That would be particularly significant for proposed cost-reimbursement contracts. You may need to consider contract terms to protect the Government from the risk of unexpected, substantial changes in burden rates.

Convert the Base and Pool to Constant-Year Dollars. To analyze the historical relationship between the indirect cost allocation base and the indirect cost pool, you need to consider the changing value of the dollar. Unfortunately, it may be impossible for you to adjust for inflation when you are performing a
summary level analysis, because there is rarely a single price index that you can use to adjust an entire indirect cost pool for inflation/deflation. There are typically too many different types of cost and cost behaviors included in indirect cost pools. For example, during a period of general inflation, depreciation will decline unless the contractor acquires new depreciable assets. The price of gasoline for company cars may rise rapidly as the cost of office supplies is declining.

On the other hand, if you are performing a detailed analysis of individual elements of an indirect cost account, you should be able to identify one or more indexes to use in adjusting for the changing value of the dollar. If the contractor has adjusted costs for inflation and the contractor's index number selection is reasonable, use it. If you have any concerns about the contractor's adjustments for inflation, deal with them before proceeding with further analysis.

For example: The following actual costs for 19[20]X3, 19[20]X4, and 19[20]X5 along with projected costs for 19[20]X6 were taken from a contractor's proposal for an indirect pool: [A10]

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pool</td>
<td>$2,502,490</td>
<td>$2,768,851</td>
<td>$3,110,004</td>
<td>$3,510,141</td>
</tr>
<tr>
<td>Base</td>
<td>$1,154,650</td>
<td>$1,270,115</td>
<td>$1,397,115</td>
<td>$1,536,839</td>
</tr>
<tr>
<td>Rate</td>
<td>216.7%</td>
<td>218.0%</td>
<td>222.6%</td>
<td>228.4%</td>
</tr>
</tbody>
</table>

The following graph depicts the data presented in the above table. The solid lines depict independently the base and pool in current-year (unadjusted for inflation) dollars. The dotted lines depict the same information in constant-year (19[20]X3) dollars.[A11]
Both the table and the graph show fluctuating base and pool dollars. However, inflation-adjusted data indicate that the inflation-adjusted indirect cost pool is increasing, while the inflation-adjusted allocation base is remaining relatively constant. Based on this analysis, it appears that inflation is masking real substantial growth in the rate.

**Analyze the Pool/Base Relationship.** Both the allocation base and indirect costs will normally change with increases or decreases in business activity. If you can determine the historic relationship between the allocation base and indirect costs, you can predict what the rate will be at various levels of the allocation base.

If you can use regression analysis to quantify the relationship, you will be able to easily predict the indirect cost pool for any allocation base value.

You can analyze the overall relationship between the allocation base and the indirect cost pool, or examine the relationship between individual indirect cost accounts (e.g., office supplies) and the indirect cost allocation base. The following graph demonstrates application of this technique to the data on constant year dollars from the example on the previous page.[A12]


As you review the above graph, note that the proposed rate for 19X6 falls well above the value that you would project based on the historical base/pool relationship. When the contractor's estimate is substantially above or below the line, you should challenge the estimate. If the contractor refuses to change its rate but cannot explain the reasons for the difference, consider performing a more in-depth analysis.

As you examine the base/pool relationship, ask questions such as the following:

- Has the composition of the pool or base changed over time?

Be alert to any changes in the composition of either the base or pool. The offeror may have automated. Automation would increase depreciation expense in the indirect cost pool while decreasing any base related to direct labor. Indirect cost rates could increase while combined direct and indirect costs decline.

- Has the indirect cost rate structure changed from the structure used for past contracts?

A change in rate structure could result in costs being moved from one indirect cost pool to another. If your analysis indicates that changes have taken place ask the offeror for more information on the changes.
• Are changes in the rate consistent with the mix of fixed and variable costs in the indirect cost pool?

If the indirect cost pool is primarily composed of variable costs, the rate should be relatively insensitive to changes in the allocation base that result from changes in sales volume. If the indirect cost pool is primarily composed of fixed costs, the rate should be more sensitive to such changes.

Develop and Document Your Pricing Position. Develop and document your prenegotiation position, using the results of your analysis:

• If you accept the offeror's indirect cost rate estimate, document that acceptance.
• If you do not accept the indirect cost rate estimate, document your concerns with the estimate and develop your own prenegotiation position for costs covered by the estimate.
• If you can identify information that would permit you to perform a more accurate analysis of indirect cost rates, use the available information. Your analysis is not bound by the estimating methods used by the offeror.

9.5 Applying Forward Pricing Rates

Indirect Cost Rates and Forward Pricing. One important use for indirect cost rate estimates is contract forward pricing. Contract pricing estimates of indirect costs for specific contracts and contract line items are developed by applying the estimated rate to appropriate contract-related base. The indirect cost estimate will depend on both the rate and the size of the base related to contract performance.

Forward Pricing Rates (FAR 15.404-1(c), 15.404-2(a), and FAR 15.404-2(d)). An indirect cost forward pricing rate is a rate that is used in prospective contract pricing. Actually you may encounter several different forward pricing rates as you develop your pricing position.

• Proposed Forward Pricing Rates. These are the indirect cost pricing rates proposed by the contractor. Depending on the contractor's participation in negotiated Government contracts, the firm may prepare a separate rate proposal or include all data supporting the proposed rate as part of the contract pricing proposal. These rates are the starting point for indirect cost rate analysis and contract pricing.

• Audit Recommended Rates. These are rates developed by Government audit personnel as a result of their review of the contractor's indirect cost rate proposal. The recommendation may result from the audit of the current contract proposal, a recent (within the last 12 months) contract proposal, or a separate indirect cost rate proposal. These are important recommendations, because auditors are the only members of the Government Acquisition Team that have general access to the contractor's accounting records. However, they are recommendations. The contracting officer is still responsible for evaluating contract price reasonableness.

• Forward Pricing Rate Recommendations. Forward Pricing Rate Recommendations (FPRRs) are formal rate recommendations developed by the cognizant ACO for all Government buying activities. FPRRs are generally developed with assistance from the cognizant Government auditor.

When a contractor has a high volume of Government pricing actions, ACOs should consider establishing an FPRR:

• When the contractor refuses to submit a forward pricing rate agreement (FPRA) proposal or enter into and FPRA;
• During the period between cancellation of one FPRA and the establishment of a replacement FPRA; or
• During the period between agreement on an FPRA by Government/contractor negotiators and formal execution of the agreement.

Although FPRRs are only recommendations, you should not develop an independent position without first contacting the contract administration office that issued the FPRR. The contract administration office should be able to supply information supporting the reasonableness of the recommended rate. Consider inviting the ACO that issued the FPRR and cognizant auditor to attend negotiations concerning indirect cost rates.
• **Forward Pricing Rate Agreements (FAR 15.407-3).** Negotiating indirect rates tends to be time consuming and contentious. At contractor locations with significant Government business, the cognizant administrative contracting officer (ACO) should attempt to negotiate an FPRA.

  - An FPRA is a formal bilateral agreement that binds the contractor to propose the negotiated rates and the Government to accept them in pricing individual contracts. Each agreement includes provisions for canceling all or a portion of the agreement if circumstances change and the rate(s) are no longer valid representations of future costs.
  - Whenever an offeror is required to submit cost or pricing data, the offeror's proposal must:
    - Describe any FPRA rates used in the proposal; and
    - Identify the latest cost or pricing data already submitted in accordance with the agreement.
  - The ACO is responsible for monitoring the contractor’s rates. Therefore, you should direct any questions on FPRA status and acceptability to the ACO. Further, if you believe that the FPRA rates are unreasonable or that work to be performed on the proposed contract will significantly affect the rates, you should notify the ACO immediately and request a rate review.

*Rate Application.* Once you have determined the rate(s) that you will use in contract pricing, you must apply that rate as part of your cost analysis. Using the contractor proposed rates from Section 9.3, the following table presents a contract cost estimate for 19\[20\]X7:

<table>
<thead>
<tr>
<th>Contract Cost Estimate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Element</td>
<td>Proposed Cost</td>
</tr>
<tr>
<td>Material Dollars</td>
<td>$200,000</td>
</tr>
<tr>
<td>Material Overhead @ 9.6%</td>
<td>$19,200</td>
</tr>
<tr>
<td>Engineering Direct Labor</td>
<td>$5,000</td>
</tr>
<tr>
<td>Engineering Overhead @ 64.7%</td>
<td>$3,235</td>
</tr>
<tr>
<td>Manufacturing Direct Labor</td>
<td>$75,000</td>
</tr>
<tr>
<td>Manufacturing Overhead @ 250.8%</td>
<td>$188,100</td>
</tr>
<tr>
<td>Total Input Cost</td>
<td>$490,535</td>
</tr>
<tr>
<td>G&amp;A Expense @ 19.0%</td>
<td>$93,202</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$583,737</td>
</tr>
</tbody>
</table>

The following process was used to develop the contract cost estimate presented above using the proposed 19\[20\]X7 indirect cost rates:

- Estimate direct material and direct labor costs to perform the proposed contract, using appropriate estimating techniques.
- Multiply the proposed Material Dollar base by the Material Overhead Rate (9.6%), resulting in a contract Material Overhead estimate of $19,200.
- Multiply the proposed Engineering Labor Dollar base by the Engineering Overhead Rate (64.7%), resulting in a contract Manufacturing Overhead estimate of $3,235.
- Multiply the proposed Manufacturing Labor Dollar base by the Manufacturing Overhead Rate (250.8%), resulting in a contract Manufacturing Overhead estimate of $188,100.
- Total the proposed production input costs ($490,535).
- Multiply Total Cost Input by the proposed G&A Expense rate (19.0%), resulting in a contract G&A Expense estimate of $93,202.
- Add the estimated G&A Expense dollars to the Total Cost Input, resulting in a total proposed cost of $583,737.

**Caution** -- Assure that the Indirect Cost Rate Is Applied to the Appropriate Base

Apply each indirect cost rate to the appropriate allocation base. For example, if the direct labor costs from three departments - machining, fabricating, and assembly - are the base for the manufacturing overhead rate, you must multiply the sum total of all machining, fabricating, and assembly direct labor costs by the manufacturing overhead rate to estimate manufacturing overhead dollars. On the other hand, do not apply the manufacturing overhead rate to cost categories not included in the base. You would not apply manufacturing overhead to field service labor cost if field service labor costs were not part of the allocation base used in developing the rate. **Only apply overhead rates to those elements included in the appropriate indirect cost allocation base.**

**Sources of Estimate Differences.** Differences between the contractor's estimate of indirect costs and your estimate can come from two sources - rate differences and proposed contract allocation base differences. You need to be aware of the sources of cost differences as you prepare for contract negotiations. Remember that even if you accept the contractor's proposed rate, your indirect cost objective will be lower than the costs proposed, if the base you are using is lower than the contractor's proposed base.

- **10.0 - Chapter Introduction**
- **10.1 - Recognizing Elements Affecting Facilities Capital Cost Of Money**
- **10.2 - Identifying And Applying Facilities Capital Cost Of Money Factors**
  - 10.2.1 - Calculating Contract Facilities Capital Cost Of Money
  - 10.2.2 - Using The DD Form 1861

**10.0 Chapter Introduction**

This chapter identifies points to consider as you develop your prenegotiation position on facilities capital cost of money.

**10.1 Recognizing Elements Affecting Facilities Capital Cost Of Money**

*Facilities Capital Cost of Money (FAR 31.205-10(a), Appendix B, 9904.414-30, and Appendix B, 9904.417-50).*

Facilities capital cost of money is an imputed cost related to the cost of contractor capital committed to facilities. **CAS 414, Cost of Money as an Element of the Cost of Facilities Capital, provides detailed guidance on calculating the amount of facilities capital cost of money due under a specific contract. Under CAS 414, a business-unit's facilities capital cost of money is calculated by multiplying the net book value of the business-unit's facilities investment by a cost of money rate based on the interest rates specified semi-annually by the Secretary of the Treasury under Public Law 92-41. The business-unit's facilities capital cost of money is then broken down by overhead pool and allocated to specific contracts using the same allocation base used to allocate the indirect costs in the overhead pool.** Facilities capital cost of money is determined without regard to whether the source is owner's equity or borrowed capital. It is not a form of interest on borrowing by the firm. Facilities capital cost of money allowed under CAS 414 does not duplicate or replace costs allowed under CAS 417, **Cost of Money as an Element of the Cost of Capital Assets Under Construction.** CAS 417 establishes criteria for the measurement of the cost of money attributable to capital assets under construction, fabrication, or development as an element of the cost of those assets. CAS 417 costs are only accumulated while assets are under construction, the costs are charged as part of contract depreciation over the depreciable life of the asset. As a result, analysis of CAS 417 costs becomes a part of the complex process of asset valuation and depreciation. If you have questions regarding CAS 417 costs, contact the cognizant Government auditor.
Purpose of Facilities Capital Cost of Money (FAR Appendix B, 9904.414-20). As contractor management considers investment opportunities, they must consider the cost of capital required to make each investment and the potential return from that investment. To attract investment, the prospective return on investment generally must be higher than the cost of capital required to make the investment. Thus, the cost of capital is a real cost that affects investment decisions. Unfortunately, the cost of capital is not the same for all sources (e.g., owner's equity and long-term loans), all firms, or all periods of time. The purpose of facilities capital cost of money criteria is to improve contractor cost measurement by providing for allocation of the cost of contractor investment in facilities to negotiated contracts. To assure uniform consideration, the criteria require use of the current Treasury-determined cost of money rate for all firms and all facility investments.

Facilities Capital Cost of Money Allowability (FAR 31.205-10(a) and FAR 31.205-52). Whether or not the contract is otherwise subject to Cost Accounting Standards, facilities capital cost of money is allowable when all of the following requirements are met:

- The contractor's capital investment is measured, allocated to contracts, and costed in accordance with CAS 414.
- The contractor maintains adequate records to demonstrate compliance with the requirements of CAS 414.
- The estimated facilities capital cost of money is specifically identified or proposed in cost proposals relating to the contract under which the cost is to be claimed.
- The requirements in FAR 31.205-52, Asset Valuations Resulting from Business Combinations, are not exceeded.

Contractor Waiver of Facilities Capital Cost of Money (FAR 15.404-4(c)(3), FAR 15.408(i), and FAR 52.215-17). If the prospective contractor fails to identify or propose facilities capital cost of money in a proposal for a contract that will be subject to the FAR cost principles for contracts with commercial organizations, facilities capital cost of money will not be an allowable cost in any resulting contract. Under those circumstances, the contract must include the FAR clause, Waiver of Facilities Capital Cost of Money.

Facilities Capital Cost of Money Cannot Be Used as a Profit Base (FAR 15.404-4(c)(3) and DFARS 215.404-71-4). FAR requires that you use your prenegotiation cost objective as the basis for calculating the prenegotiation objective for profit or fee. However, FAR also requires that you exclude any facilities cost of capital included in cost objectives before applying profit or fee factors. Even though FAR excludes facilities capital cost of money from the basis for calculating profit or fee objectives, your agency may provide for using the facilities capital cost of money to estimate the contractor facilities capital employed on the contract. The profit or fee objective may then consider the estimated facilities capital employed.

10.2 Identifying And Applying Facilities Capital Cost Of Money Factors
This section presents procedures for calculating and applying facilities capital cost of money factors and for using the DD Form 1861 (available in Adobe Acrobat (PDF) format).

- 10.2.1 - Calculating Contract Facilities Capital Cost Of Money
- 10.2.2 - Using The DD Form 1861

10.2.1 Calculating Contract Facilities Capital Cost Of Money
Developing Facilities Capital Cost of Money Rates (FAR Appendix B, 9904.414-60). The contractor is responsible for proposing facilities capital cost of money factors using the Form CASB-CMF. Accordingly, any review or analysis of cost of money factor development should examine the procedures used by the contractor in each step involved in completing the Form CASB-CMF.

<table>
<thead>
<tr>
<th>FORM</th>
<th>FACILITIES CAPITAL COST OF MONEY FACTORS COMPUTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS B-CMF</td>
<td></td>
</tr>
<tr>
<td>BUSINESS UNIT</td>
<td>ADDRESS:</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
</tr>
<tr>
<td>CONTRACTOR:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COST ACCOUNTING PERIOD:</th>
<th>1. APPLICABLE COST OF MONEY RATE <em>8</em>__%</th>
<th>2. ACCUMULATION &amp; DIRECT DISTRIBUTION OF N.B.V.</th>
<th>3. ALLOCATION OF UNDISTRIIBUTED</th>
<th>4. TOTAL NET BOOK VALUE</th>
<th>5. COST OF MONEY FOR THE COST ACCOUNTING PERIOD</th>
<th>6. ALLOCATION BASE FOR THE PERIOD</th>
<th>7. FACILITIES CAPITAL COST OF MONEY FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BUSINESS UNIT</td>
<td>RECORDED</td>
<td>$1,052,500</td>
<td>BASIS OF ALLOCATION</td>
<td>COLUMNS 2+3</td>
<td>COLUMNS 1x4</td>
<td>IN UNIT(S) OF MEASURE</td>
<td>COLUMNS 5/6</td>
</tr>
<tr>
<td>2. LEASED PROPERTY</td>
<td></td>
<td>$90,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. CORPORATE OR GROUP</td>
<td></td>
<td>$62,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. TOTAL</td>
<td></td>
<td>$1,204,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. UNDISTRIIBUTED</td>
<td></td>
<td>$1,052,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. DISTRIBUTED</td>
<td></td>
<td>$152,500</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVERHEAD POOLS</th>
<th>MATERIAL</th>
<th>ENGINEERING</th>
<th>MANUFACTURING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$20,000</td>
<td>$20,000</td>
<td>$112,500</td>
</tr>
<tr>
<td></td>
<td>$40,000</td>
<td>$100,000</td>
<td>$850,000</td>
</tr>
<tr>
<td></td>
<td>$60,000</td>
<td>$120,000</td>
<td>$962,500</td>
</tr>
<tr>
<td></td>
<td>$4,800</td>
<td>$9,600</td>
<td>$77,000</td>
</tr>
<tr>
<td></td>
<td>$960,000</td>
<td>$640,000</td>
<td>$700,000</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>
For each accounting period, the factor-development process follows a 7-step procedure:

1) **Determine the appropriate cost of money rate.** The contractor must use the current cost of money rate as determined by the Secretary of the Treasury, under P.L. 92-41. The rate is published twice a year in the Federal Register. (Column 1)

2) **Accumulate net book value of business-unit facilities capital.** For each accounting period, this accumulation must include the net book value of facilities owned by the business unit, the capitalized value of facilities capital-lease items, and the business-unit's allocated share of corporate or group facilities. This figure will normally change from period to period. (Business Unit Facilities Capital -- Column 2)

3) **Allocate facilities capital net book value to indirect cost pools.** Business-unit facilities capital is assigned to accounts for allocation to contracts. These accounts will be related to the contractor's overhead pools. If depreciation for a building is part of the engineering overhead pool, the facilities capital would be assigned to a facilities capital pool identified as engineering overhead. (Column 2 and Column 3)

4) **Sum facilities capital net book value for each pool.** The facilities capital net book values assigned to each pool must be summed to determine the total pool value. (Column 2 + Column 3 = Column 4)

5) **Calculate the facilities capital cost of money for each pool.** To calculate the facilities capital cost of money for each pool, multiply each facilities capital pool by the current cost of money rate. (Column 4 x Column 1 = Column 5)

6) **Identify the appropriate allocation base for each facilities capital cost of money pool.** The allocation base used to allocate a facilities capital cost of money pool will be the same as the base used to allocate the related indirect cost pool. Depending on the method used to estimate costs, the base estimate will normally change from period to period. (Column 6)

7) **Calculate facility cost of money factors.** Divide each facilities capital cost of money pool by the appropriate allocation base. CAS 414 requires that the calculation be taken to five decimal places. (Column 5/Column 6 = Column 7)

**Government Facilities Cost of Capital Factor Analysis (FAR 15.402(a), FAR 15.404-2(a), and DFARS 230.7004-1).**

Because facilities capital cost of money factors affect contracts across the business unit, support from the cognizant auditor and administrative contracting officer (when one is assigned) can be particularly important to your analysis. When indirect cost rates are audited by cognizant Government auditors, facilities capital cost of money factors are typically audited at the same time. ACOs may negotiate forward pricing facilities capital cost of money factors at the same time that they negotiate forward pricing indirect cost rates. However, remember that the contracting officer still has ultimate responsibility for determining
contract price reasonableness. Applying Factors to Appropriate Bases. To be considered for facilities capital cost of money, the offeror must include it in the firm’s cost proposal. The calculations are normally found at the end of the proposed cost breakdown, after profit. The table below demonstrates how facilities capital cost of money would be calculated for work performed during each contract accounting period. Note that each facilities capital cost of money factor is applied to the same base (cost element names in bold font) as the related indirect cost rate.

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Rate/Factor and Base</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td></td>
<td>$90,000</td>
</tr>
<tr>
<td>Material Overhead</td>
<td>5.0% of Direct Material Cost</td>
<td>$4,500</td>
</tr>
<tr>
<td>Direct Engineering Labor</td>
<td></td>
<td>$74,000</td>
</tr>
<tr>
<td>Engineering Overhead</td>
<td>50.0% of Direct Engineering Labor Cost</td>
<td>$37,000</td>
</tr>
<tr>
<td>Direct Manufacturing Labor</td>
<td></td>
<td>$150,000</td>
</tr>
<tr>
<td>Manufacturing Overhead</td>
<td>215.0% of Direct Manufacturing Labor Cost</td>
<td>$322,500</td>
</tr>
<tr>
<td>Other Direct Cost</td>
<td></td>
<td>$22,000</td>
</tr>
<tr>
<td>Total Manufacturing Cost</td>
<td></td>
<td>$700,000</td>
</tr>
<tr>
<td>G&amp;A Expense</td>
<td>6.0% of Total Manufacturing Cost</td>
<td>$42,000</td>
</tr>
<tr>
<td>Total Cost Less Cost of Money</td>
<td></td>
<td>$742,000</td>
</tr>
<tr>
<td>Profit</td>
<td>20.0% of Total Manufacturing Cost</td>
<td>$140,000</td>
</tr>
<tr>
<td>Total Price Less Cost of Money</td>
<td></td>
<td>$882,000</td>
</tr>
<tr>
<td>Facilities Capital Cost of Money</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>.00500 x Direct Material Cost</td>
<td>$450</td>
</tr>
<tr>
<td>Engineering</td>
<td>.01500 x Direct Engineering Labor Cost</td>
<td>$1,110</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>.11000 x Direct Manufacturing Labor Cost</td>
<td>$16,500</td>
</tr>
<tr>
<td>G&amp;A</td>
<td>.00124 x Total Manufacturing Cost</td>
<td>$868</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$18,928</td>
</tr>
<tr>
<td>Total Price</td>
<td></td>
<td>$900,928</td>
</tr>
</tbody>
</table>

10.2.2 Using The DD Form 1861

DD Form 1861 Uses (DFARS 230.7001-1). The DoD has created the DD Form 1861, Contract Facilities
Capital Cost of Money, to provide a uniform format for calculating and documenting the contract facilities capital cost of money and the contractor facilities capital employed on a contract. In the DoD, the contractor's facilities capital employed is used to measure contractor facilities investment for consideration in profit/fee analysis.

**Calculating Contract Facilities Capital Cost of Money (DFARS 230.7001-2 and NFS 1830.7001-1).**

If you are assigned to a DoD organization, use the DD Form 1861 (or an electronic version of the form) to calculate the contract facilities capital cost of money. If you are assigned to another agency, your agency may permit or direct you to use of the DD Form 1861.

The following figure demonstrates the use of a DD Form 1861 to document the facilities capital cost of money calculations from the example in the previous section.

<table>
<thead>
<tr>
<th>CONTRACT FACILITIES CAPITAL COST OF MONEY</th>
<th>Form Approved OMB No. 0704-0267 Expires Mar 31, 1998</th>
</tr>
</thead>
</table>

Public reporting burden for this collection of information is estimated to average 10 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0267), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSES.

<table>
<thead>
<tr>
<th>RETURN COMPLETED FORM TO YOUR CONTRACTING OFFICIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CONTRACTOR NAME</td>
</tr>
<tr>
<td>3. BUSINESS UNIT</td>
</tr>
<tr>
<td>4. RFP/CONTRACT PIIN NUMBER</td>
</tr>
<tr>
<td>6. DISTRIBUTION OF FACILITIES CAPITAL COST OF MONEY</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POOL</th>
<th>ALLOCATION BASE</th>
<th>FACILITIES CAPITAL COST OF MONEY c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Material</td>
<td>$90,000</td>
<td>.00500</td>
</tr>
<tr>
<td>a. Engineering</td>
<td>$74,000</td>
<td>.01500</td>
</tr>
<tr>
<td>a. Manufacturing</td>
<td>$150,000</td>
<td>.11000</td>
</tr>
<tr>
<td>a. G&amp;A</td>
<td>$700,000</td>
<td>.00124</td>
</tr>
</tbody>
</table>
As you look at the form, note that Section 6 of the form is divided into four columns: pool, allocation base, factor, and amount. The four columns correspond to information that you will need to calculate your cost of money objective.

- **Pool.** The pool column is used to identify the name of each pool. Identifying the pool by name facilitates calculations by assuring that all appropriate pools are considered and the appropriate factor is used in making each calculation.

- **Allocation Base.** The allocation base is the base value for the accounting period from your pricing position. If you have more than one negotiation position - such as a minimum, a maximum, and an objective - you would have a different form for each position and each accounting period.

- **Factor.** In this column, use the Government objective for the appropriate cost of money factor for the accounting period. If there is a forward pricing rate agreement, use the agreed-to rate. If there is disagreement over the appropriate rate, use a reasonable rate based on the available information.

- **Amount.** The amount is the cost of money for each pool computed by multiplying the amount in the allocation base column by the amount in the factor column.

After all factors are applied to the appropriate bases, the amounts are totaled to determine the total facilities capital cost of money applicable to that accounting period.

**Calculating Contract Facilities Capital Employed.** In the DoD, the DD Form 1861 is also used to calculate facilities capital employed. This serves as an estimate of the contractor facility investment required to complete the contract effort performed during the accounting period.

Remember that the total business-unit facilities capital cost of money for each pool is calculated by multiplying the net book value of facilities capital by the current Treasury-determined cost of money rate. To calculate the facilities capital employed on the contract during each accounting period, you reverse the process -- divide the contract facilities cost of capital for the accounting period by the current cost of money rate.

The figure below demonstrates the facilities capital employed calculation using the facilities capital cost of money calculations from the figure above and an 8.0 percent cost of money rate:
Public reporting burden for this collection of information is estimated to average 10 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0267), Washington, DC 20503.

Please do not return your completed form to either of these addresses.

RETURN COMPLETED FORM TO YOUR CONTRACTING OFFICIAL

<table>
<thead>
<tr>
<th>1. CONTRACTOR NAME</th>
<th>2. CONTRACTOR ADDRESS</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. BUSINESS UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. RFP/CONTRACT PIIN NUMBER</th>
<th>5. PERFORMANCE PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<thead>
<tr>
<th>6. DISTRIBUTION OF FACILITIES CAPITAL COST OF MONEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>POOL</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>a.</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Manufacturing</td>
</tr>
<tr>
<td>G&amp;A</td>
</tr>
<tr>
<td>d. TOTAL</td>
</tr>
<tr>
<td>e. TREASURY RATE</td>
</tr>
<tr>
<td>f. FACILITIES CAPITAL EMPLOYED (TOTAL DIVIDED BY TREASURY RATE)</td>
</tr>
</tbody>
</table>
Distributing Facilities Capital Employed (DFARS 215.404-71-4). To encourage contractor investment in productive facilities, the DoD weighted guidelines method of profit/fee analysis provides a profit objective for equipment, but does not provide for any profit objective for land and buildings. To facilitate profit/fee calculations, one more series of calculations is required before the facilities capital employed can be used in DoD weighted guidelines.

Distributing Facilities Capital Employed (cont) DD Form 1861, Section 7 is used to estimate the amount of each type of facility employed on the contract. The percentage assigned to each type of facility in Section 7 is equal to the overall percentage of contractor net book value invested in that type of facility. Percentages are proposed by the contractor and subject to Government review. Of course, the sum of all percentages must equal 100 percent.

To estimate the value of each type of facility employed on the contract, multiply the total facilities capital employed by the appropriate percentage. The result is the estimated amount of that type of facility employed on the contract during the accounting period. The sum of all three amounts must equal the total facilities capital employed during the accounting period. Some adjustment may be required to compensate for rounding error in the various calculations.

The figure below demonstrates distribution of the facilities capital employed assuming that overall contractor facilities capital is 20 percent land, 50 percent buildings, and 30 percent equipment:

<table>
<thead>
<tr>
<th>FACILITIES CAPITAL EMPLOYED</th>
<th>PERCENTAGE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAND</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>BUILDINGS</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>EQUIPMENT</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>FACILITIES CAPITAL EMPLOYED</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

DD Form 1861, APR 95 PREVIOUS EDITIONS MAY BE USED

Public reporting burden for this collection of information is estimated to average 10 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0267), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSES.
## 6. DISTRIBUTION OF FACILITIES CAPITAL COST OF MONEY

<table>
<thead>
<tr>
<th>POOL</th>
<th>ALLOCATION BASE</th>
<th>FACILITIES CAPITAL COST OF MONEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Material</td>
<td>$90,000</td>
<td>.00500</td>
</tr>
<tr>
<td>b. Engineering</td>
<td>$74,000</td>
<td>.01500</td>
</tr>
<tr>
<td>c. Manufacturing</td>
<td>$150,000</td>
<td>.11000</td>
</tr>
<tr>
<td>d. G&amp;A</td>
<td>$700,000</td>
<td>.00124</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. TOTAL</td>
<td></td>
<td>$18,928</td>
</tr>
<tr>
<td>e. TREASURY RATE</td>
<td></td>
<td>8.0 %</td>
</tr>
<tr>
<td>f. FACILITIES CAPITAL EMPLOYED (TOTAL DIVIDED BY TREASURY RATE)</td>
<td></td>
<td>$236,600</td>
</tr>
</tbody>
</table>

## 7. DISTRIBUTION OF FACILITIES CAPITAL EMPLOYED

<table>
<thead>
<tr>
<th></th>
<th>PERCENTAGE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. LAND</td>
<td>20.0 %</td>
<td>$47,320</td>
</tr>
<tr>
<td>b. BUILDINGS</td>
<td>50.0 %</td>
<td>$118,300</td>
</tr>
<tr>
<td>c. EQUIPMENT</td>
<td>30.0 %</td>
<td>$70,980</td>
</tr>
<tr>
<td>d. FACILITIES CAPITAL EMPLOYED</td>
<td>100.0 %</td>
<td>$236,600</td>
</tr>
</tbody>
</table>

DD Form 1861, APR 95 PREVIOUS EDITIONS MAY BE USED

- 11.0 - [Chapter Introduction](#)
- 11.1 - [The Factors Affecting Profit/Fee Analysis](#)
  - 11.1.1 - [Identifying The Need For An Agency Structured Approach](#)
  - 11.1.2 - [Considering Contractor Profit Motivation](#)
11.0 Chapter Introduction

This chapter identifies points that you should consider as you analyze contract profit/fee.

Requirement for Profit/Fee Analysis (FAR 15.404-4(b)). Profit/fee is the dollar amount over and above allowable costs that is paid to the firm for contract performance. Most contract prices include either profit or fee, but contract profit/fee analysis is not required unless cost analysis is required to determine contract price reasonableness. When cost or pricing data are required, you must use profit/fee analysis to determine the reasonableness of any profit/fee included in the contract price. When cost information other than cost or pricing data are required, you may need to use profit/fee analysis to determine the reasonableness of any profit/fee included in the contract price.

Actual Profit/Fee May Vary (FAR 15.404-4(a)(1)). As you perform your profit/fee analysis, remember that (just as actual costs may vary from estimated costs) the contractor's actual realized profit/fee may vary from negotiated profit/fee, because of such factors as:

- Contract performance efficiency;
- Incurrence of unallowable costs; and
- Contract type.

11.1 Factors Affecting Profit/Fee Analysis

This section presents the general factors that you must consider when analyzing profit/fee as part of a contract cost analysis.

- 11.1.1 - Identifying The Need For An Agency Structured Approach
- 11.1.2 - Considering Contractor Profit Motivation
- 11.1.3 - Identifying Factors To Consider

11.1.1 Identifying The Need For An Agency Structured Approach

Each Agency Must Use a Structured Approach (FAR 15.404-4(b)). FAR only prescribes the factors that must be considered in establishing the profit/fee objective. It does not prescribe specific Government-wide procedures for profit/fee analysis.

Each agency making noncompetitive contract awards over $100,000 that total $50 million or more each year, must use a structured approach for determining the profit/fee prenegotiation objectives in those acquisitions that require cost analysis. An agency may develop its own structured approach, or use another agency's structured approach if that approach will meet its needs.

Exemptions May Be Authorized Where Approach Is Inappropriate (FAR 15.404-4(b) and 15.404-4(c)). Agencies may exempt certain types of contract actions from the application of the agency's structured approach to profit/fee analysis. However, even in situations exempted from application of your agency's structured approach, you must follow the general FAR requirements for profit/fee objective development. Examine your agency's guidelines to determine what specific exemptions apply.

11.1.2 Considering Contractor Profit Motivation

Underlying Assumption (FAR 15.404-4(a)). The underlying assumption behind Government structured approaches to profit/fee analysis is the belief that contractors are motivated by profit/fee. Structured approaches provide a discipline for ensuring that all relevant factors are considered in developing Government profit/fee negotiation objectives.

Profit/Fee Analysis Goals (FAR 15.404-4(a)(2)). It is in the Government's best interest to offer contractor's opportunities for financial rewards sufficient to:

- Stimulate efficient contract performance;
- Attract the best capabilities of qualified large and small business concerns to Government contracts; and
• Maintain a viable industrial base to meet public needs.

**Inconsistent Practices Regarding Profit/ Fee Reward** *(FAR 15.404-4(a)(3)).* If the Government is to use profit/fee to motivate contractor performance and achieve the above goals, practices primarily intended to reduce profit/fee or diminish the impact of profit/fee analysis are not in the Government's best interest. The following are practices that are inconsistent with Government profit/fee goals:

- Negotiations aimed at reducing prices by reducing profit/fee without proper consideration of the profit function.
- Negotiation of extremely low profits/fees.
- Use of historical average profit/fee rates without regard to the unique circumstances of the immediate negotiation.
- Automatically applying predetermined profit/fee percentages without regard to the unique circumstances of the immediate negotiation.

**Profit/Fee Ceiling** *(FAR 15.404-4(a)(3) and FAR 15.404-4(c)(4)).* Profit/fee calculations must consider the unique circumstances of the immediate negotiation. However, contract fee cannot exceed statutory limits that apply to cost-plus-fixed-fee contracts as identified in the following table:

<table>
<thead>
<tr>
<th>Type of Contract</th>
<th>Statutory Fee Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental, developmental, or research work performed under a cost-plus-fixed-fee contract</td>
<td>15% of estimated contract cost</td>
</tr>
<tr>
<td>All other cost-plus-fixed-fee contracts</td>
<td>10% of estimated contract cost</td>
</tr>
</tbody>
</table>

**11.1.3 Identifying Factors To Consider**

**Factors That Must Be Considered** *(FAR 15.404-4(d)).* While each agency is responsible for developing its own structured approach, the FAR stipulates factors that must be considered unless they are clearly inappropriate or not applicable.

<table>
<thead>
<tr>
<th>Profit/Fee Factor</th>
<th>Provide greater profit/fee opportunity to contractors who:</th>
<th>As you develop your profit/fee objective consider:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Effort (i.e. complexity of the work and resources required for contract performance)</td>
<td>Undertake contracts requiring a high degree of professional and managerial skill and whose skills, facilities, and technical assets can be expected to lead to efficient contract performance.</td>
<td>Material acquisition -- managerial and technical effort necessary to obtain materials, given the:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Complexity of items required;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Number of purchase orders/subcontracts awarded and administered;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Need for source development; and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Complexity of purchase orders/</td>
</tr>
<tr>
<td>Cost Risk</td>
<td>Assume a proportionately greater degree of cost responsibility and associated risk.</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Subcontracts.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conversion Direct Labor</strong></td>
<td>Contribution to contract performance, given the:  &lt;br&gt; - Diversity of labor types required; and  &lt;br&gt; - Amount and quality of supervision and coordination needed.</td>
<td></td>
</tr>
<tr>
<td><strong>Conversion-Related Indirect Cost</strong></td>
<td>Contribution to contract performance:  &lt;br&gt; - Give indirect labor the same profit/fee consideration as direct labor.  &lt;br&gt; - Evaluate other indirect costs on complexity and contribution to contract performance.</td>
<td></td>
</tr>
<tr>
<td><strong>General Management</strong></td>
<td>Composition and contribution to contract performance:  &lt;br&gt; - Give indirect labor the same profit/fee weight as comparable direct labor.  &lt;br&gt; - Evaluate management effort on complexity and involvement required.  &lt;br&gt; - Evaluate other cost elements on contribution to contract performance.</td>
<td></td>
</tr>
<tr>
<td><strong>Contractor cost responsibility</strong></td>
<td>Assume a proportionately greater degree of cost responsibility and associated risk as a result of:  &lt;br&gt; - Contract type; and  &lt;br&gt; - Reliability of the cost estimate in relation to the complexity and duration of the contract task.</td>
<td></td>
</tr>
</tbody>
</table>
| **Federal Socioeconomic Programs** | Have displayed unusual initiative in support of socioeconomic programs. | Contractor support of programs for:  
- Small businesses;  
- Small businesses owned and controlled by socially and economically disadvantaged individuals;  
- Woman-owned small businesses;  
- Handicapped sheltered workshops; and  
- Energy conservation. |
| **Capital Investments** | Have made investments that will facilitate efficient and economical contract performance. | Contractor investment amount; and  
- Effect of investment on efficient and economical contract performance. |
| **Cost Control and Other Past Accomplishments** | Have demonstrated an ability to perform similar tasks effectively and economically. | Contractor has:  
- Demonstrated ability to perform similar tasks effectively and economically;  
- Adopted measures to improve productivity; and  
- Other cost-reduction accomplishments that will benefit the Government in follow-on contracts. |
| **Independent Development** | Have undertaken relevant independent development without Government assistance. | Independent development efforts relevant to the contract end item; and  
- Contractor's direct or indirect cost recovery from the Government. |
| **Additional Factors** | Actively support agency program objectives. | Any additional factors prescribed by your agency for this purpose. |
Other Profit/Fee Considerations (FAR 15.404-4(c)). The factors identified above form the basis for agency structured approaches to profit/fee analysis. There are two other elements that you must consider when developing Government profit/fee objectives.

- **Eliminate Facilities Capital Cost of Money from the Profit/ Fee Base.** FAR requires that you base profit/fee prenegotiation objectives on the prenegotiation cost objectives. However, you must exclude any dollar amount for facilities cost of capital before applying profit/fee factors.

- **Consider Basic Contract Profit/Fee for Contract Modifications.** FAR requires that you consider profit/fee objectives based exclusively on the contract action being negotiated. The only exception is the negotiation of contract change or modification.
  
  o When you negotiate contract modifications, you may use the basic-contract profit/fee rate as your negotiation objective rate if both of the following conditions are met:
    
    ▪ The contract modification is for the **same type and mix of work** as the basic contract.
    ▪ The modification is of **relatively small dollar value** compared to the total contract.
  
  o If the contract modification does not meet both of the above conditions, perform a profit/fee analysis to establish the appropriate profit/fee objective.

11.2 Developing An Objective Using The DoD Weighted Guidelines

This section covers the DoD structured approach to profit/fee analysis -- the Weighted Guidelines.

- **11.2.1 - Applying The DoD Weighted Guidelines**
- **11.2.2 - Identifying Exempted Contract Actions**

11.2.1 Applying The DoD Weighted Guidelines

*Different Approaches for Different Products (DFARS 215.404-4(b), DFARS 215.404-71-2(c), and DFARS 215.404-71-4(c)).* DoD contracting officers must use the weighted guidelines method for profit/fee analysis unless use of the modified weighted guidelines method or an alternate structured method is appropriate. The weighted guidelines define a structure for profit/fee analysis that includes designated ranges for objective values as well as norm values that you may tailor to fit the circumstances of your specific acquisition.

Examining the Weighted Guidelines Form The **DD Form 1547** (available in Adobe Acrobat (PDF) format), Record of Weighted Guidelines Application, depicted below, provides the structure for DoD profit/fee analysis and reporting.

<table>
<thead>
<tr>
<th>RECORD OF WEIGHTED GUIDELINES APPLICATION</th>
<th>REPORT NO.</th>
<th>2. BASIC PROCUREMENT INSTRUMENT IDENTIFICATION NO.</th>
<th>3. DATE OF ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REPOR</strong></td>
<td><strong>CONTR</strong></td>
<td><strong>SYMBO</strong></td>
<td><strong>L DD-</strong></td>
</tr>
<tr>
<td><strong>OL</strong></td>
<td><strong>A&amp;T(Q)1</strong></td>
<td><strong>751</strong></td>
<td><strong>751</strong></td>
</tr>
<tr>
<td>a. PURCHASING OFFICE</td>
<td>b. FY</td>
<td>c. TYPE PROC INST CODE</td>
<td>d. PRISM</td>
</tr>
<tr>
<td>----------------------</td>
<td>------</td>
<td>------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>5. CONTRACTING OFFICE CODE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. NAME OF CONTRACTOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. DUNS NUMBER</td>
<td>8. FEDERAL SUPPLY CODE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. DOD CLAIMANT PROGRAM</td>
<td>10. CONTRACT TYPE CODE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. TYPE EFFORT</td>
<td>12. USE CODE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. MATERIAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. SUBCONTRACTS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. DIRECT LABOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. INDIRECT EXPENSES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. OTHER DIRECT CHARGES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. SUBTOTAL COSTS (13 thru 17)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. GENERAL AND ADMINISTRATIVE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. TOTAL COSTS (18+19)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEIGHTED GUIDELINES PROFIT FACTORS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>CONTRACTOR RISK FACTORS</td>
<td>ASSIGNED WEIGHTING</td>
<td>ASSIGNED VALUE BASE (ITEM 20)</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------</td>
<td>--------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>21.</td>
<td>TECHNICAL</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>MANAGEMENT/COST CONTROL</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>PERFORMANCE RISK (COMPOSITE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>CONTRACT TYPE RISK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>WORKING CAPITAL</td>
<td>Costs Financed</td>
<td>Length Factor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CONTRACTOR FACILITIES CAPITAL EMPLOYED</td>
<td>ASSIGNED VALUE AMOUNT EMPLOYED</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>LAND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>BUILDINGS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>EQUIPMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>COST EFFICIENCY FACTOR</td>
<td>ASSIGNED VALUE</td>
<td>BASE (Item 20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>TOTAL PROFIT OBJECTIVE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NEGOTIATED SUMMARY</th>
<th>PROPOSED</th>
<th>OBJECTIVE</th>
<th>NEGOTIATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>31. TOTAL COSTS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. FACILITIES CAPITAL COST OF MONEY <em>(DD FORM 1861)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. PROFIT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>TOTAL PRICE (Line 31 + 32 + 33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>35.</td>
<td>MARKUP RATE (Line 32 + 33 divided by 31)</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>CONTRACTING OFFICER APPROVAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>TYPED/PRINTED NAME OF CONTRACTING OFFICER <em>(Last, First, Middle Initial)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>SIGNATURE OF CONTRACTING OFFICER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>TELEPHONE NO.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>DATE SUBMITTED (YYY YMM DD)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DD FORM 1547, JUL 2002 PREVIOUS EDITION IS OBSOLETE.**

The DD Form 1547 provides an excellent guide for review of the DoD weighted guidelines approach to profit/fee analysis. For the review, we will divide the DD Form 1547 into the 10 parts identified in the table below:

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>DD Form 1547 Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acquisition Identification Information</td>
<td>1 - 12</td>
</tr>
<tr>
<td>2</td>
<td>Cost Objective by Cost Category</td>
<td>13 - 20</td>
</tr>
<tr>
<td>3</td>
<td>Performance Risk</td>
<td>21 - 23</td>
</tr>
<tr>
<td>4</td>
<td>Contract Type Risk</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Working Capital Adjustment</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Facilities Capital Employed</td>
<td>26 - 28</td>
</tr>
<tr>
<td>7</td>
<td>Cost Efficiency Factor</td>
<td>29</td>
</tr>
<tr>
<td>8</td>
<td>Total Profit/Fee Objective</td>
<td>30</td>
</tr>
<tr>
<td>9</td>
<td>Negotiation Summary</td>
<td>31 - 35</td>
</tr>
<tr>
<td>10</td>
<td>Contracting Officer Approval</td>
<td>36 - 39</td>
</tr>
</tbody>
</table>

* Acquisition Identification Information. Items 1-12 of the form define DoD requirements for basic acquisition information related to the profit/fee analysis including information about: the contractor, the contracting office, and the contract itself. The form requirements in this area are not considered in this chapter.*
Cost Objective by Cost Category. Items 13-20 of the form detail the Government's prenegotiation objectives (less any facilities capital cost of money) by cost category. This information serves as the base for several of the profit/fee calculations made during analysis.

- Be sure to exclude any facilities capital cost of money included in your cost objective from this portion of the DD Form 1547.
- Item 19 must include General and Administrative (G&A) expenses and all Independent Research and Development (IR&D)/Bid and Proposal (B&P) expenses.

The cost information in the table below is taken from the DD Form 1861 in Chapter 10.

<table>
<thead>
<tr>
<th>DD Form 1547 Item Numbers</th>
<th>Cost Category</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Material</td>
<td>$90,000</td>
</tr>
<tr>
<td>14</td>
<td>Subcontracts</td>
<td>-0-</td>
</tr>
<tr>
<td>15</td>
<td>Direct Labor</td>
<td>$224,000</td>
</tr>
<tr>
<td>16</td>
<td>Indirect Expenses</td>
<td>$364,000</td>
</tr>
<tr>
<td>17</td>
<td>Other Direct Charges</td>
<td>$22,000</td>
</tr>
<tr>
<td>18</td>
<td>Subtotal Costs (13 thru 17)</td>
<td>$700,000</td>
</tr>
<tr>
<td>19</td>
<td>General and Administrative</td>
<td>$42,000</td>
</tr>
<tr>
<td>20</td>
<td>Total Costs (18 + 19)</td>
<td>$742,000</td>
</tr>
</tbody>
</table>

Performance Risk Profit/Fee Analysis (DFARS 215.404-71-2). Items 21-23 of the form are designed to reward contractors who undertake contracts with more performance risk. To analyze performance risk, you must evaluate risk associated with fulfilling contract requirements. For profit/fee analysis, performance risk is subdivided into two types: technical and management/cost-control. The following table outlines factors that you should consider as you analyze each type of risk.

<table>
<thead>
<tr>
<th>Risk Type</th>
<th>Examples of Factors To Be Considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>• Technology being applied or developed by the contractor</td>
</tr>
<tr>
<td></td>
<td>• Technical complexity</td>
</tr>
<tr>
<td></td>
<td>• Program maturity</td>
</tr>
<tr>
<td></td>
<td>• Performance specifications and tolerances</td>
</tr>
<tr>
<td></td>
<td>• Delivery schedule</td>
</tr>
<tr>
<td></td>
<td>• Extent of warranty or guarantee</td>
</tr>
</tbody>
</table>
Management/Cost Control

- Contractor's management and internal control systems
- Management involvement expected under the contract
- Resources applied and value added by the contractor
- Contractor support for Federal socioeconomic programs
- Expected reliability of cost estimates
- Adequacy of management's approach to controlling cost and schedule
- Other factors affecting contractor's ability to meet cost targets

- **Performance Risk Importance Weight.** In the "Assigned Weighting" column of the DD Form 1547, weight the two elements of performance risk, considering each element's relative importance to proposed contract performance. The total of the weights must always equal 100 percent.

**Example 1:** For a development contract, you might assign the following weights:

<table>
<thead>
<tr>
<th>Element</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>65 %</td>
</tr>
<tr>
<td>Management/Cost Control</td>
<td>35 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100 %</strong></td>
</tr>
</tbody>
</table>

**Example 2:** For a production contract, you might assign the following weights:

<table>
<thead>
<tr>
<th>Element</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>20 %</td>
</tr>
<tr>
<td>Management/Cost Control</td>
<td>80 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100 %</strong></td>
</tr>
</tbody>
</table>

**Performance Risk Profit/Fee Value.** The column marked "Assigned Value" permits you to assign a profit/fee value based on the level of risk associated with the elements of performance risk. The range of values that you can assign depends on the acquisition situation.

- **Standard Value Range:** The standard designated range applies to most contracts and is used for both technical risk and management/cost control risk. The designated value range is 3% to 7% with a normal value of 5%. Evaluation criteria for technical risk appear in Table 11-1 below. Evaluation criteria for management/cost control risk appear in Table 11-3 below.

- **Technology Incentive Range:** Contracting officers may apply this range to the technical factor only when an acquisition includes development, production, or application of innovative new technologies. This range may not be used for acquisitions restricted to studies, analyses, or demonstrations that have a technical report as their primary deliverable. Evaluation criteria for the technology incentive range appear in Table 11-2 below.
<table>
<thead>
<tr>
<th>Consider .</th>
<th>When .</th>
</tr>
</thead>
</table>
| **Maximum Value** | • Contract effort requires development or initial production of a new item, particularly if performance or quality specifications are tight; or  
• Contract effort requires a high degree of development or production concurrency. | |
| **Significantly Above Normal Value** | • Contract effort involves extremely complex, vital efforts to overcome difficult technical obstacles which require personnel with exceptional abilities, experience, and professional credentials. | |
| **Above Normal Value** | • The contractor is either developing or applying advanced technologies;  
• Items are being manufactured using specifications with stringent tolerance limits;  
• Contract effort requires highly skilled personnel or the use of state-of-the-art machinery;  
• Services and analytical efforts are extremely important to the Government and must be performed to exacting standards;  
• The contractor's independent development and investment has reduced the Government's risk or cost;  
• The contractor has accepted and accelerated delivery schedule to meet DoD requirements; or  
• The contractor has assumed additional risk through warranty provisions. | |
| **Below Normal Value** | • Contract is for off-the-shelf items;  
• Requirements are relatively simple;  
• Technology is not complex;  
• Contract efforts do not require highly skilled personnel;  
• Contract efforts are routine;  
• Programs are mature; or  
• Contract is a follow-on effort or repetitive-type acquisition. | |
Significantly Below Normal Weight

- Contract is for routine services;
- Contract is for production of simple items;
- Contract is for rote entry of Government furnished information; or
- Contract is for simple operations with GFP.

Table 11-2. Assigning a Profit/Fee Value for Technical Risk Using the Technology Incentive Range

The contracting officer should use the technology incentive range only for the most innovative contract efforts.

Innovation may be in the form of . . .

- Development or application of new technology that fundamentally changes the characteristics of an existing product or system and that results in increased technical performance, improved reliability, or reduced costs; or
- New products or systems that contain significant technological advances over the products or systems they are replacing.

After deciding that use of the technology incentive range is appropriate, the contracting officer should consider the relative value of the proposed innovation to the acquisition as a whole. Generally use the normal value of 9%. However . . .

Consider using values less than the norm when:
The innovation represents a minor benefit.

Consider using values above the norm when:
The innovation will have a major positive impact on the product or program.

Table 11-3. Assigning a Profit/Fee Value for Management/Cost Control Risk

<table>
<thead>
<tr>
<th>Consider .</th>
<th>When .</th>
</tr>
</thead>
</table>
| **Maximum Weight** | • Contract effort requires large scale integration of the most complex nature;  
• Contract effort involves major international activities with significant management coordination (e.g., offsets with foreign vendors); or  
• Contract effort has critically important milestones. |
| **Above Normal Weight** | • The contractor's value-added is both considerable and reasonably difficult;  
• Contract effort involves a high degree of integration or coordination; |
<table>
<thead>
<tr>
<th>Below Normal Weight</th>
<th>Below Normal Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The contractor has a good record of past performance;</td>
<td>• The program is mature and many end item deliveries have been made;</td>
</tr>
<tr>
<td>• The contractor has a substantial record of active participation in Federal socioeconomic programs;</td>
<td>• The contractor adds minimum value to an item;</td>
</tr>
<tr>
<td>• The contractor provides fully documented and reliable cost estimates;</td>
<td>• Contract effort is routine and requires minimal supervision;</td>
</tr>
<tr>
<td>• The contractor makes appropriate make-or-buy decisions; or</td>
<td>• The contractor provides poor quality, untimely proposals;</td>
</tr>
<tr>
<td>• the contractor has a proven record of cost tracking and control.</td>
<td>• The contractor fails to provide an adequate analysis of subcontractor costs; or</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Significantly Below Normal Weight</th>
<th>Significantly Below Normal Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reviews performed by the field contract administration offices disclose unsatisfactory management and internal control systems (e.g., quality assurance, property control, safety, security); or</td>
<td>• Contract effort requires an unusually low degree of management involvement.</td>
</tr>
<tr>
<td>• The contractor has made minimal effort to initiate cost reduction programs;</td>
<td>• The contractor's cost proposal is inadequate;</td>
</tr>
<tr>
<td>• The contractor has a record of cost overruns or other indication of unreliable cost estimates and lack of cost control; or</td>
<td>• The contractor has a record of cost overruns or other indication of unreliable cost estimates and lack of cost control; or</td>
</tr>
<tr>
<td>• The contractor has a poor record of past performance.</td>
<td>• The contractor has a poor record of past performance.</td>
</tr>
</tbody>
</table>

**Calculate Composite Performance Risk Value.** The “Performance Risk (Composite) Assigned Value” (Item 23), is the weighted average -- calculated using the weight assigned and the value assigned to the two types of performance risk. For example, the following calculations depict weighted value calculation:
Weight | Assigned Value | Weighted Value
-------|---------------|---------------
Technical | 40% | 4.5% | 1.8%
Management/Cost Control | 60% | 4.0% | 2.4%
Composite Value | | | 4.2%

1. **Identify Performance Risk Profit/Fee Base.** Enter the value from Item 20 as the "Performance Risk (Composite) Base," Item 23. Remember that the value in Item 20 is the total contract cost excluding facilities capital cost of money.

2. **Calculate Performance Risk Profit/Fee Objective.** To calculate the "Performance Risk (Composite) Profit Objective," Item 23, multiply the "Performance Risk (Composite) Assigned Value," by the "Performance Risk (Composite) Base" as shown in the example below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Contractor Risk Factors</th>
<th>Assigned Weighing</th>
<th>Assigned Value</th>
<th>Base (Item 20)</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>Technical</td>
<td>40%</td>
<td>4.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Management/Cost Control</td>
<td>60%</td>
<td>4.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Performance Risk (Composite)</td>
<td>4.2%</td>
<td>$742,000</td>
<td>$31,164</td>
<td></td>
</tr>
</tbody>
</table>

*Contract-Type Risk Profit/Fee Analysis (DFARS 215.404-71-3).* Item 24 of the form focuses on the degree of cost risk accepted by the contractor under various types of contracts.

3. **Select the Appropriate Profit/Fee Range.** The designated profit/fee ranges and the normal values for major contract types are described in the following table:

<table>
<thead>
<tr>
<th>Profit/Fee Values for Contract-Type Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Type</td>
</tr>
<tr>
<td>Note</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Firm Fixed-Price</td>
</tr>
<tr>
<td>No Financing</td>
</tr>
<tr>
<td>With Performance-Based Payments</td>
</tr>
<tr>
<td>With Progress Payments</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(6)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>Fixed-Price Incentive</td>
</tr>
<tr>
<td>No Financing</td>
</tr>
<tr>
<td>With Performance-Based Payments</td>
</tr>
<tr>
<td>With Financing</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(6)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
</tbody>
</table>

1. **Identify Performance Risk Profit/Fee Base.** Enter the value from Item 20 as the "Performance Risk (Composite) Base," Item 23. Remember that the value in Item 20 is the total contract cost excluding facilities capital cost of money.

2. **Calculate Performance Risk Profit/Fee Objective.** To calculate the "Performance Risk (Composite) Profit Objective," Item 23, multiply the "Performance Risk (Composite) Assigned Value," by the "Performance Risk (Composite) Base" as shown in the example below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Contractor Risk Factors</th>
<th>Assigned Weighing</th>
<th>Assigned Value</th>
<th>Base (Item 20)</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>Technical</td>
<td>40%</td>
<td>4.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Management/Cost Control</td>
<td>60%</td>
<td>4.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Performance Risk (Composite)</td>
<td>4.2%</td>
<td>$742,000</td>
<td>$31,164</td>
<td></td>
</tr>
</tbody>
</table>

*Contract-Type Risk Profit/Fee Analysis (DFARS 215.404-71-3).* Item 24 of the form focuses on the degree of cost risk accepted by the contractor under various types of contracts.

3. **Select the Appropriate Profit/Fee Range.** The designated profit/fee ranges and the normal values for major contract types are described in the following table:

<table>
<thead>
<tr>
<th>Profit/Fee Values for Contract-Type Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Type</td>
</tr>
<tr>
<td>Note</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Firm Fixed-Price</td>
</tr>
<tr>
<td>No Financing</td>
</tr>
<tr>
<td>With Performance-Based Payments</td>
</tr>
<tr>
<td>With Progress Payments</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(6)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>Fixed-Price Incentive</td>
</tr>
<tr>
<td>No Financing</td>
</tr>
<tr>
<td>With Performance-Based Payments</td>
</tr>
<tr>
<td>With Financing</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(6)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>Contract Type</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Fixed-Price Redeterminable</td>
</tr>
<tr>
<td>No Financing</td>
</tr>
<tr>
<td>With Financing</td>
</tr>
<tr>
<td>Cost-Plus-Incentive-Fee</td>
</tr>
<tr>
<td>Cost-Plus-Fixed-Fee</td>
</tr>
<tr>
<td>Time and Material</td>
</tr>
<tr>
<td>Labor-Hour</td>
</tr>
<tr>
<td>Firm fixed-price-level-of-effort-term</td>
</tr>
</tbody>
</table>

(1) "No Financing" means either that the contract does not provide progress payments or performance-based payments or provides them only on a limited basis (e.g., financing of first articles). Do not compute a working capital adjustment in Item 25.
(2) When the contract contains provisions for progress payments, compute a working capital adjustment in Item 25.
(3) For the purpose of assigning profit values, treat a fixed-price contract with redeterminable provisions as if it were a fixed-price-incentive contract with below normal conditions.
(4) Cost-reimbursement contracts shall not receive the working capital adjustment.
(5) These types of contracts are considered cost-plus-fixed-fee contracts for the purpose of assigning profit/fee values. They shall not receive the working capital adjustment in Item 25. However, they may receive higher than normal values within the designated range to the extent that portions of cost are fixed.
(6) When the contract contains provisions for performance-based payments, do not compute a working capital adjustment.

Note that fixed-price contracts with financing have lower profit/fee ranges and normal values than fixed-price contracts with no financing. The lower values consider the fact that the contractor assumes less financial risk when the Government provides financing.

- **Assign Appropriate Profit/Fee Value.** Use the normal value for each contract type unless you can justify a higher or lower value.
- The elements that you should consider include:
  - Length of contract,
  - Adequacy of cost data projections,
  - Economic environment,
  - Nature and extent of subcontracted activity,
  - Contractor protection under contract provisions (e.g., economic price adjustment clauses),
  - Ceilings and share lines contained in incentive provisions, and
- Risks associated with contracts for foreign military sales (FMS) which are not funded by U.S. appropriations.

- When the contract contains provisions for performance-based payments:
  - The frequency of payments,
  - The total amount of payments compared to the maximum allowable amount specified at FAR 32.1004(b)(2), and
  - The risk of the payment schedule to the contractor.

- In determining the appropriate value to assign, **assess the extent to which costs have been incurred prior to definitization of the contract action**. Your assessment must consider any reduced contractor risk on both the contract before definitization and the remaining portion of the contract. When costs have been incurred prior to definitization, generally regard the contract type risk to be at the low end of the designated range. If a substantial portion of the costs have been incurred prior to definitization, you may assign a value as low as 0 percent, regardless of contract type.

- Within the range prescribed for a particular contract type, the assigned profit/fee value should be consistent with the value for performance risk. It would be incongruous to assign a high value for contract type risk and a low value for performance risk, or vice versa.

### Assigning a Profit/Fee Value for Contract-Type Risk

<table>
<thead>
<tr>
<th>Consider</th>
<th>When</th>
</tr>
</thead>
</table>
| **Above Normal Weight** | - There is minimal cost history;  
- Long-term contracts without provisions protecting the contractor, particularly when there is considerable economic uncertainty;  
- Incentive provisions (e.g., cost and performance incentives) place a high degree of risk on the contractor; or  
- Contract is for FMS sales (other than those under DoD cooperative logistics support arrangement or those made from U.S. Government inventories or stocks) where the contractor can demonstrate that there are substantial risks above those normally present in DoD contracts for similar items.  
- An aggressive performance-based payment schedule that increases risk. |
| **Below Normal Weight** | - Contract is for a very mature product line with extensive cost history;  
- Contract is for a relatively short term;  
- Contractual provisions substantially reduce the contractor’s risk;  
- Incentive provisions place a low degree of risk on the contractor;  
- Performance-based payments totaling the |
maximum allowable amount(s) specified at FAR 32.1004(b)(2); or

- A performance-based payment schedule that is routine with minimal risk.

- **Contract-Type Risk Profit/Fee Base.** Enter the value from Item 20 as the "Contract Type Risk Base" (Item 24).

- **Calculate Cost Risk Profit/Fee Objective.** To calculate the "Contract Type Risk Profit Objective" (Item 24), multiply the "Contract Type Risk Assigned Value," by the "Contract Type Risk Base" (Item 20) as shown in the example below:

  For example: A firm fixed-price contract with normal progress payments, normal risk, and the cost structure presented in earlier in this chapter would require the following calculations.

<table>
<thead>
<tr>
<th>Item</th>
<th>Contractor Risk Factor</th>
<th>Assigned Value</th>
<th>Base (Item 20)</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.</td>
<td>Contract Type Risk</td>
<td>3.0%</td>
<td>$742,000</td>
<td>$22,260</td>
</tr>
</tbody>
</table>

  *Working Capital Profit/ Fee Adjustment (DFARS 215.404-71-3).* Item 25 of the form recognizes contractor working capital investment, the money required to finance contract expenses until contract payment is received. It only applies to fixed-priced contracts with Government financing.

- Calculate the Costs Financed.
  
  o Identify contract "Total Costs Objective" (excluding facilities capital cost of money) in Item 20.
  
  o Reduce the “Total Costs Objective” as appropriate when:
    
    - The contractor has little cash investment (e.g. subcontractor progress payments liquidate late in the period of performance).
    
    - Some costs are covered by special financing provisions such as advance payments.
    
    - The contract is multi-year and there are special funding arrangements.
  
  o Calculate the portion of contract cost financed by the contractor. Normally that is 100% minus the customary progress payment rate. On contracts that provide flexible progress payments or progress payments to small business, use the customary rate for large businesses.
  
  o Calculate the "Working Capital Costs Financed" by multiplying "Total Costs Objective" by the percentage of costs financed by the contractor.

- **Select the Appropriate Contract Length Factor.** The "Length Factor" (Item 25) is related to the period of time that the contractor will have a working capital investment in the contract.

  o The period of substantive performance that you use to select the length factor:
    
    - Is based on the time necessary for the contractor to complete the substantive portion of the work.
    
    - Is not necessarily based on the entire period of time between contract award and final delivery (or final payment). It should exclude any periods of minimal contract performance.
    
    - Should not be based on periods of performance contained in option provisions.
    
    - Should not, for multi-year contracts, include periods of performance beyond that required to complete the initial program year's requirements.
- Should be based on a weighted average contract length when the contract has multiple deliveries.
- May be estimated using sampling techniques provided the sampling techniques produce a representative result.
  - After you determine the period of substantive performance use the following table to select the appropriate contract length factor.

<table>
<thead>
<tr>
<th>Period of Substantive Performance</th>
<th>Length Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 months or less</td>
<td>.40</td>
</tr>
<tr>
<td>22 to 27 months</td>
<td>.65</td>
</tr>
<tr>
<td>28 to 33 months</td>
<td>.90</td>
</tr>
<tr>
<td>34 to 39 months</td>
<td>1.15</td>
</tr>
<tr>
<td>40 to 45 months</td>
<td>1.40</td>
</tr>
<tr>
<td>46 to 51 months</td>
<td>1.65</td>
</tr>
<tr>
<td>52 to 57 months</td>
<td>1.90</td>
</tr>
<tr>
<td>58 to 63 months</td>
<td>2.15</td>
</tr>
<tr>
<td>64 to 69 months</td>
<td>2.40</td>
</tr>
<tr>
<td>70 to 75 months</td>
<td>2.65</td>
</tr>
<tr>
<td>76 months or more</td>
<td>2.90</td>
</tr>
</tbody>
</table>

- **Identify the Interest Rate.** Identify the "Interest Rate" determined semi-annually by the Secretary of the Treasury under Public Law 92-41. This rate is also known as: Renegotiation Board Interest Rate; Prompt Payment Act Interest Rate; Contract Dispute Act Interest Rate; and Facilities Capital Cost of Money Rate. The rate can be found on the Bureau of the Public Debt's Prompt Payment Act Interest Rate webpage.

- **Calculate Working Capital Profit/Fee Objective.** To calculate the "Working Capital Profit Objective" (Item 25), multiply the "Costs Financed" by the "Length Factor" and then multiply the product from that calculation by the "Interest Rate" as shown in the example below. The adjustment must not exceed four percent of the "Total Costs" in Item 20 of the form.

For example: Using the above approach with a contract cost of $742,000, progress payments of 80 percent, substantive period of performance of 25 months, and an interest rate of 5.25 percent, the calculation would be:

**Step 1.** Calculate the Costs Financed:
Total Costs Objective x (1.00 - Progress Payment Rate)
$742,000 x (1.00 - .80)
$742,000 x .20
$148,400

**Step 2.** Select the Appropriate Contract Length Factor:
.65 is the length factor for a 25 month substantive period of performance.

**Step 3.** Identify the Interest Rate:
5.25 percent is the interest rate.

**Step 4.** Calculate Working Capital Profit/Fee Objective:
Costs Financed x Length Factor x Interest Rate
$148,400 \times 0.65 \times 0.0525
$5,064 (rounded down from $5064.15)
The figures in Item 25 of the form would appear as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Contractor Risk Factor</th>
<th>Costs Financed</th>
<th>Length Factor</th>
<th>Interest Rate</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Working Capital</td>
<td>$148,400</td>
<td>0.65</td>
<td>5.25%</td>
<td>$5,064</td>
</tr>
</tbody>
</table>

Facilities Capital Employed Profit/ Fee Analysis (DFARS.215.404-71-4). This section recognizes contractor investment in equipment.

- **Determine the Facilities Capital Employed.** As you learned in Chapter 10, total facilities capital employed is calculated by dividing the facilities capital cost of money allowed on the contract by the cost of money rate using the DD Form 1861, Contract Facilities Capital Cost of Money. The total facilities capital employed is then distributed into three components, land, buildings, and equipment, using Section 7 of the DD Form 1861. The facilities capital employed dollar figure for each component is then transferred to the appropriate “Amount Employed” column of DD Form 1547 -- Item 26 for land, Item 27 for buildings, or Item 28 for equipment.

- **Select the Appropriate Profit/Fee Value Range.** After transferring the facilities capital employed to the DD Form 1547, assign a profit/fee value to equipment capital employed. Facilities investments in land and buildings are not rewarded in profit/fee analysis because the Government does not appreciably benefit from investments in land and buildings. The following table shows the designated ranges and normal values for each:

<table>
<thead>
<tr>
<th>Profit/Fee Values for Facilities Capital Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
</tr>
<tr>
<td>Standard --used for most contracts.</td>
</tr>
</tbody>
</table>

- **Assign Appropriate Profit/Fee Value.**
  - As you assign a profit/fee objective value to equipment employed:
    - Relate the usefulness of the equipment to the goods or services being acquired under the prospective contract.
    - Analyze the productivity improvements and other anticipated industrial base enhancing benefits resulting from the investment in equipment, including:
      - The economic value of the equipment, such as physical age, undepreciated value, idleness, and expected contribution to future defense needs; and
      - The contractor’s level of investment in defense related equipment as compared with the portion of the contractor’s total business which is derived from the DoD.
    - Consider any contractual provisions that reduce the contractor’s risk of investment recovery (e.g., a termination protection clause, capital investment indemnification, and productivity saving rewards).
  - You should assign the normal value unless you can justify a higher or lower value. Consider the following table:
Assigning a Profit/Fee Value for Facilities Capital Employed

<table>
<thead>
<tr>
<th>Consider .</th>
<th>When .</th>
</tr>
</thead>
</table>

Significantly Above Normal Weight

There are direct and measurable benefits in efficiency and significantly reduced acquisition costs on the effort being priced. Maximum values apply only to those cases where the benefits of the facilities capital investment are substantially above normal.

Above Normal Weight

There are direct, identifiable, and exceptional benefits, such as:
- New investments in state-of-the-art technology which reduce acquisition cost or yield other tangible benefits such as improved product quality or accelerated deliveries;
- Investments in new equipment for research and development applications.

Below Normal Weight

The capital investment has little benefit to DoD, for example:
- Allocations of capital apply predominately to commercial product lines;
- Investments are for such things as furniture and fixtures, corporate aircraft, or gymnasiums; or
- Facilities are old or extensively idle.

Significantly Below Normal Weight

A significant portion of defense manufacturing is done in an environment characterized by outdated, inefficient, and labor-intensive capital equipment.

- **Calculate the Facilities Employed Capital Profit/Fee Objective.** Using the above approach, normal assigned values, and facilities capital employed figures from Chapter 10, Section 6 could look like this:

<table>
<thead>
<tr>
<th>Item</th>
<th>Contractor Facilities Capital Employed</th>
<th>Assigned Value</th>
<th>Amount Employed</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Land</td>
<td></td>
<td>$47,320</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Buildings</td>
<td></td>
<td>$118,300</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Equipment</td>
<td>17.5%</td>
<td>$70,980</td>
<td>$12,422</td>
</tr>
</tbody>
</table>

*The Cost Efficiency Factor.* ([DFARS 215.404-71-5](#)) This is a special factor that encourages contractors to reduce costs. Contracting officers may use this factor to increase the prenegotiation profit objective by an amount not to exceed 4% of total objective costs (Block 20 of the DD Form 1547). Contracting officers
may use this factor only when the contractor can demonstrate cost reduction efforts that benefit the pending contract.

The contracting officer shall consider criteria such as the following in evaluating whether or not to use the cost efficiency factor:

- The contractor’s participation in Single Process Initiative (SPI) improvements;
- Actual cost reductions achieved on prior contracts;
- Reduction or elimination of excess or idle facilities;
- The contractor’s cost reduction initiatives (e.g., competition advocacy programs, technical insertion programs, obsolete parts control programs, spare parts pricing reform, value engineering, outsourcing of functions such as information technology). Metrics developed by the contractor such as fully loaded labor hours (i.e., cost per labor hour, including all direct and indirect costs) or other productivity measures may provide the basis for assessing the effectiveness of the contractor’s cost reduction initiatives over time;
- The contractor’s adoption of process improvements to reduce costs;
- Subcontractor cost reduction efforts;
- The contractor’s effective incorporation of commercial items and processes; or
- The contractor’s investment in new facilities when such investments contribute to better asset utilization or improved productivity.

When selecting the percentage to use for this special factor, the contracting officer has maximum flexibility in determining the best way to evaluate the benefit the contractor’s cost reduction efforts will have on the pending contract. However, the contracting officer shall consider the impact that quantity differences, learning, changes in scope, and economic factors such as inflation and deflation will have on cost reduction.

**Example:** The contracting officer has evaluated the criteria listed above and decided that a cost efficiency factor of 1.5% is appropriate based on the contractor’s adoption of process improvements and small cost reductions achieved on a prior contract. The entry on the DD Form 1547 would appear as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Assigned Value</th>
<th>Base (Item 20)</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>Cost Efficiency Factor</td>
<td>1.5%</td>
<td>$742,000</td>
</tr>
</tbody>
</table>

**Total Profit/Fee Objective.** The total profit/fee objective is the sum of all profit/fee objectives calculated in Parts 2 - 6 of the DD Form 1547. For the on-going example used throughout this section, the total profit/fee objective would be:

<table>
<thead>
<tr>
<th>Item</th>
<th>Profit Factor</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.</td>
<td>Performance Risk (Composite)</td>
<td>$31,164</td>
</tr>
<tr>
<td>24.</td>
<td>Contract Type Risk</td>
<td>$22,260</td>
</tr>
<tr>
<td>25.</td>
<td>Working Capital</td>
<td>$5,064</td>
</tr>
<tr>
<td>28.</td>
<td>Equipment Facilities Capital Employed</td>
<td>$12,422</td>
</tr>
<tr>
<td>29.</td>
<td>Cost Efficiency Factor</td>
<td>$11,130</td>
</tr>
</tbody>
</table>
Negotiation Summary (DFARS 215.404-76). This part of the DD Form 1547 summarizes the proposed, objective, and negotiated cost and profit/fee positions. The section is primarily used for reporting to higher headquarters. Questions often arise regarding Line 35, "Markup Rate." The markup rate calculation includes both profit/fee and facilities capital cost of money as markup. As a result, offhand evaluations of the size of the markup can be misleading. The figures for on-going example would be:

<table>
<thead>
<tr>
<th>Item</th>
<th>Summary Elements</th>
<th>Proposed</th>
<th>Objective</th>
<th>Negotiated</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.</td>
<td>Total Costs</td>
<td>$742,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Facilities Capital Cost of Money</td>
<td>$18,928</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Profit</td>
<td>$82,040</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>Total Price (Line 31 + 32 + 33)</td>
<td>$842,968</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Markup Rate (line 32 + 33 divided by 31)</td>
<td>13.6%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Contracting Officer Approval. After completion of the negotiation, the DD Form 1547 must be signed and dated by the contracting officer.

Completed Price/fee Analysis The example below depicts a DD Form 1547, completed through Item 35 for the Government objective, using the figures from the on-going example used throughout this section.

RECORD OF WEIGHTED GUIDELINES APPLICATION

<table>
<thead>
<tr>
<th>1. REPORT NO.</th>
<th>2. BASIC PROCUREMENT INSTRUMENT IDENTIFICATION NO.</th>
<th>3. DATE OF ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. PURCHASING OFFICE</td>
<td>b. FY</td>
<td>c. TYPE PROC INST CODE</td>
</tr>
</tbody>
</table>

REPOR T CONT R O L SYMBO L DD- A&T(Q)1 751
### Contracting Office Code

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost Category</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Name of Contractor

<table>
<thead>
<tr>
<th>Item</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>I3</td>
<td>$90,000</td>
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<tr>
<td>I4</td>
<td>0</td>
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### DUNS Number

<table>
<thead>
<tr>
<th>Item</th>
<th>Federal Supply Code</th>
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</thead>
<tbody>
<tr>
<td>I5</td>
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</tbody>
</table>

### Federal Supply Code

<table>
<thead>
<tr>
<th>Item</th>
<th>Direct Labor</th>
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</thead>
<tbody>
<tr>
<td>I6</td>
<td>$22,400</td>
</tr>
<tr>
<td>I7</td>
<td>$36,400</td>
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</tbody>
</table>

### DOD Claimant Program

<table>
<thead>
<tr>
<th>Item</th>
<th>Contract Type Code</th>
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</thead>
<tbody>
<tr>
<td>I8</td>
<td></td>
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</table>

### Contract Type Code

<table>
<thead>
<tr>
<th>Item</th>
<th>Other Direct Charges</th>
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<tbody>
<tr>
<td>I9</td>
<td>$22,000</td>
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### Tal Costs (I3 thru I7)

<table>
<thead>
<tr>
<th>Item</th>
<th>Subtotal Costs</th>
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<tbody>
<tr>
<td>I10</td>
<td>$70,000</td>
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</table>

### Type Effort

<table>
<thead>
<tr>
<th>Item</th>
<th>Use Code</th>
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</thead>
<tbody>
<tr>
<td>I11</td>
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</tbody>
</table>

### Use Code

<table>
<thead>
<tr>
<th>Item</th>
<th>General and Administrative</th>
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<tbody>
<tr>
<td>I12</td>
<td>$42,000</td>
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</table>

### Total Costs (I8+I9)

<table>
<thead>
<tr>
<th>Item</th>
<th>Weighted Guidelines Profit Factors</th>
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</thead>
<tbody>
<tr>
<td>I13</td>
<td>$74,200</td>
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</table>

### Weighted Guidelines Profit Factors

<table>
<thead>
<tr>
<th>Item</th>
<th>Contractor Risk Factors</th>
<th>Assigned Weighting</th>
<th>Assigned Value</th>
<th>Base (Item 20)</th>
<th>Profit Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>I14</td>
<td></td>
<td></td>
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<td>I15</td>
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<td>I16</td>
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<tr>
<td>I17</td>
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<tr>
<td>I18</td>
<td></td>
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<td></td>
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<tr>
<td>I19</td>
<td></td>
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<tr>
<td>I20</td>
<td></td>
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<tr>
<td>---</td>
<td>------------------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>TECHNICAL</td>
<td>40%</td>
<td>4.5%</td>
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<td></td>
</tr>
<tr>
<td>22.</td>
<td>MANAGEMENT/COST CONTROL</td>
<td>60%</td>
<td>4.0%</td>
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</tr>
<tr>
<td>23.</td>
<td>PERFORMANCE RISK (COMPOSITE)</td>
<td>4.2%</td>
<td></td>
<td>$742,000 $31,164</td>
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</tr>
<tr>
<td>24.</td>
<td>CONTRACT TYPE RISK</td>
<td>3.0%</td>
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<td>$742,000 $22,260</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>WORKING CAPITAL</td>
<td>Costs Financed Length Factor Interest Rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$148,400 .65 5.25% $5,064</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>CONTRACTOR FACILITIES CAPITAL EMPLOYED</td>
<td>ASSIGNED VALUE AMOUNT EMPLOYED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>LAND</td>
<td>$47,320</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>BUILDINGS</td>
<td>$118,300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>EQUIPMENT</td>
<td>17.5%</td>
<td></td>
<td>$70,980 $12,422</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>COST EFFICIENCY FACTOR</td>
<td>ASSIGNED VALUE BASE (Item 20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5%</td>
<td></td>
<td>$742,000 $11,130</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>TOTAL PROFIT OBJECTIVE</td>
<td>$82,040</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NEGOTIATED SUMMARY</td>
<td>PROPOSED OBJE C TIVE NE G O T I A TE D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>TOTAL COSTS</td>
<td>$742,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FACILITIES CAPITAL COST OF MONEY (DD FORM 1861)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------</td>
<td>-------</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>$18,92 8</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>PROFIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>$82,04 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL PRICE (Line 31 + 32 + 33)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>$842,9 68</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MARKUP RATE (Line 32 + 33 divided by 31)</td>
<td>%</td>
<td>13.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td></td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CONTRACTING OFFICER APPROVAL**

<table>
<thead>
<tr>
<th>36. TYPED/PRINTED NAME OF CONTRACTING OFFICER (Last, First, Middle Initial)</th>
<th>37. SIGNATURE OF CONTRACTING OFFICER</th>
<th>38. TELEPHONE NUMBER</th>
<th>39. DATE SUBMITTED (YYY YMM DD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OPTIONAL USE**

<table>
<thead>
<tr>
<th>96.</th>
<th>97.</th>
<th>98.</th>
<th>99.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 11.2.2 Identifying Exempted Contract Actions


In the DoD, you generally must use the weighted guidelines approach for profit/fee analysis when you perform cost analysis of cost or pricing data to determine price reasonableness. However, you:

- May use an alternate structured approach for the following:
  - Contract actions under $500,000;
  - Architect-engineering or construction contracts;
  - Contracts primarily requiring delivery of material from subcontractors;
  - Termination settlements; or
  - Contracts for which the weighted guidelines would not produce a reasonable overall profit/fee and the head of the contracting activity approves use of an alternate approach in writing.

- Must use the modified weighted guidelines (described in [DFARS 215.404-72](https://www.fdsys.gov/CFR)) for contract actions with nonprofit organizations other than FFDRCs.

- Must not use weighted guidelines or an alternate approach for cost-plus-award-fee contracts. Instead follow the guidelines presented in [DFARS 215.404-74](https://www.fdsys.gov/CFR).

**Using an Alternate Structured Approach** ([DFARS 215.404-73](https://www.fdsys.gov/CFR)). When using an alternate structured approach, you may design your profit/fee analysis to meet the requirements of the acquisition situation. However, the alternate approach must:

- Consider the three basic components of profit--performance risk, contract type risk (including working capital), and facilities capital employed.

- Include an offset for any facilities capital cost of money included in contract cost. To calculate the
offset, reduce the overall prenegotiation profit objective by one percent of the total cost or the amount of facilities capital cost of money, whichever is less.

When you use an alternate approach, you must still complete a DD Form 1547, however, you are not required to complete Items 21 through 30. The profit amount in the negotiation summary of the DD Form 1547 must be the profit figure after the offset for facilities capital cost of money.

- 12.0 - Chapter Introduction
- 12.1 - Evaluating Overall Price Reasonableness With Price Analysis
- 12.2 - Recognizing Alternatives And Their Effect On Contract Price
  - 12.2.1 - Identifying And Considering The Effect Of Cost Drivers
  - 12.2.2 - Identifying And Ameliorating Sources Of Cost Risk
- 12.3 - Identifying Key Pricing Elements In Prenegotiation Objectives
- 12.4 - Documenting Prenegotiation Positions

12.0 Chapter Introduction
Having analyzed the individual elements of contract cost and profit/fee, you must now meld the results of those analyses into a single prenegotiation position on contract pricing.

12.1 Evaluating Overall Price Reasonableness With Price Analysis

Price Analysis (FAR 15.404-1(b)(1)). Price analysis is the process of examining and evaluating a proposed price to determine if it is fair and reasonable, without evaluating its separate cost elements and proposed profit.

Cost Analysis (FAR 15.404-1(a)(3)). Cost analysis is used to evaluate the reasonableness of individual cost elements. When cost analysis is performed, a price analysis shall also be performed to verify that the overall price offered is fair and reasonable. Effective cost analysis provides insight into what it will cost the firm to complete the contract using the methods identified. However, cost analysis does not necessarily provide a picture of what the market is willing to pay for the product involved. For that you need price analysis.

Remember the Pontiac Trans Am example: Suppose that you wanted to procure a custom-made automobile identical to a Pontiac Trans Am. At your request, your neighborhood mechanic agrees to build you such a car. In building the car, the mechanic gets competitive quotes on all the necessary parts and tooling, pays laborers only the minimum wage, and asks only a very small profit. How do you think the final price will compare to a car off an assembly line? Probably at least ten times more expensive. Parts alone may be five times more expensive. The entire cost of tooling will be charged to one car. Labor, although cheaper per hour, will likely not be as efficient as assembly-line labor. Is the price reasonable? That decision can only be made through price analysis.

Bases for Price Analysis (FAR 15.404-1(b)(2)). Price analysis always involves some form of comparison with other prices. As the contracting officer, you are responsible for determining the best price analysis technique(s) and procedure(s) to utilize to assist in determining that the contract price negotiated is fair and reasonable. Moreover, you should use all the techniques for which you have recent, reliable and valid data. Volume 1, Chapter 6, Paragraph 6.1 of this Contract Pricing Reference Guide discusses the bases for price analysis.

Resolving Differences Between Cost and Price Analysis (FAR 15.405(d)). If your price analysis does not support the findings of your cost analysis, you must reexamine your cost analysis result. Look for alternatives that will permit contract award at a reasonable price. Consider alternative methods of contract completion and closely examine contract for possible changes in contract requirements.

If the results of cost analysis and price analysis cannot be reconciled by the close of negotiations, the contracting officer must refer the contract action to a level above the contracting officer. The problem and the resolution should be documented.

12.2 Recognizing Alternatives And Their Effect On Contract Price

Consider contracting alternatives and their affect on contract price as you complete your analysis. Common alternatives affecting contract pricing involve changes in contract cost or cost risk that are
related to changes in contract schedule or other performance requirements.

- 12.2.1 - Identifying And Considering The Effect Of Cost Drivers

- 12.2.2 - Identifying And Ameliorating Sources Of Cost Risk

**Focus on Contracting Alternatives.** Most negotiators assume that contract schedule and other performance requirements cannot be changed under any circumstances. However, you can often negotiate a better deal for all contracting parties if you consider available alternatives. *Team Effort (FAR 1.102-3, FAR 1.102-4, and FAR 15.404-1(a)).* Take a team approach to the analysis of alternatives. Other members of the Acquisition Team (e.g., technical personnel, the auditor, the price analyst, and contractors) can provide invaluable insight into contract requirements and their affect on contract cost and cost risk.

**For example:** If you are considering alternatives related to a complex contract proposal, you will generally need support from technical personnel to evaluate the effect of any proposed alternative on contract cost or cost risk. You may also need analytical support from:

- Requiring activity personnel to determine the feasibility of proposed alternatives related to delivery timing, production or performance methods, and materials;
- Technical personnel to consider the effect of proposed alternatives on contract labor and material requirements; and
- The cognizant auditor to consider the effect of the proposed alternatives on labor rates, indirect cost rates, and material pricing.

However throughout any analysis of alternatives, remember that the contracting officer is ultimately responsible for acquiring required supplies and services from responsible sources at fair and reasonable prices.

**Caution About Alternatives (FAR 15.206(d) and FAR 15.306(e)).** Before bringing a potential alternative (or any other change in terms and conditions) to the negotiation table, you must consider the:

- Costs to the Government affected by the proposed alternative;
- Terms and conditions affected by the proposed alternative (including legal and regulatory requirements); and
- The nature of the discussions.

- In a non-competitive environment, you may directly negotiate changes in terms and conditions.
- In competitive procurements, you may need to amend the RFP and notify other offerors as provided in the FAR. Also remember that you must not reveal one offeror’s technical solution to another offeror, including:
  - Unique technology;
  - Innovative and unique uses of commercial items; or
  - Any information that would compromise an offeror’s intellectual property.

**12.2.1 Identifying And Considering The Effect Of Cost Drivers**

**Identifying Cost Drivers.** Cost drivers are those aspects of proposal or contract requirements that if changed would have a major impact on contract price. Possible cost drivers include contract terms and conditions, delivery requirements, or technical requirements. For example:

- If the contract does not allow for use of existing Government property, then offered prices may include costs for the acquisition or fabrication of additional tooling or test equipment.
- If delivery is needed on an expedited basis, then premium charges may be incurred.
- If contract technical requirements call for an expensive process when another less expensive process would meet the needs of end users, then offered prices would be fair but unreasonably high through no fault of the offerors.

**Considering the Cost Driver Effect on Contract Price.** Work with other members of the Acquisition Team
to identify the cost drivers that appear to be affecting contract price in the current acquisition environment. Having identified the factors that appear to be driving contract cost, you can begin reviewing the impact of alternatives. The following scenarios are examples of how you might consider the effect of schedule changes on contract price:

**Example 1.** Normal delivery time for Item A is six months after receipt of an order at a unit price of $1,000. The requiring activity wants the part in three months at the same price. The offeror can get the part in three months, but only at a premium price of $1,250. In this case, schedule is a cost driver with a shorter delivery schedule resulting in a cost increase.

**Example 2.** The requiring agency has requested delivery of Item B twelve months from today. The offeror has quoted a unit price of $5,000 for the 12-month delivery. At the same time, the offeror has offered to add this Item B requirement to a projected production run. By combining the requirements, a second set-up charge can be avoided and the part can be purchased for $4,500, but delivery cannot be made in less than 15 months. If the requiring activity cannot accept the 15 month delivery, schedule will be a significant cost driver.

**Example 3.** The proposal calls for a delivery 36 months after receipt of an order. During the technical analysis, you determined that the offeror's shop loading schedule would allow for delivery in 24 months. The proposed part has been in continuous production for several years and is "well down the improvement curve." The earlier delivery year has significantly lower projected labor rates, and the additional volume would significantly reduce overhead rates. As a result, earlier delivery should actually reduce contract cost.

### 12.2.2 Identifying And Ameliorating Sources Of Cost Risk

*Identify Sources of Cost Risk.* Most cost estimates, whether they are the offeror's proposed or the Government's recommended, include a "point estimate" -- the point estimate is an estimate of what the estimator believes is most likely to happen. In most cases, the point estimate is one of a range of possible costs.

Since things rarely happen exactly as predicted, there are usually variances between projected and actual costs. Known to statisticians as an error probability distribution, the greater the potential variability between the projected and actual cost, the greater the cost risk.
Even in the case of a line-of-best-fit trend analysis, you are dealing with a point estimate—a point on the best-fit line with a probability distribution surrounding it.
Identify Means of Reducing or Controlling Contractor Cost Risk. Remember that there are a variety of methods that you should consider for reducing and controlling contract cost. Among the most important are the appropriate use of:

- An appropriate contract type;
- Clear technical requirements;
- Government furnished property; and
- Other contract terms and conditions.

### 12.3 Identifying Key Pricing Elements In Prenegotiation Objectives

**Pricing Elements by Contract Type.** In preparing your negotiation objective, you must establish a position on each of the key elements that will define the contract pricing arrangement. Depending on the contract type, you may be able to restrict negotiations to total price or you may be required to negotiate agreement on several elements needed to define the pricing arrangement.

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Pricing Elements Requiring Negotiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm fixed-price and firm fixed-price level of effort &lt;br&gt; Far 16.202, 16.207</td>
<td>Total price</td>
</tr>
<tr>
<td>Fixed-price economic price adjustment &lt;br&gt; Far 16.203</td>
<td>Base price&lt;br&gt; Contract amount subject to adjustment&lt;br&gt; Basis for determining economic adjustment&lt;br&gt; Limits on economic adjustment</td>
</tr>
<tr>
<td>Fixed-price incentive firm &lt;br&gt; Far 16.403-1</td>
<td>Target cost&lt;br&gt; Target profit&lt;br&gt; Cost sharing arrangement under target cost&lt;br&gt; Cost sharing arrangement over target cost&lt;br&gt; Ceiling price</td>
</tr>
<tr>
<td>Fixed-price incentive successive targets &lt;br&gt; Far 16.403-2</td>
<td>Initial target cost&lt;br&gt; Initial target profit&lt;br&gt; Initial cost sharing arrangement under target&lt;br&gt; Initial cost sharing arrangement over target&lt;br&gt; Ceiling for firm target profit&lt;br&gt; Floor for firm target profit&lt;br&gt; Point(s) where firm target cost and firm target profit will be negotiated&lt;br&gt; Ceiling price</td>
</tr>
<tr>
<td>Fixed-price with prospective price redetermination &lt;br&gt; Far 16.205</td>
<td>Firm fixed-price for initial period&lt;br&gt; Stated time(s) for prospective price redetermination</td>
</tr>
<tr>
<td>Fixed-price contract with retroactive price redetermination &lt;br&gt; Far 16.206</td>
<td>Fixed ceiling price&lt;br&gt; Agreement to price redetermination after contract completion</td>
</tr>
<tr>
<td>Contract Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Fixed-price award fee FAR 16.404</td>
<td>Fixed price (including normal profit) Award fee pool Plan for periodic evaluation</td>
</tr>
<tr>
<td>Cost-plus-incentive-fee FAR 16.405-1</td>
<td>Target cost Target fee Cost sharing arrangement under target cost Cost sharing arrangement over target cost Minimum fee Maximum fee</td>
</tr>
<tr>
<td>Cost-plus-award-fee FAR 16.405-2</td>
<td>Estimated cost Base fee Award fee</td>
</tr>
<tr>
<td>Cost-plus-fixed-fee FAR 16.306</td>
<td>Estimated cost Fixed fee</td>
</tr>
<tr>
<td>Time-and-materials FAR 16.601</td>
<td>Labor-hour rate(s) Material handling costs (indirect costs) or provision to charge material on a basis other than cost Ceiling price</td>
</tr>
<tr>
<td>Labor-hour FAR 16.602</td>
<td>Labor-hour rate(s) Ceiling price</td>
</tr>
</tbody>
</table>

Relationship Between Price and Contract Type (FAR 16.103(b)). As you prepare your negotiation objectives, remember that the contract type decision itself is subject to negotiation. Contract type and contract prices are closely related and should be negotiated together. The objective is to negotiate a contract type and price (or estimated cost and fee) that will result in reasonable contractor risk and provide the contractor with the greatest incentive for efficient and economical contract performance.

### 12.4 Documenting Prenegotiation Objectives

**Prenegotiation Documentation (FAR 15.406-1).**

The prenegotiation objectives establish the Government's initial negotiation position. They assist in the contracting officer's determination of fair and reasonable price. They should be based on the results of the contracting officer's analysis of the offeror's proposal, taking into consideration all pertinent information including field pricing assistance, audit reports and technical analysis, fact-finding results, independent Government cost estimates and price histories. The contracting officer shall establish prenegotiation objectives before the negotiation of any pricing action. The scope and depth of the analysis supporting the objectives should be directly related to the dollar value, importance, and complexity of the pricing action. When cost analysis is required, the contracting officer shall document the pertinent issues to be negotiated, the cost objectives, and a profit or fee objective. Prenegotiation objectives shall be documented and reviewed in accordance with departmental procedures (DFARS PGI 215.406-1(b)). Many contracting activities have formats and templates to assist in establishing the prenegotiation objectives. These documents are commonly referred to as prenegotiation or business clearance memoranda. You should follow your department's procedures and use prescribed formats and/or templates.

FAR 15.406-3(a) and DFARS PGI 215.406-3(a) provide a list of principal elements that must be included in the final Price Negotiation Memorandum. You should draft the following elements of the Price Negotiation Memorandum (PNM) before negotiations:

- **Purpose of the negotiation** (new contract, final pricing, etc.)
- **Description of the acquisition**, including appropriate identifying numbers (e.g., RFP number).
- **The name, position, and organization of each person who will be participating in planned**
prenegotiation and negotiation activities.

- The current status of any contractor systems (e.g., purchasing, estimating, accounting, and compensation) to the extent they were considered in developing the prenegotiation objective.
- If the offeror was not required to submit certified cost or pricing data to support any price negotiation over the cost or pricing data threshold, the exception used and the basis for using it.
- If the offeror was required to certified submit cost or pricing data, the extent to which the contracting officer:
  - Relied on the data submitted and used them in preparing negotiation objectives;
  - Recognized any submitted data as inaccurate, incomplete, or noncurrent and the action that the contracting officer has taken or will take regarding the data; or
  - Determined that an exception applies and will not require certification.
- A summary of the contractor’s proposal, field pricing assistance, audits and internal analyses, and the Government prenegotiation objective. When significant audit or other specialists recommendations are not adopted in the prenegotiation objective, the contracting officer should provide rationale that supports the objective position and fully explain the reasons for divergence from the recommendations.
- A summary of the most significant facts or considerations controlling the establishment of the prenegotiation price objective.
- A summary and quantification of any significant effect that direction from Congress, other agencies, or higher-level officials (i.e., officials who would not normally exercise authority during the contract award and review process) has had on the contract action.
- The basis for the profit/fee prenegotiation objective. Include a copy of the DD Form 1547, Record of Weighted Guidelines Applications (DFARS 215.404-70), if used, with supporting rationale. You must provide rationale for not utilizing the Weighted Guidelines methodology when its use would otherwise be required by DFARS 215.404-4.

Additional Documentation. In preparing your prenegotiation documentation, you should also document any important aspects of the procurement situation that affected your prenegotiation objectives, such as:

- The items or services and quantities being purchased.
- The place of contract performance.
- The delivery schedule or period of performance.
- Any differences between the proposed delivery schedule and the objective schedule.
- Any previous buys of similar products and related information:
  - When.
  - How many were acquired.
  - Schedule/production rate.
  - Contract type.
  - Unit prices or total prices, including both target and final prices, if applicable.
- Any Government-furnished material which will be provided as a result of the contract and its estimated dollar value.
- Any unique aspects of the procurement action.
- Any outside influences or time pressures associated with the procurement (e.g., procurement priority and funding limitations).
Summarizing Prenegotiation Positions. As a minimum, your prenegotiation documentation should outline the offeror's estimating rationale, the Government's prenegotiation objective, and key differences between the two positions. Generally, this summary begins with a tabular presentation similar to the following:

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Proposed</th>
<th>Objective</th>
<th>Difference</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Labor</td>
<td>$1,000,000</td>
<td>$900,000</td>
<td>$100,000</td>
<td>See Para A</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhead</td>
<td>$2,500,000</td>
<td>$2,025,000</td>
<td>$475,000</td>
<td>See Para B</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$3,500,000</td>
<td>$2,925,000</td>
<td>$575,000</td>
<td></td>
</tr>
<tr>
<td>G&amp;A Expense</td>
<td>$350,000</td>
<td>$292,500</td>
<td>$57,500</td>
<td>See Para C</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$3,850,000</td>
<td>$3,217,500</td>
<td>$632,500</td>
<td></td>
</tr>
</tbody>
</table>

Using this type of tabular cost element summary, you can identify the areas and degree of differences and provide a general format for more detailed analysis.

- In Paragraph A, describe the rationale used by the offeror in developing the proposal and by the Government in developing the Government objective. Focus on the differences between the two positions. Also reference any audit or technical reports and outline your proposed disposition for any significant findings.

- In Paragraphs B and C, address the same subjects found in Paragraph A with one major exception. Since these are overhead and G&A expense rates, you need to address whether the dollar differences are the result of differences in the application base or in the rates themselves. If you look closely at the detailed examples below, you will see that the engineering overhead dollar reductions are the result of both reduced engineering labor dollars (the indirect cost base) and a reduced engineering overhead rate. For G&A expense, the difference is only in the subtotal dollars used as the allocation base with no difference in the G&A rate.

<table>
<thead>
<tr>
<th>Engineering Overhead</th>
<th>Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed</td>
<td>$1,000,000 x 250% = $2,500,000</td>
</tr>
<tr>
<td>Objective</td>
<td>$900,000 x 225% = $2,025,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General &amp; Administrative Expense</th>
<th>Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed</td>
<td>$3,500,000 x 10% = $350,000</td>
</tr>
<tr>
<td>Objective</td>
<td>$2,925,000 x 10% = $292,500</td>
</tr>
</tbody>
</table>

Consider Risk by Developing a Range of Positions. The Government objective is a point estimate within a range of reasonable prices. The most likely cost estimate should be your objective, but you should consider other reasonable positions based on the information available. While your agency or contracting activity guidance may vary, the classic approach to developing a negotiation range calls for three positions -- minimum, objective, and maximum.

- **Objective.** The Government cost objective should be your best estimate of what the effort should cost, and the position where you would ideally like to settle.

- **Minimum.** The minimum, sometimes called the "going in position," should be at the low end of
the reasonable range. In effect, you are saying that a price lower than the minimum is unreasonably low. Support this position with a detailed rationale. If you use the minimum as your opening offer, you must be ready to explain to the offeror why that position is reasonable.

There may be situations where the offeror has proposed a cost below what you believe is a reasonable minimum objective. In such situations, you should present to the offeror your reasons for believing that the proposed cost is unreasonably low. If the offeror fails to change or support the cost, you must consider that failure in your analysis of proposal cost realism.

- **Maximum.** The maximum is at the high end of the reasonable range. In effect, you are saying that a price higher than the maximum is unreasonably high. You would not go above your maximum without additional data that would validate a higher figure. If you needed a negotiation clearance prior to entering negotiations, you will likely have to seek another approval before negotiating a price higher than the maximum. In any event, if you exceed the maximum, be prepared to document a clear audit trail of how you concluded a higher price was both fair and reasonable.

**Document the References Used in Position Development.** Documentation of the reference documents used in developing your negotiation positions is essential. You need to be able to find key references during management review of contract negotiation objectives, during negotiations, and during preparation of the price negotiation memorandum. If a question arises later concerning defective pricing, it is vital that you have a detailed record of the information that you relied on during negotiations.

**Price Prenegotiation Memorandum Checklist.** The Price Prenegotiation Memorandum Checklist presented below highlights points that you should consider as you prepare for price negotiations. Your prenegotiation objectives must be documented and reviewed in accordance with your department’s or agency’s procedures. This checklist provides a guide to important points that you should consider as you complete your contract pricing position.

<table>
<thead>
<tr>
<th>Price Prenegotiation Memorandum Checklist 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject Line</strong></td>
</tr>
<tr>
<td>1. Identify company/division/cost center and location.</td>
</tr>
<tr>
<td>2. Show contract or solicitation number.</td>
</tr>
<tr>
<td>3. Identify item to be purchased.</td>
</tr>
<tr>
<td>4. Identify fiscal year funds.</td>
</tr>
</tbody>
</table>

**Memorandum Text**

**Introductory Summary**

1. Provide comparative figures summarizing pricing elements of the proposal, objective, and differences, by cost, profit/fee, price, profit/fee rate, and when applicable:
   - Incentive share
   - Minimum/maximum fee
   - Ceiling price and percentage of target cost
   - Option prices
   - Type contract

**Particulars**

1. Identify dates, places, and participants in fact-finding.
2. Identify quantities being negotiated.
3. Show unit prices quoted and objective.

**Procurement Situation**

1. Identify type of negotiation action (e.g., a new contract).
2. Describe contract items or services included in objective amount and identify status (development, production, etc.).
4. Show delivery schedule or period of performance.
5. State if there is any differences between the delivery schedule objective and the
delivery schedule proposed.

6. State whether there have been any previous buys of similar products, and if so identify:
   - When
   - How many
   - Schedule/production rate
   - Contract type
   - Unit prices or total prices including both target and final prices if applicable

7. Identify if Government facilities will be furnished as a result of the contract, and, if so, the estimated dollar value.

8. Describe any unique features of the procurement action; for example should-cost, design-to-cost, life-cycle cost, or special provisions affecting cost.

9. Describe any outside influences or time pressures associated with the procurement; for example, procurement priority, funding limitations, etc.

Prenegotiation Summary

1. Show proposed costs, prenegotiation objectives, and differences, tabulated in parallel form by major element of cost.

2. Identify the major considerations in pricing each major cost element in a separate paragraph showing when applicable:
   - Treatment accorded the element in the proposal including derivation of the estimate and "as of" data used as a basis for projection.
   - Availability, adequacy, and use of subcontractor cost or pricing data.
   - Extent and adequacy of offeror review of subcontract proposals.
   - Describe how the Government objective for each major cost element was developed.
   - Consideration given to information contained in in-house technical evaluations, field analyses, or audit reports.
   - Description of any additional or updated information obtained during fact-finding and the consideration given to it.
   - Identification of any offeror provided data that formed the basis of the objective.
   - Identification of any data or information relied on instead of contractor provided data
   - Impact of the procurement on company volume and its impact, if any, on each major cost element.
   - If economic adjustment, specified contingencies, savings clauses, or other provisions are included, describe the details and rationale for use.

3. Describe, in a separate paragraph, how the Government profit objective was developed.
   - If structured approach used, rationale supporting assigned weights.
   - If structured approach not used, details on alternate approach and any weights used.

4. Justify the contract type selected including, as applicable:
   - Share line
   - Ceiling price

Miscellaneous

1. Identify audit reports received.
2. Identify contractor reviews received:
   - Purchasing system
   - Accounting system
   - Estimating system
   - Property management system
   - Earned value management system
Volume 4 – Advanced Issues in Contract Pricing

1.0 Chapter Introduction

When used in this chapter, the terms “contract type” and “type of contract” refer to the contract compensation arrangement. The contract compensation arrangement is the method of determining the dollars due to the contractor under the contract. In this chapter, you will learn about the development and application of common compensation arrangements:

1.1 Matching Contract Type To Contract Risk

Points to Consider (FAR 16.103). Contract type selection is the principal method of allocating cost risk between the Government and the contractor. There is no single contract type that is right for every contracting situation. Selection must be made on a case-by-case basis considering contract risk, incentives for contractor performance, and other factors such as the adequacy of the contractor’s accounting system. Your objective should be to select a contract type that will result in reasonable contractor risk with the greatest incentive for efficient and economical contract performance. Selecting the proper contract type will make the work more attractive to more potential offerors, thereby increasing competition.

As you match contract type to contract risk, consider the following:

- Identify available contract types;
- Consider acquisition method;
- Consider commerciality of the requirement;
- Consider cost risk associated with the contract action;
- Consider appropriate performance incentives;
- Consider the accounting system adequacy; and
- Document the selection decision.

Identify Available Contract Types. The table on the following pages compares the most common type of contract arrangements. Most of those arrangements fit into two general categories fixed-price and cost-reimbursement, but labor-hour and time-and-materials contracts have characteristics of both:

- **Fixed-Price** (FAR Subpart 16.2). Under a fixed-price contract, the contractor agrees to deliver the product or service required at a price not in excess of the agreed-to maximum. Fixed-price contracts should be used when the contract risk is relatively low, or defined within acceptable limits, and the contractor and the Government can reasonably agree on a maximum price. Contract types in this category include:
  - Firm fixed-price (FFP)
  - Fixed-price economic price adjustment (FPEPA)
  - Fixed-price award-fee (FPAF)
  - Fixed-price incentive firm (FPIF)
  - Fixed-price incentive with successive targets (FPIS)
  - Fixed-price contract with prospective price redetermination (FPRP)
  - Fixed-ceiling-price contract with retroactive price redetermination (FPRR)
  - Firm fixed-price level of effort term contract (FFPLOE)

- **Cost-Reimbursement** (FAR Subpart 16.3). Under a cost-reimbursement contract, the
contractor agrees to provide its best effort to complete the required contract effort. Cost-reimbursement contracts provide for payment of allowable incurred costs, to the extent prescribed in the contract. These contracts include an estimate of total cost for the purpose of obligating funds and establishing a ceiling that the contractor cannot exceed (except at its own risk) without the approval of the contracting officer. Contract types in this category include:

- Cost (CR)
- Cost-sharing (CS)
- Cost-plus-fixed-fee (CPFF)
- Cost-plus-award-fee (CPAF)
- Cost-plus-incentive-fee (CPIF)

**Labor-Hour and Time-and-Materials** *(FAR Subpart 16.6)*. There are two other types of contract compensation arrangements that do not completely fit the mold of either fixed-price or cost-reimbursement contracts. Labor-hour and time-and-materials contracts both include fixed labor rates but only estimates of the hours required to complete the contract. They are generally considered to most resemble cost-reimbursement contracts because they:

- Do not require the contractor to complete the required contract effort within an agreed-to maximum price; and
- Pay the contractor for actual hours worked.

<table>
<thead>
<tr>
<th>Comparison of Major Contract Types</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Principal Risk to be Mitigated</strong></td>
</tr>
<tr>
<td>Firm Fixed-Price (FFP)</td>
</tr>
<tr>
<td>None. Thus, the contractor assumes all cost risk.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use When..</th>
</tr>
</thead>
<tbody>
<tr>
<td>The requirement is well-defined.</td>
</tr>
<tr>
<td>Contractors are experienced</td>
</tr>
<tr>
<td>The market prices at risk are severable and significant. The risk stems from industry-</td>
</tr>
<tr>
<td>A ceiling price can be established that covers the most probable risks</td>
</tr>
<tr>
<td>Judgmental standards can be fairly applied by an Award-fee panel. The</td>
</tr>
<tr>
<td>The Government needs a firm commitment from the contractor to deliver the supplies</td>
</tr>
<tr>
<td>Elements</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Contractor is Obligated to:</td>
</tr>
<tr>
<td>Contrac tor Incentive (other than maximizing goodwill)</td>
</tr>
<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Generally realizes an additional dollar of profit for every dollar that costs are reduced.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical Application</th>
<th>Commerci al supplies and services.</th>
<th>Long-term contracts for commercial supplies during a period of high inflation</th>
<th>Productio n of a major system based on a prototype</th>
<th>Performan ce-based service contracts.</th>
<th>Long-term production of spare parts for a major system.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Principa l Limitati ons in FAR Parts 16, 32, 35, and 52</th>
<th>Generally NOT appropriate for R&amp;D.</th>
<th>Must be justified.</th>
<th>Must be negotiated .</th>
<th>Must be negotiated .</th>
<th>MUST be negotiated . Contractor must have an adequate accounting system that supports the pricing periods. Prompt redeterminations.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Variant s</th>
<th>Firm Fixed-price Level of Effort.</th>
<th>Successiv e Targets</th>
<th>Retroactive Redetermin ation</th>
</tr>
</thead>
</table>

1 Goodwill is the value of the name, reputation, location, and intangible assets of the firm.
### Comparison of Major Contract Types

<table>
<thead>
<tr>
<th>Cost-Plus Incentive-Fee (CPIF)</th>
<th>Cost-Plus Award-Fee (CPAF)</th>
<th>Cost-Plus Fixed-Fee (CPFF)</th>
<th>Cost or Cost-Sharing (C or CS)</th>
<th>Time &amp; Materials (T&amp;M)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Principal Risk to be Mitigated</strong></td>
<td>Highly uncertain and speculative labor hours, labor mix, and/or material requirements (and other things) necessary to perform the contract. The Government assumes the risks inherent in the contract -benefiting if the actual cost is lower than the expected cost-losing if the work cannot be completed within the expected cost of performance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Use When..</strong></td>
<td>An objective relationship can be established between the fee and such measures of performance as actual costs, delivery dates, performance benchmarks, and the like.</td>
<td>Objective incentive targets are not feasible for critical aspects of performance. Judgmental standards can be fairly applied.¹ Potential fee would provide a meaningful incentive.</td>
<td>Relating fee to performance (e.g., to actual costs) would be unworkable or of marginal utility.</td>
<td>The contractor expects substantial compensating benefits for absorbing part of the costs and/or foregoing fee or The vendor is a non-profit entity</td>
</tr>
<tr>
<td><strong>Elements</strong></td>
<td>• Target cost</td>
<td>• Target cost</td>
<td>• Target cost</td>
<td>• Target cost</td>
</tr>
<tr>
<td></td>
<td>• Performance targets (optional)</td>
<td>• Standard costs for evaluating performance</td>
<td>• Fixed fee</td>
<td>• If CS, an agreement on the Government's share of the cost.</td>
</tr>
<tr>
<td></td>
<td>• A minimum, maximum, and target fee</td>
<td>• A base and maximum fee</td>
<td></td>
<td>• No fee</td>
</tr>
<tr>
<td></td>
<td>• A formula for adjusting fee based on</td>
<td>• Procedures for adjusting fee, based on performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Costs and/or Performance</td>
<td>Contractual Performance</td>
<td>Typical Application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------</td>
<td>---------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make a good faith effort to meet the Government's needs within the estimated cost in the Schedule.</td>
<td>Make a good faith effort to meet the Government's needs within the ceiling price.</td>
<td>Research and development of the prototype for a major system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realizes a higher fee by completing the work at a lower cost and/or by meeting other objective performance targets.</td>
<td>Realizes a higher rate of return (i.e., fee divided by total cost) as total cost decreases.</td>
<td>Large scale research study.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realizes a higher fee by meeting judgmental performance standards.</td>
<td>If CS, shares in the cost of providing a deliverable of mutual benefit.</td>
<td>Research study.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Application</td>
<td>Joint research with educational institutions.</td>
<td>Emergency repairs to heating plants and aircraft engines.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Principal Limitations in FAR Parts 16, 32, 35, and 52**

- The contractor must have an adequate accounting system. The Government must exercise surveillance during performance to ensure use of efficient methods and cost controls. Must be negotiated. Must be justified. Statutory and regulatory limits on the fees that may be negotiated. Must include the applicable Limitation of Cost clause at FAR 52.232-20 through 23.
- Labor rates must be negotiated. MUST be justified. The Government MUST exercise appropriate surveillance to ensure efficient performance.

**Variants**

- Completio
- Labor Hour
Consider Acquisition Method (FAR 14.104 and FAR 16.102). The acquisition method selected for a particular acquisition may limit the available choice of contract type:

- **Simplified Acquisition.** When using simplified acquisition procedures purchase orders are normally firm fixed-price. You may use an unpriced order in certain situations when it is impossible to obtain firm pricing prior to issuing the purchase order. Whenever you use an unpriced order, the order must include a dollar limit on the Government's obligation and the contracting officer must follow-up to assure timely pricing.

- **Sealed Bidding.** When using sealed bidding procedures:
  - You will normally use a firm fixed-price contract.
  - You may use a fixed-price contract with economic price adjustment if the contracting officer determines (in writing) what type of contract is necessary to protect the contractor and the Government against significant fluctuations in labor or material costs or to provide for contract price adjustments in the event of changes in the contractor's established prices.
  - You must not use any other contract type.

- **Negotiation.** When using the negotiation procedures prescribed in FAR Part 15:
  - You may use any contract type or combination of contract types that will promote the best interests of the Government, as long as you meet the specific limitations in FAR Part 16.
  - You must not use any contract type not prescribed in the FAR unless authorized by agency regulation or a FAR deviation.

Consider Commerciality of the Requirement (FAR 12.207). When acquiring a commercial item:

- You normally should use a firm fixed-price contract.

- You may use a fixed-price contract with economic price adjustment if the contracting officer determines (in writing) what type of contract is necessary to protect the contractor and the Government against significant fluctuations in labor or material costs or to provide for contract price adjustments in the event of changes in the contractor's established prices.

- You must not use any other contract type in acquiring commercial items.

Consider Cost Risk. Encourage contractors to accept reasonable cost risks of contract performance. However, requiring contractors to accept unknown or uncontrollable cost risk can endanger contract performance, substantially reduce competition, and/or substantially increase contract price. To realistically choose the proper contract type to meet a specific contract situation, you must consider the proper allocation of cost risk.

Cost estimates, whether they are the offeror's proposed or the Government's recommended, are point estimates. In all contracts involving forward pricing, the point estimate is a projection of what the estimator believes is most likely to happen. Since things rarely happen exactly as predicted, there is usually some variation between projected and actual cost. The greater the potential variability between the projected and actual cost, the greater the cost risk.
Point Estimate
Small Variance

Lower Cost Risk
Quantitative analysis techniques can provide invaluable information about the distribution of values around the most likely future cost. For example, consider the confidence interval when your estimate is based on sampling analysis and the prediction interval when your estimate is based on regression analysis. However, use this information wisely. If the variance is large, attempt to determine why the interval is so large and what can be done to narrow it, before you select a contract type to share the risk. As a minimum, your appraisal of cost risk should consider two areas of particular concern, contract performance risk and market risk.

- Performance Risk. Most contract cost risk is related to contract requirements and the uncertainty surrounding contract performance. The lower the uncertainty the lower the risk. Therefore, your appraisal of cost risk should begin with an appraisal of performance risk. For larger more complex contracts, you will likely need assistance from other members of the Government Acquisition Team (e.g., representatives from the requiring activity, engineering staff, contracting, and program/project management).
Areas that you consider should include:

- Stability and clarity of the contract specifications or statement of work;
- Type and complexity of the item or service being purchased;
- Availability of historical pricing data;
- Prior experience in providing required supplies or services;
- Urgency of the requirement;
- Contractor technical capability and financial responsibility; and
- Extent and nature of proposed subcontracting.

The figure below depicts what happens as the contract requirement becomes better defined.

<table>
<thead>
<tr>
<th>COST RISK AND CONTRACT TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Risk</td>
</tr>
<tr>
<td>Requiemment Definition</td>
</tr>
<tr>
<td>Production Stages</td>
</tr>
<tr>
<td>Contract Type</td>
</tr>
</tbody>
</table>

- Performance risk should be reduced from a high to a relatively low level, as the requirement progresses from vague to well-defined and experience with the product increases.
  
  - Research and development contracts generally have a rather high performance risk. This is due to the factor of ill-defined requirements that arise from the necessity to deal beyond, or at least very near, the upper limits of current technology (i.e., "the state of the art").
  
  - Follow-on production contracts generally have a relatively low performance risk. Requirements are well known, there is a cost history to draw on, contractors have experience producing the product, etc.

- As performance risk changes, so should contract type. Note that cost-reimbursement, time & materials, or labor-hour contracts are generally associated with higher-risk requirements and fixed-price contracts are generally associated with lower-risk requirements.

- **Market Risk.** Changes in the marketplace will also affect contract costs. Preferred acquisition practice calls for forward pricing of contract efforts, because forward pricing provides a baseline
which you and the contractor can use to measure cost or price performance against contract effort.

- Forward pricing requires the contracting parties to make assumptions about future changes in the marketplace. A volatile market will increase the cost risk involved in contract pricing, particularly when the contract period will extend several years. What will material and labor cost two years from now? Will material shortages occur two years from now? In cases where these unknown costs are significant, contract period risk becomes an important consideration in selection of contract type.

- Fixed-price contracts with economic price adjustment, for example, are designed specifically to reduce this risk for contractors.

**Consider Appropriate Performance Incentives (FAR 16.103(b)).** Select the contract type (or combination of types) that will appropriately motivate contract performance.

  - When the risk involved is minimal or can be predicted with an acceptable degree of certainty, use a firm fixed-price contract, because it best utilizes profit to motivate efficient contract performance and cost control.

  - When there is no reasonable basis for firm pricing, consider other contract types. Using a firm fixed-price contract may limit competition, encourage inflated contract pricing, and efforts to control costs may actually hamper effective contract performance.

**Consider Accounting System Adequacy (FAR 16.104(h)).** Before agreeing on a contract type other than firm fixed-price, you must ensure that the contractor's accounting system will permit timely development of all necessary cost data in the form required for the proposed contract type. A careful account system review is particularly important when the contractor's only experience has been with firm fixed-price contracts. **Document the Selection Decision (FAR 16.103(d)).** Assure that the contract file contains documentation showing why the particular contract type was selected, unless you are:

  - Making a fixed-price acquisition using simplified acquisition procedures;

  - Using a firm fixed-price contract for any requirement other than major systems acquisition or research and development; or

  - Awarding the set-aside portion of a sealed bid partial set-aside for small business.

### 1.2 Utilizing Fixed-Price Economic Price Adjustment Contracts

This section will examine procedures for establishing a fixed-price economic price adjustment contract (FPEPA) and the procedures for making price adjustments using one type of FPEPA contract.

- **1.2.1 - Establishing Terms And Conditions For Economic Price Adjustment**

- **1.2.2 - Making An Economic Price Adjustment Using Cost Indexes**

**General Characteristics (FAR 16.203).** A fixed-price with economic price adjustment (FPEPA) contract is designed to cope with the economic uncertainties that threaten long-term fixed-price arrangements. The economic price adjustment (EPA) provisions provide for both price increases and decreases to protect the Government and the contractor from the effects of economic changes. **Situations for Use (FAR 16.203-2).** You may use an FPEPA contract in sealed bidding or negotiation when both of the following conditions exist:

  - There is serious doubt concerning the stability of market or labor conditions that will exist during an extended period of contract performance.

    - Volatility of the markets for labor and material. The more volatile the market, the greater the benefits that can be derived from FPEPA utilization.

    - Projected contract period. The longer the contract, the greater the contractor's exposure to an uncertain market. FPEPA contracts are normally not used for contracts that will be completed within six months of contract award.

    - The amount of competition expected. If markets are truly volatile, many firms may be
unwilling to submit an offer without EPA protection.

- Dollar value of the contract. The greater the cost risk to the contractor, the greater the benefits that can be derived from an FPEPA contract. In the DoD, adjustments based on actual labor or material cost are generally not used for contracts of $50,000 or less (DFARS 216.203-4(c)).

- Contingencies that would otherwise be included in the contract price can be identified and covered separately in the contract.

Limitations on Use (FAR 16.203-3). You must not use an FPEPA contract unless you have determined that it is necessary for one of the following reasons.

- To protect the contractor and the Government against significant fluctuations in labor or material costs.
- To provide for contract price adjustment in the event of changes in the contractor’s established prices.

1.2.1 Establishing Terms And Conditions For Economic Price Adjustment

Establishing the Base for Adjustment (FAR 16.203-2). When establishing a base for adjustment, ensure that contingency allowances are not duplicated by inclusion in both the base price and the adjustment requested by the contractor under the EPA provision. If you do not require cost or pricing data, obtain adequate information to establish the base level from which adjustment will be made. If necessary, you may require verification of the data submitted. EPA Clauses in Negotiated Contracts (FAR 16.203-4). The key provision in an FPEPA contract is the EPA clause. FAR identifies the four types of economic price adjustment presented in the table below. In developing an FPEPA contract, you can choose from the FAR EPA clauses, use an agency-prescribed clause, or develop your own unique clause following agency guidelines. For commercial items, consider market research and commercial practice in clause development.

<table>
<thead>
<tr>
<th>When you are contracting by negotiation and an FPEPA contract is appropriate:</th>
<th>• Consider adjustment based on:</th>
<th>• When the following requirements are met:</th>
<th>• And adjustment can follow the requirements of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Established Prices for Standard Supplies</td>
<td>• A fixed-price contract is contemplated.</td>
<td>• Economic Price Adjustment-Standard Supplies (FAR 52.216-2); or</td>
<td>• An agency-prescribed EPA clause if you determine that use of the above provision is inappropriate (e.g., DFARS 252.216-7000, Economic Price Adjustment-Basic Steel,</td>
</tr>
<tr>
<td>Establish Prices of Semistandard Supplies</td>
<td>Economic Price Adjustment-Semistandard Supplies [(FAR 52.216-3); or]</td>
<td>Actual Cost of Labor or Material</td>
<td>Economic Price Adjustment-Labor and Material [(FAR 52.216-4); or]</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>- A fixed-price contract is contemplated.</td>
<td>- An agency-prescribed EPA clause if you determine that use of the above provision is inappropriate.</td>
<td>- A fixed-price contract is contemplated.</td>
<td>- An agency-prescribed EPA clause if you determine that use of the above provision is inappropriate (e.g., DFARS [252.216-7001], Economic Price</td>
</tr>
<tr>
<td>- The contract is for semistandard supplies with prices that can be reasonably related to the prices of nearly equivalent standard supplies with an established catalog or market price.</td>
<td></td>
<td>- No major design engineering or development is involved.</td>
<td></td>
</tr>
<tr>
<td>- If the contract unit price reflects a net price after applying a trade discount from a catalog or list price, you can document both the catalog or list price and the discount.</td>
<td></td>
<td>- One or more identifiable labor or material cost factors is subject to change.</td>
<td></td>
</tr>
<tr>
<td>- Before contract award, you must reach agreement in writing with the contractor on the identity of the standard item related to each line item.</td>
<td></td>
<td>- The contract Schedule must describe in detail:</td>
<td></td>
</tr>
<tr>
<td>- <strong>Note:</strong> If the supplies are standard, except for preservation, packaging, and packing, use the Standard Supplies provision, above.</td>
<td></td>
<td>- Types of labor and materials subject to adjustment under the provision.</td>
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</tbody>
</table>
labor and materials allocable to each unit to be delivered under the contract.

- When negotiating adjustments under the contract, you must be able to:
  - Consider work in process and materials on hand at the time of changes in labor rates, including fringe benefits.
  - Not adjust any indirect costs except fringe benefits.
  - Consider only fringe benefits specified in the contract Schedule.

- Price/Cost Indexes for Labor or Material
- The contract involves an extended performance period with significant costs beyond one year.
  - Contract amount subject to adjustment is substantial.
  - Labor and material prices are too unstable to permit reasonable division of risk between the contractor and the Government without an EPA clause.

- EPA Provisions in Sealed Bidding (FAR 14.408-4). In sealed bidding, you cannot negotiate the terms of an EPA clause. When you prepare the invitation for bids (IFB), the contract clause must be established in a way that is compatible with the requirements of the sealed bidding process.

<table>
<thead>
<tr>
<th>When an IFB contains an economic price adjustment clause and...</th>
<th>Then...</th>
</tr>
</thead>
<tbody>
<tr>
<td>No bidder takes exception to the clause</td>
<td>Evaluate bids on the basis of the quoted prices without adding the allowable EPA.</td>
</tr>
<tr>
<td>A bidder increases the maximum percentage of EPA stipulated in the invitation or limits the downward EPA provisions of the IFB</td>
<td>Reject the bid as nonresponsive.</td>
</tr>
<tr>
<td>A bid deletes the EPA clause</td>
<td>Reject the bid as nonresponsive because downward adjustment is limited by the deletion.</td>
</tr>
</tbody>
</table>
- A bidder decreases the maximum percentage of EPA stipulated in the invitation
  - Evaluate bids at the base price.
  - If the bidder with the reduced ceiling is in position to receive award, the award must reflect the lower ceiling.

- When an IFB does not contain an economic price adjustment clause, but a bidder proposes one...
  - Then...

- With a ceiling that the price will not exceed
  - Evaluate the bid on the basis of the maximum possible EPA of the quoted price.
  - If the bid is eligible for award, request the bidder to agree to the inclusion in the contract of an approved EPA clause subject to the same ceiling.
  - If the bidder will not agree to an approved clause, award may be made based on the original bid.

- Without a ceiling that the price will not exceed
  - Reject the bid unless there is a clear basis for evaluation.

*Developing an EPA Clause Based on Cost Indexes (DFARS 216.203-4).* When you develop an EPA clause based on cost indexes for labor or material, the clause must be prepared and approved in accordance with agency procedures. Assure that the clause:

- Is not unnecessarily complex.
- Accurately identifies the index(es) which will be used in making adjustments:
  - Normally, you should not use more than two indexes, one for labor (direct and indirect) and one for material (direct and indirect).
  - The index should encompass a large sample of relevant items while still bearing a logical relationship to the type of contract costs being adjusted.
  - Commonly used indexes include the following series published by the U.S. Department of Labor, Bureau of Labor Statistics (BLS):
    - Producer Price Index for industrial commodities.
    - Employment Cost Index for wages and salaries, benefits, and compensation costs for aerospace industries.
    - Wages and Income Series by Standard Industrial Classification (SIC).
  - If no single index relates directly to the costs to be adjusted, you may need to develop a composite index.
- Clearly identifies a base index period comparable to the base contract period for adjustment.
- Clearly identifies events that will trigger price adjustments.
  - Adjustments should be frequent enough to afford the contractor appropriate economic protection without creating a burdensome administrative effort.
Normally, the adjustment period should range from quarterly to annually.

- States the percentage of the base price that is subject to adjustment. Normally, you should:
  - Not apply adjustments to the profit portion of contract price. Obtain adequate information from the contractor and other sources to assure that the baseline is reasonable.
  - Exclude any areas of cost that do not require adjustment, such as firm fixed-price subcontracts, areas of overhead that should remain relatively stable (e.g., depreciation), labor costs covered by a union agreement, and other costs not likely to be affected by changes in the economy.
  - Allocate the portions of contract price subject to adjustment to specific periods of time (e.g., quarterly) based on the most probable pattern of expenditure or commitment (expenditure profile).
  - State that the portion of contract price subject to adjustment must not be modified except in the event of significant changes in contract scope.

- Reasonably provides for potential economic fluctuations within the original contract period, including options. Do not provide for an adjustment beyond the original contract period, including options.

- Clearly identifies any limits on adjustment, ceiling on upward adjustments or floor on downward adjustments. Normally, you should not include a ceiling or a floor for adjustment unless the adjustment is based on indexes below the four digit level of the BLS indexes identified above.

- Clearly identifies any minimum change required to trigger adjustment. For example, the contract could state that, "No adjustment will be made unless the index indicates a price change of 2 percent or more from base period prices. However, if the index does indicate an increase or decrease of more than 2 percent, the adjustment will consider the full amount of the change for the portion of contract price indicated in the contract."

- Clearly identifies any requirement for the prime contractor to extend EPA coverage to subcontractors to assure a proper allocation of risk.

- Clearly states how EPA adjustments will be considered in applying any cost incentives included in the contract. Normally, a contract which includes a cost incentive provision should provide that any sums paid to the contractor because of EPA provisions must be subtracted from the total allowable costs, for the purpose of establishing the total costs to which the provision applies.

- Clearly state how the pricing of contract modifications will be affected by the EPA provisions. Normally, modifications are priced as though the EPA provision did not exist.

### 1.2.2 Making An Economic Price Adjustment Using Cost Indexes

*Steps for Making an Economic Price Adjustment.* When you have developed and awarded an FPEPA contract based on cost index(es), you must administer the EPA provisions as presented in the contract. In general, the adjustment process will follow a 5-step procedure: **Step 1. Identify the index(es) which will be used in making adjustments.**  
**Step 2. Identify the base period and times or events that will trigger price adjustments.**  
**Step 3. Identify the percentage of the base price subject to adjustment.**  
**Step 4. Identify any limits on adjustment.**  
**Step 5. Calculate the adjusted price.**

\[
\text{Adjusted Unit Price} = \left[ \frac{I_2}{I_1} \times S(P) \right] + \left[ (1 - S)(P) \right]
\]

Where: 
- \( I_1 \) = Index for Base Period
- \( I_2 \) = Index for Adjustment Period
- \( S \) = Percentage of Price Subject to
Adjustment\(P = \text{Base Unit Contract Price}\)Example of an Economic Price Adjustment. The following example demonstrates the application of the above steps in making a contract price adjustment for a manufactured item. In the example, an EPA clause was included in the contract, awarded in December 20X1, for deliveries during calendar year 20X2. An estimated 25 percent of the contract price is related to the market price of silver and fluctuations in the market make it extremely difficult to estimate costs over the next year.

**Step 1.** Identify the index(es) which will be used in making adjustments. The contract states that price adjustments will be made using the Producer Price Index (PPI) for "silver bar, refined, .999 fine" (PPI 1022-0272).

**Step 2.** Identify the base period and times or events that will trigger price adjustments. The contract provides for adjustment consideration using the April 20X2 index for scheduled second quarter deliveries, the July 20X2 index for scheduled third quarter deliveries, and the October 20X2 index for scheduled fourth quarter deliveries. The base period for adjustment purposes is December 20X1. The calculation presented below is for the 5,000 units scheduled for delivery during the second quarter of 20X2.

**Step 3.** Identify the percentage of the base price subject to adjustment. The EPA clause states that 25 percent of the contract unit price is subject to adjustment. The unadjusted contract unit price is $200 per unit. That means that $50 of the unit price is subject to adjustment and $150 is not.

**Step 4.** Identify any limits on adjustment. Because of the extreme volatility of the silver market, the EPA clause does not include a limit on any adjustment.

**Step 5.** Calculate the adjusted price. Adjust the price using the index for April 20X2 when:

\[ I_1 = \text{Index for Base Period} = 45.0 \text{ in December 20X1} \]
\[ I_2 = \text{Index for Adjustment Period} = 67.5 \text{ in April 20X2} \]
\[ S = \text{Percentage of Price Subject to Adjustment} = 25\% \]
\[ P = \text{Base Unit Contract Price} = \$200 \]

The adjusted unit price is calculated as follows:

\[
\text{Adjusted Unit Price} = \left[ \frac{I_2}{I_1} x S(P) \right] + \left[ (1 - S)(P) \right]
\]

\[
= \left[ \frac{67.5}{45.0} x .25(\$200) \right] + \left[ (1 - .25)(\$200) \right]
\]

\[
= (1.50 \times \$50) + \$150
\]

\[
= \$75 + \$150
\]

\[
= \$225
\]

The total price for the 5,000 units scheduled for delivery during the second quarter is $1,125,000. The economic price adjustment is a $125,000 increase.

### 1.3 Structuring And Applying Incentive Pricing Arrangements

This section examines procedures for structuring and applying incentive pricing arrangements.

- **1.3.1 - Structuring A Cost Incentive Pricing Arrangement**

- **1.3.2 - Applying A Cost Incentive Pricing Arrangement**

**General Characteristics (FAR 16.401 and FAR 16.402).** Incentive contracts are designed to attain specific acquisition objectives by positively rewarding identified contractor achievements exceeding stated target(s) and negatively rewarding contractor failures to attain stated targets. Profit/fee will increase when target(s) are surpassed. They will decline when target(s) are not achieved. Changes in profit/fee will follow an agreed-to formula-type incentive arrangement. Contracts may include:

- **Cost Incentives.** Most incentive contracts include only an incentive for controlling cost. You cannot provide for other incentives without also providing a cost incentive or constraint.

- **Performance Incentives.** Consider technical performance incentives in connection with specific product characteristics or other specific elements of contract performance. When a variety of specific characteristics contribute to the overall contract performance, you must balance the incentives so that no one of them is exaggerated to the detriment of overall contract performance.
• **Delivery Incentives.** Consider delivery incentives when improvement from a required delivery schedule is a significant Government objective. Delivery incentives should specify the application of the incentive structure in the event of delays beyond the control and without the fault or negligence of the contractor or subcontractor.

If you use multiple incentives, structure them in a manner that compels trade-off decisions among the incentive areas. Be careful to avoid using too many incentives. If there are too many incentives, it may be impossible for the contractor to logically consider the trade-offs available and determine the effect on profit/fee. **Types of Incentive Contracts** *(FAR Subpart 16.4).* There are three types of incentive contracts that provide for changes in profit/fee following an agreed-to formula-type incentive arrangement: the fixed-price incentive firm target (FPIF); fixed-price incentive successive targets (FPIS); and cost-plus-incentive-fee (CPIF). Because the FPIF and CPIF contracts are used much more frequently than FPIS contracts, the remainder of this section will concentrate on the development of those pricing arrangements. There are two other incentive contracts described in the FAR -- the cost-plus-award-fee (CPAF) contract and the fixed-price contract with award fee (FPAF). These contract types are not examined in this section, because award-fee incentives are not based on any type of formula arrangement. They are examined in a later section of the chapter. **Situations for FPIF Contract Use** *(FAR 16.403 and FAR 16.403-1(b)).* An FPIF contract is appropriate when:

- A firm fixed-price contract is not suitable;
- The nature of the supplies or services being acquired and other circumstances of the acquisition are such that the contractor's assumption of a degree of cost responsibility will provide a positive profit incentive for effective cost control and performance;
- The parties can negotiate (at the outset) a firm target cost, target profit, and profit adjustment formula that will provide a fair and reasonable incentive and a ceiling that provides for the contractor to assume an appropriate share of the risk.
- If the contract also includes incentives on technical performance and/or delivery, the performance requirements provide a reasonable opportunity for the incentives to have a meaningful impact on the contractor's management of the work.
- **Limitations on FPIF Contract Use (FAR 16.403-1(c)).** Do not use an FPIF contract unless:
  - The contractor's accounting system is adequate for providing data to support negotiation of final cost and incentive price revision; and
  - Adequate cost or pricing information is available for establishing reasonable firm targets at the time of initial contract negotiation.

**Situations for CPIF Contract Use** *(FAR 16.405-1(b)).* A cost-plus-incentive-fee contract is appropriate for noncommercial service or development and test programs when:

- A cost-reimbursement contract is necessary;
- The parties can negotiate a target cost and a fee adjustment formula that are likely to motivate the contractor to manage effectively.
  - The fee adjustment formula should provide an incentive that will be effective over the full range of reasonably foreseeable variations from target cost.
  - If a high maximum fee is negotiated, the contract shall also provide for a low minimum fee that may be a zero fee or, in rare cases, a negative fee
- The contract may include technical performance incentives when it is highly probable that the required development of a major system is feasible and the Government has established its performance objectives, at least in general terms.

**Limitations on CPIF Contract Use (FAR 16.405-1(c)).** Do not use a CPIF contract unless:

- The contractor's accounting system is adequate for determining costs applicable to the contract; and
- Appropriate Government surveillance during performance will provide reasonable assurance that
efficient methods and effective cost controls are used.

1.3.1 Structuring A Cost Incentive Pricing Arrangement

*Basic Elements of Incentive Arrangement (FAR 16.402-1(b)).* The basic elements of the cost incentives in CPIF contracts and the FPIF contracts are compared in the table below. Note that the first three elements are similar for both contract types.

<table>
<thead>
<tr>
<th>Contract Elements</th>
<th>FPIF Contract</th>
<th>CPIF Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Target Cost</td>
<td>Target Cost</td>
<td>Target Cost</td>
</tr>
<tr>
<td>• Target Profit</td>
<td>Target Profit</td>
<td>Target Profit</td>
</tr>
<tr>
<td>• Profit Adjustment Formula</td>
<td>Profit Adjustment Formula</td>
<td>Fee Adjustment Formula</td>
</tr>
<tr>
<td>• Price Ceiling</td>
<td>Price Ceiling</td>
<td>Minimum Fee</td>
</tr>
</tbody>
</table>

*Target Cost.* Both FPIF contracts and CPIF contracts have a target cost. If the contractor completes the contract at the target cost, there will be no positive or negative cost incentives applied. What is a good target cost? The target cost should be the most likely contract cost. You and the contractor must reach agreement on target cost based on judgment and the facts available at the time of contract negotiation.

*Target Profit/Fee.* Profit is the difference between cost and price for the FPIF contract. Fee is the difference between cost and price in the CPIF contract. Target profit/fee is the difference between cost and price at target cost. Your profit/fee objective should be based on the results of your analysis using your agency's structured approach to profit/fee analysis.

*Profit/Fee Adjustment Formula.* The profit adjustment formula of the FPIF contract and fee adjustment formula of the CPIF contract have a similar purpose -- to adjust profit/fee as cost increases or decreases. A single contract can have one adjustment formula for all levels of cost or there may be more than one (e.g., one above target cost and one below target cost). The adjustment formula represents the allocation of cost risk between the Government and the contractor. The adjustment formula is normally described as a share ratio written as: $S_G/S_C$ Where: $S_G =$ Percentage of cost risk assumed by the Government $S_C =$ Percentage of cost risk assumed by the contractor. The two parts $(S_G + S_C)$ of the ratio must always total 100 percent of the cost risk (e.g., 70/30). A 70/30 share ratio means that the Government accepts 70 percent of the cost risk and the contractor accepts 30 percent. A 60/40 share ratio means that the Government accepts 60 percent of the cost risk and the contractor accepts 40 percent.

*Steps for Developing an Adjustment Formula.* You should develop the contract adjustment formula based on an analysis of the reasonable changes in profit/fee over the range of probable costs. Consider the following steps as you develop the share ratio for adjustment calculations:

1. **Step 1. Develop a target cost objective as described above.**
2. **Step 2. Develop a target profit/fee objective as described above.**
3. **Step 3. Develop a pessimistic cost estimate.** The target cost is only one cost in the range of reasonable costs. The pessimistic cost should be an estimate of the highest cost that you would consider probable based on the information available at the time of contract negotiation.
   - Quantitative analysis techniques can provide invaluable information for you to use in estimating the pessimistic cost. For example, consider the high side of the confidence interval when your estimate is based on sampling analysis and the high side of the prediction interval when your estimate is based on regression analysis.
      - If the pessimistic cost is very high relative to the estimate, the risk may be too great for an incentive contract. You may need to consider another contract type (e.g., a cost-plus-fixed-fee contract).
   - **Step 4. Develop an estimate of an appropriate profit/fee if costs reached the pessimistic cost estimate.** In your analysis, consider the target profit/fee objective and the quality of contractor effort required to limit costs to the pessimistic cost estimate.
4. **Step 5. Develop an optimistic cost estimate.**
The optimistic cost should be an estimate of the lowest cost that you would consider probable based on the information available at the time of contract negotiation.

- Quantitative analysis techniques can provide invaluable information for you to use in estimating the optimistic cost. For example, consider the low side of the confidence interval when your estimate is based on sampling analysis and the low side of the prediction interval when your estimate is based on regression analysis.

- There is no reason that the difference between target cost and the optimistic cost must be equal to the difference between target cost and pessimistic cost. If fact, the two will normally not be equal.

**Step 6. Develop an estimate of an appropriate profit/fee if costs were limited to the optimistic cost estimate.** In your analysis, consider the target profit/fee objective and the quality of contractor effort required to limit costs to the optimistic cost estimate. **Step 7. Calculate the under-target share ratio.**

- Calculate contractor share. Use the following formula to calculate the contractor’s percentage share of cost risk:

\[
S_{CU} = \left( \frac{P_T - P_O}{C_T - C_O} \right) \times (-100)
\]

Where:
- \( S_{CU} \) = Contractor percentage share of cost risk (This will be a negative number, indicating that profit/fee will go up as costs go down.)
- \( P_T \) = Target profit/fee
- \( P_O \) = Profit/fee at optimistic cost estimate
- \( C_T \) = Target cost
- \( C_O \) = Optimistic cost estimate

- Calculate Government share. Calculate the Government share of cost risk by subtracting the contractor share from 100 percent:

\[
S_{GU} = 100\% - S_{CU}
\]

Where:
- \( S_{GU} \) = Government percentage share of cost rise
- \( S_{CU} \) = Contractor percentage share of cost rise

- Write the under-target share ratio in the form \( S_{GU} / S_{CU} \).

Step 8. Calculate the over-target share ratio.

- Contractor share. Use the following formula to calculate the contractor’s percentage share of cost risk:

\[
S_{CO} = \left( \frac{P_T - P_P}{C_T - C_P} \right) \times (100)
\]

Where:
- \( S_{CO} \) = Contractor percentage share of cost risk (This will be a negative number, indicating that profit/fee will go up as costs go down.)
- \( P_T \) = Target profit/fee
- \( P_P \) = Profit/fee at pessimistic cost estimate
- \( C_T \) = Target cost
- \( C_P \) = Pessimistic cost estimate

- Government share. Calculate the Government share of cost risk by subtracting the contractor share from 100 percent:

\[
S_{GO} = 100\% - S_{CO}
\]

Where:
- \( S_{GO} \) = Government percentage share of cost risk
- \( S_{CO} \) = Contractor percentage share of cost risk

- Write the over-target share ratio in the form \( S_{GO} / S_{CO} \).

**Example of Sharing Arrangement Formula Development.** You have analyzed a contractor’s proposal considering all available information. As a result of your analysis, you have completed Steps 1 through 6 of adjustment formula development and prepared the three positions presented in the table below. You must now use this information to calculate the under target and over-target share ratios.

<table>
<thead>
<tr>
<th>Prenegotiation Estimates</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Element</th>
<th>Optimistic</th>
<th>Most Likely (Target)</th>
<th>Pessimistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material</td>
<td>$250,000</td>
<td>$300,000</td>
<td>$320,000</td>
</tr>
<tr>
<td>Cost</td>
<td>$320,000</td>
<td>$400,000</td>
<td>$600,000</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>$230,000</td>
<td>$300,000</td>
<td>$380,000</td>
</tr>
<tr>
<td>Cost</td>
<td>$800,000</td>
<td>$1,000,000</td>
<td>$1,300,000</td>
</tr>
<tr>
<td>Indirect Cost</td>
<td>$150,000</td>
<td>$100,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$950,000</td>
<td>$1,100,000</td>
<td>$1,310,000</td>
</tr>
<tr>
<td>Profit/Fee</td>
<td>$320,000</td>
<td>$600,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Total Price</td>
<td>$1,100,000</td>
<td>$1,310,000</td>
<td>$1,310,000</td>
</tr>
</tbody>
</table>

Step 7. Calculate the under-target share ratio.
- Contractor share.

\[ S_{CO} = \frac{(P_T - P_P)}{(C_T - C_P)} \times -100 \]
\[ = \frac{($100,000 - $150,000)}{($1,000,000 - $800,000)} \times -100 \]
\[ = \frac{-$500,000}{-$200,000} \times -100 \]
\[ = 25\% \]
- Government share.

\[ S_{GU} = 100\% - S_{CU} \]
\[ = 100\% - 25\% \]
\[ = 75\% \]
- Write the under-target share ratio as 75/25.

Step 8. Calculate the over-target share ratio.
- Contractor share.

\[ S_{CO} = \frac{(P_T - P_P)}{(C_T - C_P)} \times -100 \]
\[ = \frac{($100,000 - $10,000)}{($1,000,000 - $1,300,000)} \times -100 \]
\[ = \frac{$90,000}{-$300,000} \times -100 \]
\[ = 30\% \]
- Government share.

\[ S_{GO} = 100\% - S_{CO} \]
\[ = 100\% - 30\% \]
\[ = 70\% \]
- Write the over-target share ratio as 70/30. Note that the over-target share ratio and the under-target share ratio are not the same. That is not unusual.

**Final Steps for Developing a CPIF Arrangement.** As you learned above, the basic elements of the CPIF contract and the FPIF contract are quite similar. Both have a target cost. CPIF target fee and FPIF target profit are both developed using structured profit/fee analysis. Both have sharing arrangements for costs over and under target.

The differences between the CPIF and FPIF pricing arrangements occur when contract costs are substantially above or below target cost. The CPIF contract pricing arrangement must include a minimum fee and a maximum fee that define the contract range of incentive effectiveness (RIE). When costs are above or below the RIE, the Government assumes full cost risk for each additional dollar spent within the funding or cost limits established in the contract. Consider the following final steps when developing a CPIF pricing arrangement.
Step 9. Set the minimum fee. No matter what fee you calculate using the share ratio, the contractor’s actual fee cannot be less than the minimum fee stated in the contract. In effect, you are telling the contractor that the Government will accept the risk of contract cost exceeding the cost at the point where minimum fee is reached.

- The pricing arrangement should be structured so that the minimum fee is reached at the pessimistic cost estimate.
- The minimum fee may be zero, but it should rarely be less than zero.

Step 10. Set the maximum fee. No matter what fee you calculate using the share ratio, the contractor’s actual fee cannot be more than the maximum fee stated in the contract. Logically, the pricing arrangement should be structured so that the maximum fee is reached at the optimistic cost estimate.

Example of CPIF Arrangement Development. Use the proposal analysis in the following table to develop a contract pricing arrangement including: target cost, target fee, under-target share ratio, over-target share ratio, maximum fee, and minimum fee.

<table>
<thead>
<tr>
<th>CPIF Contract Prenegotiation Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
</tr>
<tr>
<td>Direct Material Cost</td>
</tr>
<tr>
<td>Direct Labor Cost</td>
</tr>
<tr>
<td>Cost</td>
</tr>
<tr>
<td>Indirect Cost</td>
</tr>
<tr>
<td>Fee</td>
</tr>
<tr>
<td>Total Cost</td>
</tr>
<tr>
<td>Total Price</td>
</tr>
</tbody>
</table>

Steps 1-6 have been completed in the table above. Note that:

- Target cost should be the most likely cost -- $1,000,000
- Target fee -- the $70,000 in the "Most Likely Cost" column in above table -- was developed using structured fee analysis.

Step 7. Calculate the under-target share ratio.

- Contractor share.

\[ S_{CU} = \frac{(P_T - P_D)}{(C_T - C_O)} \times (-100) \]
\[ = \frac{($70,000 - $120,000)}{($1,000,000 - $800,000)} \times (-100) \]
\[ = \frac{-$50,000}{-$200,000} \times (-100) \]
\[ = 25\% \]
- Government share.

\[ S_{GU} = 100\% - S_{CU} \]
\[ = 100\% - 25\% \]
\[ = 75\% \]
- Write the under-target share ratio as 75/25.

Step 8. Calculate the over-target share ratio.

- Contractor Share.

\[ S_{CO} = \frac{(P_T - P_P)}{(C_T - C_F)} \times (-100) \]
\[ = \frac{($70,000 - $20,000)}{($1,000,000 - $1,400,000)} \times (-100) \]
\[ = \frac{$50,000}{-$400,000} \times (-100) \]
\[ = 12.5\% \]
- Government Share.

\[ S_{GO} = 100\% - S_{CO} = 100\% - 12.5\% = 87.5\% \]

- Write the over-target share ratio as 87.5/12.5.

**Step 9. Set the minimum fee.** Minimum fee should be the fee at the pessimistic cost. That fee is $20,000.

**Step 10. Set the maximum fee.** Maximum fee should be the fee at the optimistic cost. That fee is $120,000.

**CPIF Range of Incentive Effectiveness.** Whenever you develop a CPIF pricing arrangement, assure that you know the range over which the cost incentives are effective. The range of incentive effectiveness (RIE) is the range over which CPIF incentives can be expected to motivate contractor performance. The RIE is not identified in the contract, but it is defined by the share ratio(s), minimum fee, and maximum fee. The cost incentive will be effective in the range between the cost point where the maximum fee is reached and the cost point where the minimum fee is reached -- the range between the optimistic cost estimate and the pessimistic cost estimate. Beyond these points, the contractor has no contract incentive to control cost, because fee is fixed.

In the example above, we developed the following pricing arrangement.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Cost</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Target Fee</td>
<td>$70,000</td>
</tr>
<tr>
<td>Under-Target Share Ratio</td>
<td>75/25</td>
</tr>
<tr>
<td>Over-Target Share Ratio</td>
<td>87.5/12.5</td>
</tr>
<tr>
<td>Maximum Fee</td>
<td>$120,000</td>
</tr>
<tr>
<td>Minimum Fee</td>
<td>$20,000</td>
</tr>
</tbody>
</table>

The range of incentive effectiveness would be between the optimistic cost ($800,000) and the pessimistic cost ($1,400,000) as shown in the figure below:
CPIF Pricing Arrangement. Note that the optimistic cost estimate and pessimistic cost estimate used to develop the pricing arrangement are not given in the terms of the pricing arrangement. If a contractor had presented an offer which included the elements above, you could calculate the offer RIE by using the following formulas to calculate the optimistic cost and pessimistic cost:

\[
C_O = C_T - \frac{(P_O - P_T)}{S_{CU}}
\]

\[
C_P = C_T - \frac{(P_T - P_F)}{S_{CO}}
\]

Where:
- \(C_O\) = Optimistic cost
- \(C_T\) = Target cost
- \(P_T\) = Target fee
- \(P_O\) = Maximum fee (fee at the optimistic cost)
- \(P_F\) = Minimum fee (fee at the pessimistic cost)
- \(S_{CU}\) = Contractor under-target share
- \(S_{CO}\) = Contractor over-target share

**Example of Calculating CPIF Range of Incentive Effectiveness.** We can use the pricing arrangement above to calculate the optimistic and pessimistic costs used to develop the pricing arrangement.

Step 1. Calculate the optimistic cost that is consistent with the pricing arrangement.

\[
C_O = C_T - \frac{(P_O - P_T)}{S_{CU}}
\]

\[
= \frac{1,000,000 - (120,000 - 70,000)}{25\%}
\]

\[
= \frac{1,000,000 - 50,000}{25\%}
\]

\[
= \frac{1,000,000 - 200,000}{25\%}
\]

\[
= 800,000
\]

$800,000 is the optimistic cost estimate. Note that is the number we used in developing the pricing arrangement.
Step 2. Calculate the pessimistic cost that is consistent with the pricing arrangement.

\[ C_o = C_t - (P_o - P_t) / S_{CU} \]

\[ = $1,000,000 + ($70,000 - $20,000) / 12.5\% \]
\[ = $1,000,000 + $50,000 / 12.5\% \]
\[ = $1,000,000 + $400,000 \]
\[ = $1,400,000 \]

$1,400,000 is the pessimistic cost estimate (Note that is the number we used in developing the pricing arrangement.)

Step 3. Use the calculated optimistic cost and the pessimistic cost to describe the RIE. The RIE in this example would be $800,000 to $1,400,000. Outside that range, the proposed incentive arrangement would not incentivize the contractor to control costs.

Final Steps for Developing a FPIF Arrangement. The FPIF contract does not have a maximum profit, the share ratio remains in effect throughout the range of under-target costs. Instead of a minimum profit, the FPIF contract must include a ceiling price. If costs exceed the ceiling price, the contractor assumes full cost risk for each additional dollar spent. Accordingly, the final step in developing a FPIF pricing arrangement is:

Step 9. Set ceiling price. No matter what profit you calculate using the share ratio, the actual price cannot exceed the ceiling price stated in the contract. Logically, the pricing arrangement should be structured so that the ceiling price is reached when contract cost reaches the pessimistic cost estimate. Accordingly, the ceiling price is equal to the pessimistic cost estimate plus estimated profit at that cost.

- Example of FPIF Arrangement Development. Use the proposal analysis in the following table to develop a contract pricing arrangement including: target cost, target profit, under-target share ratio, over-target share ratio, and ceiling price.

<table>
<thead>
<tr>
<th>FPIF Contract Prenegotiation Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
</tr>
<tr>
<td>Direct Material Cost</td>
</tr>
<tr>
<td>Direct Labor Cost</td>
</tr>
<tr>
<td>Indirect Cost</td>
</tr>
<tr>
<td>Total Cost</td>
</tr>
<tr>
<td>Profit</td>
</tr>
<tr>
<td>Total Price</td>
</tr>
</tbody>
</table>

Steps 1-6 have been completed in the table above. Note that:

- Target cost should be the most likely cost, $1,000,000
- Target profit -- the $100,000 in the “Most Likely Cost” column in above table -- was developed using structured profit analysis.

Step 7. Calculate the under-target share ratio.

- Contractor share.

\[ S_{CU} = (P_t - P_o) / (C_t - C_o) \times (-100) \]
\[ = ($100,000 - $150,000) / ($1,000,000 - $800,000) \times (-100) \]
\[ = -$50,000 / $200,000 \times (-100) \]
Government share.

\[ S_{GU} = 100\% - S_{CU} \]
\[ = 100\% - 25\% \]
\[ = 75\% \]

- Write the under-target share ratio as 75/25.

Step 8. Calculate the over-target share ratio.

Contractor Share.

\[ S_{CO} = \frac{(P_T - P_P)}{(C_T - C_P)} \times (-100) \]
\[ = \frac{($100,000 - $25,000)}{($1,000,000 - $1,300,000)} \times (-100) \]
\[ = \frac{75,000}{-300,000} \times (-100) \]
\[ = 25\% \]

- Government Share.

\[ S_{GO} = 100\% - S_{CO} \]
\[ = 100\% - 25\% \]
\[ = 75\% \]

- Write the over-target share ratio as 75/25.

Note that for this contract, the over-target and under-target share ratios happen to be the same, but the range of dollars between target cost and the pessimistic estimate of probable cost is much larger than the range of dollars between the target cost and the optimistic estimate of probable cost.

Step 9. Set Ceiling Price. The ceiling price should be structured so that the ceiling price is reached when contract cost reaches the pessimistic cost estimate. Accordingly, the ceiling price is equal to the pessimistic cost estimate ($1,300,000) plus the estimated $25,000 profit at that cost. Accordingly, the ceiling price is $1,325,000.

FPIF Point of Total Assumption. Whenever you discuss a FPIF pricing arrangement, assure that you identify the point of total assumption (PTA). The PTA is the cost at which the contractor assumes total responsibility for each additional dollar of contract cost. This point is not identified in the contract, but it is defined by the target price, target cost, over-target share ratio, and ceiling price. The PTA can be found mathematically using the following formula:

\[ PTA = K_C - K_T / S_G + C_T \]

Where:
- PTA = Point of total assumption
- \( K_C \) = Ceiling price
- \( K_T \) = Target price
- \( C_T \) = Target cost
- \( S_G \) = Government percentage share of cost risk

For the example above, the calculations would be:

\[ PTA = $1,325,000 - $1,100,000 / 75\% + $1,000,000 \]
\[ = $225,000 / 75\% + $1,000,000 \]
\[ = $300,000 + $1,000,000 \]
\[ = $1,300,000 \]

Note that the PTA is equal to the cost at the pessimistic cost estimate. After the contract cost reaches $1,300,000, each additional dollar of cost comes from profit. When cost exceeds the $1,325,000 ceiling price, each additional dollar of cost increases the loss (negative profit) on the contract.

The figure below depicts the FPIF pricing arrangement developed above, including the PTA:
1.3.2 Applying A Cost Incentive Pricing Arrangement

Incentive Contracts and Final Pricing. With incentive contracts, contract pricing does not end with establishing the incentive pricing arrangement. This section will examine the application of the incentive pricing arrangement to calculate final contract price.

Final Steps for Developing a FPIF Arrangement. The FPIF contract does not have a maximum profit, the share ratio remains in effect throughout the range of under-target contractor's share of any costs over or under target as calculated in Step 3.

Steps for CPIF Contract Final Pricing (FAR 52.216-10(e)(4)). Cost-reimbursement contracts provide for payment of allowable incurred costs, to the extent prescribed in the contract. In a CPIF contract, final fee will depend on the allowable cost incurred.

Follow the steps below in calculating final contract price.

Step 1. Calculate final allowable contract cost. Base calculations on the contractor’s final vouchers, Government audit results, and other available information. Exclude all costs specifically identified as unallowable.

Step 2. Determine final cost for fee adjustment purposes. For the purposes of fee adjustment, do not include costs arising from:

- Any of the causes covered by the contract Excusable Delays clause to the extent that the costs are beyond the control and without the fault or negligence of the contractor or any subcontractor.
- The taking effect, after target cost negotiation, of a statute, court decision, written ruling, or regulation that results in the contractor’s being required to pay or bear the burden of any tax or duty or rate increase in a tax or duty;
- Any direct cost attributed to the contractor’s involvement in litigation as required by the contracting officer pursuant to contract requirements, including furnishing evidence and information requested pursuant to the contract Notice and Assistance Regarding Patent and Copyright Infringement clause;
- The purchase and maintenance of additional insurance not in the target cost and required by the contracting officer, or claims for reimbursement for liabilities to third persons pursuant to the contract Insurance Liability and Third Persons clause; Establishing And Monitoring Contract Type
- Any claim, loss, or damage resulting from a risk for which the contractor has been relieved of liability by the contract Government property clause;
- Any claim, loss, or damage resulting from a risk identified in the contract as unusually hazardous or as a nuclear risk and against which the Government has expressly agreed to indemnify the contractor; or
- Any other costs specifically excluded from fee calculations by the contract.

**Step 3. Calculate the contractor’s share of any costs over or under target.** Use the final contract cost calculated in Step 2, target cost, and the appropriate share ratio.

\[ P_A = S_C \times (C_T - C_F) \]

Where:
- \( P_A \) = Fee Adjustment
- \( S_C \) = Contractor percentage share of cost risk
- \( C_T \) = Target cost
- \( C_F \) = Final cost

**Step 4. Adjust contract fee considering the contractor’s share of any costs over or under target as calculated in Step 3.**

\[ P_F = P_T + P_A \]

Where:
- \( P_F \) = Final fee amount
- \( P_T \) = Target fee
- \( P_A \) = Fee adjustment (Remember that the fee adjustment may be positive or negative.)

**Step 5. If the fee calculated in Step 4 is more than the maximum fee or less than the minimum fee, adjust it to the appropriate fee.**

**Step 6. Add the final fee to final cost to determine final contract price.**

\[ K_F = C_F + P_F \]

Where:
- \( K_F \) = Final price
- \( C_F \) = Final cost
- \( P_F \) = Final fee amount

**Step 7. Modify the contract, using a bilateral contract modification, to incorporate agreement on final cost and fee.**

*Example of CPIF Contract Final Pricing.* You and the contractor agree that the final cost on a CPIF contract is $1,100,000. Contract target cost is $1,000,000; target fee is $70,000; minimum fee is $20,000; and the over-target share ratio is 87.5/12.5.

**Step 1. Calculate final allowable contract cost.** Final contract cost is $1,100,000

**Step 2. Determine final cost for fee adjustment purposes.** In this contract no costs are excluded from fee calculations, so the final cost for fee calculations is $1,100,000

**Step 3. Calculate the contractor’s share of any costs over or under target.** Calculate contractor’s share of the cost over-target.

\[ P_A = S_C \times (C_T - C_F) \]

\[ = 12.5\% \times ($1,000,000 - $1,100,000) \]

\[ = 12.5\% \times (-$100,000) \]
\begin{align*}
\text{Step 4. Adjust contract fee considering the contractor's share of any costs over or under target as calculated in Step 3.} \\
P_F &= P_T + P_A \\
&= \$70,000 + (-\$12,500) \\
&= \$57,500
\end{align*}

Step 5. If the fee calculated in Step 4 is more than the maximum fee or less than the minimum fee, adjust it to the appropriate fee.
No adjustment is required.
Step 6. Add the final fee to final cost to determine final contract price.

\begin{align*}
K_F &= C_F + P_F \\
&= \$1,100,000 + \$57,500 \\
&= \$1,157,500
\end{align*}

Step 7. Modify the contract, using a bilateral contract modification, to incorporate agreement on final cost and fee.
The final contract price is \$1,157,500.

\textit{Steps for FPIF Contract Final Pricing (FAR 52.216-16).} Computation of the final price under an FPIF contract is very similar to computation of final price under a CPIF contract. The major differences are that there are no limits on profit and total price cannot exceed the contract ceiling price.
Follow the steps below in calculating final FPIF contract price.

\textbf{Step 1. Review the contractor's final cost proposal to develop a position on final contract cost.}
\begin{itemize}
  \item Assure that the contractor's final cost proposal includes all data required by the contract.
  \item Develop a negotiation position based on Government audit recommendations and other available information
\end{itemize}

\textbf{Step 2. Calculate the contractor's share of any costs over or under target.} Use the final contract cost calculated in Step 1, target cost, and the appropriate share ratio.
\begin{align*}
P_A &= S_C (C_T - C_F) \\
\text{where:} \\
P_A &= \text{Profit Adjustment} \\
S_C &= \text{Contractor percentage share of cost risk} \\
C_T &= \text{Target cost} \\
C_F &= \text{Final cost}
\end{align*}

\textbf{Step 3. Adjust contract profit considering the contractor's share of any costs over or under target as calculated in Step 2.}
\begin{align*}
P_F &= P_T + P_A \\
\text{where:} \\
P_F &= \text{Final Profit} \\
P_T &= \text{Target Profit} \\
P_A &= \text{Profit Adjustment (Remember that the profit adjustment may be positive or negative.)}
\end{align*}

\textbf{Step 4. Add the final profit to final cost to determine final contract price.}
\begin{align*}
K_F &= C_F + P_F \\
\text{where:} \\
K_F &= \text{Final price} \\
C_F &= \text{Final cost} \\
P_F &= \text{Final profit}
\end{align*}

\textbf{Step 5. If the price calculated in Step 4 exceeds the contract ceiling price, the final contract price will be the ceiling price.}
\textbf{Step 6. Negotiate final contract price.}
\begin{itemize}
  \item Use the results of Steps 1 through 5 as your objective in negotiating contract final cost. If the contractor provides additional support that leads you to modify your position on final cost, modify your position on final profit and price accordingly.
\end{itemize}
When you reach an agreement on final contract price, modify the contract, using a bilateral contract modification, to incorporate agreement on final cost and profit.

If you cannot reach a final price agreement, it may be necessary for you to issue a final decision under the contract Disputes clause

**Step 7. Obtain a final invoice.** Apply any deductions or withholdings and process the invoice for final payment.

*Example of FPIF Contract Final Pricing.* You and the contractor agree that the final cost on a FPIF contract is $1,310,000. Contract target cost is $1,000,000; target profit is $100,000; ceiling price is $1,325,000; and the over-target share ratio is 75/25.

Step 1. Review the contractor's final cost proposal to develop a position on final contract cost.

The contractor proposed a final contract cost of $1,310,000. Government review and your analysis did not identify any deficiencies.

Step 2. Calculate the contractor's share of any costs over or under target.

\[ P_A = S_C (C_T - C_F) \]

\[ = 25\% \times ($1,000,000 - $1,310,000) \]

\[ = 25\% \times (-$310,000) \]

\[ = -$77,500 \]

Step 3. Adjust contract profit considering the contractor's share of any costs over or under target as calculated in Step 2.

\[ P_F = P_T + P_A \]

\[ = $100,000 - $77,500 \]

\[ = $22,500 \]

Step 4. Add the final profit to final cost to determine final contract price.

\[ K_F = C_F + P_F \]

\[ = $1,310,000 + $22,500 \]

\[ = $1,332,500 \]

Step 5. If the price calculated in Step 4 exceeds the contract ceiling price, the final contract price will be the ceiling price.

Since the price in Step 4 exceeds the contract ceiling price, the final contract price is the ceiling price $1,325,000.


In this example, negotiation should result in acceptance of the contractor's proposed cost.

Step 7. Obtain a final invoice.

Obtain a final invoice and process it for final payment.

### 1.4 Structuring And Applying Award-Fee Pricing Arrangements

In this section, we examine factors to consider in structuring and applying award-fee pricing arrangements.

- **1.4.1 - Structuring An Award-Fee Pricing Arrangement**
- **1.4.2 - Applying An Award-Fee Pricing Arrangement**

**Award-Fee Concept (FAR 16.405-2(a)).** An award-fee contract is a form of incentive contract. Unlike the FPIF or CPIF contract, the award-fee contract does not include predetermined targets and automatic fee adjustment formulas. Contractor performance is motivated by fee adjustments based on a subjective evaluation of contractor performance in areas such as quality, timeliness, technical ingenuity, and cost-effective management.
CPAF Contract Features (FAR 16.405-2(a)). The most common award-fee contract is the cost-plus-award-fee (CPAF) contract.

- A CPAF contract provides for a fee consisting of:
  - A base fee that is fixed at the time of contract award, and
  - An award-fee that the contractor may earn in whole or in part during contract performance. The award-fee must be large enough to motivate the contractor to excel in such areas as quality, timeliness, technical ingenuity, and cost-effective management.

- At established points during contract performance, the Government Fee Determining Official will evaluate contractor performance and determine the amount of award-fee that the contractor will receive from the available award-fee pool in accordance with criteria established in the contract. The determination is made unilaterally by the Fee Determining Official.

Situations for CPAF Contract Use (FAR 16.405-2(b)(1)). Consider a CPAF contract when the following conditions exist:

- It is neither feasible nor effective to devise predetermined objective incentive targets applicable to cost, technical performance, or schedule.

- The likelihood of meeting acquisition objectives will be enhanced by using a contract that effectively motivates the contractor toward exceptional performance and provides the Government with the flexibility to evaluate both actual performance and the conditions under which it was achieved.

- Any additional administrative effort and cost required to monitor and evaluate performance are justified by the expected benefits.

Restrictions on CPAF Contract Use (FAR 16.405-2(c) and DFARS 216.405-2(c)). In addition to restrictions applicable to all cost-reimbursement contracts, FAR directs that CPAF contracts not be used unless the expected benefits are sufficient to warrant the additional administrative effort and cost involved.

Your agency may provide additional restrictions. For example, DoD personnel must not use a CPAF contract:

- To avoid establishing a CPFF contract when the criteria for a CPFF contract apply or developing objective targets so that a CPIF contract can be used.

- For either engineering development or operational development acquisitions which have specifications suitable for simultaneous research and development and production. However, you may use a CPAF contract for individual engineering development or operational system development acquisitions in support of the development of a major weapon system or equipment, where:
  - It is more advantageous to the Government, and
  - The purpose of the acquisition is clearly to determine or solve specific problems associated with the major weapon system or equipment.

Situations for FPAF Contract Use (FAR 16.404(a) and DFARS 216.470). You may use award-fee provisions in fixed-price contracts when the Government wishes to motivate a contractor and other incentives cannot be used because contractor performance cannot be measured objectively. Such contracts must:

- Establish a fixed price (including normal profit) for the effort. This price will be paid for satisfactory contract performance. Award fee earned (if any) will be paid in addition to that fixed price; and

- Provide for periodic evaluation of the contractor's performance against an award-fee plan.

Restrictions on FPAF Contract Use (FAR 16.404(b) and DFARS 216.470). Do not consider an FPAF unless the following conditions exist:

- The administrative costs of conducting award-fee evaluations are not expected to exceed the expected benefits;
• Procedures have been established for conducting the award-fee evaluation;
• The award-fee board has been established; and
• An individual above the level of the contracting officer approved the fixed-price-award-fee incentive.

1.4.1 Structuring An Award-Fee Pricing Arrangement

**Base Fee Objective for CPAF Contracts** (FAR 15.404-4(b)(1), DFARS 215.404-74, and DFARS 216.404-2(c)(2)(B)).

Most agencies (including the DoD) exempt CPAF contracts from the requirement for application of the agency’s structured approach to fee analysis.

Accordingly, you must subjectively develop your base fee objective for each contract considering the following guidelines:

• The base fee must not exceed prescribed agency limits (e.g., three percent of contract cost for DoD contracts).

• The base fee should be large enough to provide the contractor with an adequate fee for rendering minimum acceptable performance, but small enough to provide an award-fee pool that will provide the contractor with an adequate incentive to improve performance above minimum requirements.

**Award-Fee Objective.** The award-fee pool is meant to provide the contractor with an incentive to provide more than the minimum level of performance required by the contract. Based on contract performance, the contractor may earn all, part, or none of the available award-fee pool.

As with base fee, you must subjectively develop your award-fee objective. The award-fee pool should be sufficient to motivate or reward the contractor at any level of performance above the minimum designated in the evaluation criteria. Normally, you should expect the sum of the base fee and the award-fee pool to exceed the fee objectives that would be provided under a CPFF contract.

**Contract Award-Fee Clauses (FAR 16.406(e) and FAR 52.216-7).**

FAR does not prescribe specific award-fee clauses, instead it requires you to insert an appropriate award-fee clause in solicitations and contracts when a CPAF contract is contemplated.

- FAR requires that the clause:
  - Be prescribed by or approved under agency acquisition regulations;
  - Be compatible with the Allowable Cost and Payment clause; and
  - Expressly exclude from the operation of the Disputes clause any disagreement by the contractor concerning the amount of the award fee. (However, this wording does not negate the authority of Courts and Boards to overturn a decision that is arbitrary or capricious (see Burnside-Ott Aviation Training Center v. John H. Dalton, Secretary of the Navy, US-CT-APP-FC, 41 CCF 77,043)).
  - In preparing the clause, also consider the following:

- **Base Fee:**
  - State the agreed-to amount.
  - State how the base fee will be paid (e.g., equal monthly installments).

- **Award-fee:**
  - State the total agreed-to amount.
  - Include a provision for the prompt payment of contractor-earned award-fee after each determination.

- **Award-fee Determination Process:**
The award-fee determination process need not be spelled out in the contract or in an appendix to the contract. Normally, it is preferable to delineate the award-fee determination process in a comprehensive Award-Fee Plan that is identified in the contract.

- State that the Fee Determining Official has the unilateral right to change the Award-Fee Plan, except for conditions that otherwise require mutual agreement under the contract.
- State that the contractor must receive notice of any change to the Plan by a specified number of work or calendar days prior to the beginning of the evaluation period to which the change will apply.

**Award-Fee Evaluations.** Award-fee evaluations should be timed so that the contractor will be periodically informed about performance quality and the areas in which improvement is expected (FAR 16.405-2(b)(3)). Tie partial payment of fee to the evaluations.

- If a program or project is involved, the award-fee evaluation points should be tied to key program decision points.
- If the contract is for a continuing effort (e.g., facility operation and maintenance), the award-fee evaluation points should be established periodically throughout the contract.

**Award-Fee Plan.** The Award-Fee Plan should comprehensively delineate the award-fee determination process.

- Organizational Structure for Award-fee Determination. The plan should identify and define the responsibilities of personnel involved in the award-fee process. The structure should be tailored to fit the contract situation. However, a three-tier structure is common.
  - Fee Determining Official. The Fee Determining Official is responsible for:
    - Determining the award-fee earned and payable for each evaluation period.
    - Changing the matters covered by the Award-Fee Plan, as necessary.
  - Performance Evaluation Board. The Board is responsible for:
    - Conducting ongoing evaluations of contractor performance and making recommendations to the Fee Determining Official concerning award-fee.
    - Considering proposed changes in the Award-Fee Plan and recommending those that it determines are appropriate.
  - Performance Monitor. Assign a performance monitor to each performance area which will be evaluated as part of the Award-Fee Plan.

- Performance Evaluation Criteria (FAR 16.405-2(b)(2)). The plan should identify areas that will be evaluated and how they will be evaluated.
  - The number of evaluation criteria and requirements that they represent will differ widely among contracts.
  - The criteria and the rating plan should motivate the contractor to improve performance in the areas rated, but not at the expense of at least minimum acceptable performance in all other areas. Appendix A presents an example for a contract for shipyard support from DFARS Table 16-1, Performance Evaluation Criteria.

- Performance Evaluation Report Format. The plan should include a format for Performance Monitor evaluation of contractor performance. Appendix B presents an example for shipyard support from DFARS Table 16-2, Contractor Performance Evaluation Report.

1.4.2 Applying An Award-Fee Pricing Arrangement

**Award-Fee Determination Process.** The award-fee determination is a subjective process that requires
effective communication between all the parties involved. The process begins with the Award-Fee Plan and the individual Performance Monitors and follows the general process described below. The overall flow should be modified as necessary to meet agency requirements and the needs of each contracting situation.

Step 1. Performance Monitor orientation.
- Each Performance Monitor should be provided with the following documents:
  - A copy of the contract award-fee provisions.
  - A copy of the Award-Fee Plan.
  - A copy of specific instructions applicable to Performance Monitor assigned areas of evaluation cognizance.
  - The Performance Evaluation Board Chairperson should conduct a discussion of the award-fee determination process in general and the Performance Monitor's responsibilities in particular.
  - The Performance Evaluation Board Chairperson should consider scheduling periodic meetings with Performance Monitors to discuss ongoing contractor performance, general problems and solutions, and other contractual issues.

Step 2. Performance Monitors assess contractor performance throughout the performance period.

Step 3. At the end of each evaluation period, Performance Monitors submit Performance Management Reports to the Performance Evaluation Board. Each report should conform to the requirements of the Award-Fee Plan.

Step 4. The Performance Evaluation Board evaluates information obtained from the Performance Monitors and other available sources of information.
- The Board may request contractor input concerning the reports provided by the Performance Monitors.
- The Board may discuss any questions about the Performance Monitor Reports with the Performance Monitors. For example, a contractor's shortcoming identified in a Performance Monitor Report may have been occasioned by Government influences and decisions to which the contractor responded at the expense of certain aspects of otherwise prescribed contract work. Board members may be in a better position than the Performance Monitor to evaluate the contractor's response.

Step 5. The Board meets and summarizes preliminary findings and positions.

Step 6. After it reaches its preliminary decision, the Board meets with contractor top-management to provide a summary of its preliminary findings and position regarding the performance levels achieved in the areas evaluated.

Step 7. After the conference with the contractor, the Board should consider contractor input and, if appropriate, modify its preliminary findings and recommendations accordingly.

Step 8. The Board Chairperson submits the Performance Evaluation Board Report to the Fee Determining Official.

The Performance Evaluation Board Report should consider such matters as:
- Recommended range of dollars within which the award-fee should fall.
- Performance points assigned by the Board to each performance area and evaluation criterion, if applicable.
- Bases of the performance points assigned.
- Rationale for selecting the recommended award-fee range.

Step 9. The Fee Determining Official considers the recommendation of the Performance Evaluation Board and makes a decision regarding award-fee. That decision may or may not be in accord with the Performance Evaluation Board recommendation. If it is not in accord with the Board recommendation, the Fee Determining Official must assure that reasons for any differences are fully documented.

Step 10. The Fee Determining Official sends the award-fee decision to the contractor.
1.5 Structuring Fixed-Price Redeterminable Pricing Arrangements

**Redeterminable Contract Types** ([FAR 16.205](https://www.federalregister.gov/a/51034) and [FAR 16.206](https://www.federalregister.gov/a/51035)). There are two types of fixed-price contracts that provide for price redetermination without an incentive arrangement, the fixed-price contract with prospective price redetermination (FPRP) and the fixed-ceiling-price contract with retroactive price redetermination (FPRR).

**FPRP Description** ([FAR 16.205-1](https://www.federalregister.gov/a/51036)). A FPRP contract provides for a firm fixed-price for an initial period of contract deliveries or performance and prospective price redetermination at a stated time or times during contract performance for subsequent periods. It can probably be best described as a series of firm fixed-price contracts negotiated at stated times during performance.

**Situations for FPRP Contract Use** ([FAR 16.205-2](https://www.federalregister.gov/a/51037)). You should consider an FPRP contract for acquisitions of quantity production or services for which you can negotiate a fair and reasonable firm fixed-price for the initial period, but not for subsequent periods of contract performance. In the DoD, FPRP contracts are frequently used for aircraft engine acquisition, where the nature of manufacture and resulting methods of accounting for costs lend themselves to periodic, plant-wide pricing on a prospective basis.

**FPRP Elements** ([FAR 16.205-2](https://www.federalregister.gov/a/51038)). The FPRP contracts have two key elements:

- Firm fixed-price for an initial period of contract deliveries or performance.
- Stated time or times for price redetermination.

They generally also have a third element, a ceiling price. In negotiating a ceiling price you should consider the uncertainties involved in contract performance and their cost impact. This ceiling should provide for assumption of a reasonable proportion of the risk by the contractor and, once established, may be adjusted only by operation of contract clauses providing for equitable price adjustment or other revision of the contract price under stated circumstances.

**FPRP Negotiation and Administration** ([FAR 16.205-2](https://www.federalregister.gov/a/51039), [FAR 16.205-3(c)](https://www.federalregister.gov/a/51040), and [FAR 52.216-5](https://www.federalregister.gov/a/51041)). Consider the following points when you negotiate and administer an FPRP contract.

- The initial period for which the price is fixed at the time of contract negotiation should be the longest period for which it is possible to establish a fair and reasonable firm fixed-price.
- The length of the prospective pricing periods will depend on the circumstances of each contract but generally should be at least 12 months.
- The prospective pricing period(s) should conform with the operation of the contractor's accounting system. They can be described in terms of units delivered, or as calendar periods, but generally are defined to end on the last day of a month. The first day of the succeeding period must be the effective date for the price redetermination.
- At a specified time before the end of each redetermination period prior to the last, the contractor is required to submit:
  - Proposed prices for supplies or services to be delivered during the next succeeding period, and:
  - An estimate and breakdown of the costs of these supplies or services in a format that meets the requirements of the law and applicable regulations.
  - Sufficient data to support the accuracy and reliability of this estimate, and
  - An explanation of the differences between this estimate and the original (or last preceding) estimate for the same supplies or services.
  - A statement of all contract costs incurred through the end of the first month (or second if necessary to achieve compatibility with the contractor's accounting system) before submission of the proposed prices.
  - The data must be sufficient to disclose unit cost and cost trends for:
    - Supplies delivered and services performed, and
Inventories of work in process and undelivered contract supplies on hand (estimated to the extent necessary).

- The data format must meet the requirements of the contract, the law, and applicable regulations.

- The contractor must also submit (to the extent that it becomes available before negotiations on price redetermination are concluded):
  - Supplemental statements of costs incurred after proposal submission, and
  - Any other relevant data that you may reasonably require.

- If the contractor fails to submit the data required within the time periods specified, the contracting officer may suspend contract payments until the data are submitted. If it is later determined that the Government overpaid the contractor, the contractor must repay the Government immediately. Unless repaid within 30 days after the end of the data submittal period, the amount of the excess must bear interest - computed from the date the data were due to the date of repayment - at the rate established in accordance with the Interest clause of the contract.

- Upon receipt of the data required, negotiate to redetermine fair and reasonable prices for the supplies and services that may be delivered in the period following the effective date of the price redetermination.

- Formalize each price redetermination in a bilateral contract modification.

- Pending execution of the bilateral contract modification, the contractor will submit invoices or vouchers in accordance with the billing prices established in the contract.
  - If at any time it appears that the then-current billing prices will be substantially different than the estimated prices, negotiate an appropriate change in the billing price.
  - Any billing rate adjustment must be reflected in a contract modification, but it must not affect price redetermination.
  - After price redetermination, adjust the total amount paid or to be paid on all invoices or vouchers to the agreed-upon price. Assure that any required payments or refunds are made promptly.

- If you and the Contractor fail to agree on redetermined prices for any price redetermination period within 60 days (or within such other period as the parties agree) after the date on which the above data are to be submitted, the contracting officer must promptly issue a decision in accordance with the Disputes clause. If the contractor fails to appeal, this decision must be treated as an executed contract modification, unless modified by agreement with the contractor.

- Quarterly -- during periods for which prices have not been established, costs have been incurred, and adjusted billing prices exceed the existing contract price -- the contractor must submit cumulative data showing:
  - Total contract price for all supplies and services delivered and accepted by the Government for which final prices have been established.
  - Total costs (estimated to the extent necessary) for supplies and services delivered and accepted by the Government for which prices have not been established.
  - Interim profit for supplies and services delivered and accepted by the Government for which prices have not been established.
  - The total amount of all invoices or vouchers for supplies or services delivered and accepted by the Government.

**FPRR Description (FAR 16.206-1).** An FPRR contract provides for a fixed ceiling price and retroactive price redetermination within the ceiling price after contract completion.

**Situations for FPRPR Contract Use (FAR 16.206-2 and FAR 16.206-3).** A FPRR contract is appropriate...
for research and development contracts estimated at $100,000 or less when you establish at the outset that a fair and reasonable contract cannot be negotiated and that the amount involved and short performance period make the use of any other fixed-price contract impractical. Before use, obtain approval from the head of the contracting activity (or the higher level official designed by your agency).

**FPRR Elements (FAR 16.206-2 and FAR 16.206-3).** The FPRR contract has three key elements:

- Ceiling price negotiated for the contract at a level that reflects a reasonable sharing of risk by the contractor. The established ceiling price may be adjusted only if required by the operation of contract clauses providing for equitable price adjustment or other revision of the contract price under stated circumstances.
- Billing price that is fair and reasonable as circumstances permit. The billing price may be adjusted during contract performance if circumstances warrant. Any billing price adjustment must be reflected in a contract modification and must not be the final price redetermination.
- Agreement to promptly negotiate a fair and reasonable price after contract completion.

**FPRR Negotiation and Administration (FAR 16.206-3(d) and FAR 52.216-6).** Contract requirements are similar to those for an FPRP contract except that price is not redetermined until all items are delivered. However, you should consider two additional points as you negotiate and administer an FPRR contract.

- When you negotiate the contract, you should emphasize the importance of management effectiveness and ingenuity in contract performance will be considered during final pricing. This emphasis is important because this contract type does not provide the contractor with a calculable incentive for effective cost control, aside from the cost ceiling.
- Within a specified number of days after delivery of supplies or services, the contractor is required to submit:
  - Proposed prices.
  - A statement of all costs incurred during contract performance. The data format must meet the requirements of the contract, the law, and applicable regulations.
  - Any other relevant data that you may reasonably require.

- When you negotiate the redetermined contract price, you should give weight to the management effectiveness and ingenuity exhibited by the contractor during performance.

### Appendix 1A: Performance Evaluation Criteria

<table>
<thead>
<tr>
<th>A Time of Delivery</th>
<th>Submarginal</th>
<th>Marginal</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
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</thead>
<tbody>
<tr>
<td>A-1 Adherence to Plan Schedule</td>
<td>Consistently late on 20% of plans</td>
<td>Late on 10% plans w/o prior agreement</td>
<td>Occasional plan late w/o justification</td>
<td>Meets plan schedule</td>
<td>Delivers all plans on schedule &amp; meets prod. change requirements on schedule</td>
</tr>
<tr>
<td>A-2 Action on Anticipated</td>
<td>Does not expose changes or</td>
<td>Exposes changes but is dilatory in</td>
<td>Anticipates changes, advises</td>
<td>Keeps Shipyard posted on</td>
<td>Anticipates in good time,</td>
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<td>Exposes changes but is dilatory in</td>
<td>Anticipates changes, advises</td>
<td>Keeps Shipyard posted on</td>
<td>Anticipates in good time,</td>
</tr>
<tr>
<td>Delays</td>
<td>resolve them as soon as recognized</td>
<td>resolutio n on plans</td>
<td>Shipyard but misses completio n of design plans 10%</td>
<td>delays, resolves independ ently on plans</td>
<td>advises Shipyard, resolves independ ently and meets productio n schedule</td>
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<tr>
<td>A-3 Plan Maintenance</td>
<td>Does not complete interrelat ed systems studies concurrently</td>
<td>Systems studies complete d but constr. plan changes delayed</td>
<td>Major work plans coordinat ed in time to meet product schedule s</td>
<td>Design changes from studies and inter-related plans issued in time to meet product schedule s</td>
<td>Design changes, studies resolved and test data issued ahead of productio n requirem ents</td>
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<table>
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<tr>
<th>B Quality of Work</th>
<th>B-1 Work Appearance</th>
<th>25% dwgs. not compatibl e with Shipyard repro. processe s and use</th>
<th>20% not compatibl e with Shipyard repro. processe s and use</th>
<th>10% not compatibl e with Shipyard repro. processe s and use</th>
<th>0% dwgs. prepared by design agent not compatibl e with Shipyard repro. processe s and use</th>
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<tbody>
<tr>
<td>B-2 Thoroughness and Accuracy of Work</td>
<td>Is brief on plans tending to leave question able situations for Shipyard to resolve</td>
<td>Has followed guidance , type, and standard dwgs.</td>
<td>Has followed guidance , type, and standard dwgs. questioni ng and resolving doubtful areas</td>
<td>Work complete with notes and thorough explanati ons for anticipate d question able areas</td>
<td>Work of highest caliber incorporating all pertinent data required including related activities</td>
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<tr>
<td>B-3 Engineering Competence</td>
<td>Tendency to follow past practice with no variation to meet requirements job in hand</td>
<td>Adequate engrg. to use &amp; adapt existing designs to suit job for routine work</td>
<td>Engineer to satisfy specs., guidance plans and material provided</td>
<td>Displays excellent knowledg e of constr. reqmts., consideri ng systems aspect, cost, shop capabiliti es and procur ement problems</td>
<td>Exceptional knowledg e of Naval ship work &amp; adaptabili ty to work process incorpora ting knowledg e of future planning in Design</td>
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<tr>
<td>B-4 Liaison Effectiveness</td>
<td>Indifferent to requirements of associate d activities, related systems, and Shipyard advice</td>
<td>Satisfact ory but depende nt on Shipyard to force resolutio n of problems without constructi ve recomme ndations to subcontr. or vendors</td>
<td>Maintains normal contact with associate d activities dependin g on Shipyard for problems requiring military resolutio n</td>
<td>Maintains independent contact with all associate d activities, keeping them informed to produce compatibl e design with little assistanc e for Yard</td>
<td>Maintain expert contact, keeping Shipyard informed, obtaining info. from equip., supplies w/o promptin g by Shipyard</td>
</tr>
<tr>
<td>B-5 Independence and Initiative</td>
<td>Constant surveillan ce req’d to keep job from slipping</td>
<td>Requires occasion al prodding to stay on schedule &amp; expects Shipyard resolutio n of most problems</td>
<td>Normal interest and desire to provide workable plans with average assistanc e &amp; direction by Shipyard</td>
<td>Complete &amp; accurate job. Free of incompati bilities with little or no direction by Shipyard</td>
<td>Develops complete and accurate plans, seeks and resolves with assoc. act. ahead of schedule</td>
</tr>
<tr>
<td>C Effective</td>
<td>C-1 Utilization</td>
<td>Planning of work</td>
<td>Supervision on sets &amp;</td>
<td>System planning</td>
<td>Design paramete</td>
</tr>
<tr>
<td>C-2 Control Direct Charges (except Labor)</td>
<td>Expenditures not controlled for services</td>
<td>Expenditures reviewed occasionally by supervisor, personnel, studies, checked by engineers</td>
<td>Direct charges set &amp; accounted for on each work package</td>
<td>Provides services as part of normal design function w/ extra charges</td>
<td>No cost overruns on original estimates absorbs service demands by Shipyard</td>
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<td>C-3 Performance to Cost Estimate</td>
<td>Does not meet cost estimate for original work or changes 20% of the time</td>
<td>Does not meet cost estimate for original work or changes 20% of the time</td>
<td>Exceeds original est. on change orders 5% time</td>
<td>Exceeds original est. on change orders 5% time</td>
<td>Never exceeds estimates of original package or change orders</td>
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Appendix 1B Contractor Performance Evaluation Report

| Ratings          | Period of _______________
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Note: Provide supporting data and/or justification for below average or outstanding item ratings.

- 2.0 - **Chapter Introduction**
- 2.1 - **Examining Indirect Cost Importance, Composition, and Allowability**
  - 2.1.1 - Examining Indirect Cost Importance and Composition
  - 2.1.2 - Examining the Allowability of Indirect Costs
- 2.2 - **Identifying Pools And Bases For Rate Development**
  - 2.2.1 - Identifying Indirect Cost Pools
  - 2.2.1 - Identifying Indirect Cost Allocation Bases
- 2.3 - **Identifying Inconsistencies And Weaknesses In Rate Development**
  - 2.3.1 - Identifying Cost Allocation Cycle Inconsistencies
  - 2.3.2 - Identifying Apparent Rate Development Process Weaknesses
- 2.4 - **Analyzing Estimated Rates**
- 2.5 - **Contract Forward Pricing**
2.0 Chapter Introduction
This chapter identifies points that you should consider as you evaluate the allocation of indirect costs to various cost objectives.

Analysis Responsibility (FAR 15.402, FAR 15.404-2, and FAR 15.407-3). Because indirect costs affect more than one contract, support from the cognizant auditor and administrative contracting officer (ACO) (when one is assigned) can be particularly important to your analysis. The auditor is the only Government Acquisition Team member with general access to the offeror’s accounting records. The ACO is responsible for negotiating Forward Pricing Rate Agreements (FPRAs), including indirect cost rate agreements. The ACO may unilaterally set rates (forward pricing rate recommendation) for use by the Government in negotiations or other contract actions when forward pricing rate agreement negotiations have not been completed or when the contractor will not agree to a forward pricing rate agreement (FAR 2.101).

However, you must always remember that the contracting officer is ultimately responsibility for determining contract price reasonableness.

Note that Sections 2.1 through 2.5 of this chapter review material presented in Chapter 9 of Cost Analysis (Volume III). That material is presented in this chapter to facilitate understanding of unique issues related to contract billing and final indirect costs.

2.1 Examining Indirect Cost Importance, Composition, And Allowability
This section presents a brief review of indirect cost composition and the importance of indirect costs in contract pricing.

2.1.1 Examining Indirect Cost Composition And Importance

2.1.2 Examining The Allowability Of Indirect Costs

2.1.1 Examining Indirect Cost Composition And Importance

Indirect Cost Relationship to Cost Objectives (FAR 31.202(b) and FAR 31.203). Indirect costs are known by many names. Generally, they are referred to as overhead or burden expense. Two types of cost are typically included in the category:

- Costs that cannot be specifically identified with the production or sale of a particular product or completion of a single contract. In accounting terms, these costs cannot be identified with a single final cost objective. Instead they are identified with two or more final cost objectives or an intermediate cost objective.

For example: The firm rents the plant where hundreds of different products are produced. The rent for that plant cannot be traced to any single product or contract, but none of the products could be made efficiently without the plant. The cost accountants, who maintain the general accounting ledgers of the firm support every operation of the firm, but their efforts cannot be traced directly to any single product or contract.

- Costs of minor dollar amounts that can be specifically identified with the production or sale of a particular product but are not because it is more practical to allocate them as indirect costs. In accounting terms, these direct costs of minor dollar value may be treated as indirect costs if the accounting treatment:
- Is consistently applied to all cost objectives; and
- Produces substantially the same results as treating the cost as a direct cost.

**For example:** This type of cost includes common hardware items, such as washers, rivets, and sandpaper. It would be possible to track the cost of these small-dollar items to specific products, but there is no reason to, as long as the cost allocation method is reasonable and consistently applied to all related cost objectives.

**Composition of Indirect Costs.** The term "indirect costs" covers a wide variety of cost categories and the costs involved are not all incurred for the same reasons. The number of indirect cost accounts in a single firm can range from one to hundreds. In general, indirect cost accounts fall into two broad categories:

- **Overhead.** These are indirect costs related to support of specific operations. Examples include:
  - Material overhead;
  - Manufacturing overhead;
  - Engineering overhead;
  - Field Service overhead; and
  - Site overhead.
- **General and Administrative (G&A) Expenses.** These are management, financial, and other expenses related to the general management and administration of the business unit as a whole. To be considered a G&A Expense of a business unit, the expenditure must be incurred by, or allocated to, the general business unit. Examples of G&A Expense include:
  - Salary and other costs of the executive staff of the corporate or home office;
  - Salary and other costs of such staff services as legal, accounting, public relations, and financial offices; and
  - Selling and marketing expenses.

**Indirect Cost Importance.** While indirect costs are an important consideration in the analysis of most cost proposals, the share of total cost that they represent will vary from firm to firm and industry to industry. For example, expect indirect costs to represent a larger share of a cost proposal for industrial production than for contract services.

- Manufacturing operations typically require substantial investment in plant and equipment—the very type of spending that, in general, cannot be directly charged to any one product.
- Services typically do not require a similar level of investment in plant and equipment.

A recent study of large Defense contractors by the Institute for Defense Analysis (D-764, 1990) provides insight into the growing importance of indirect costs in large manufacturing firms. The data presented in the table below for 1974 and 1987 are actual data collected during the study. The figures for the year 2020 are extensions of the trends identified between 1974 and 1987 and are presented to highlight the implications of the identified trends for the future of Government contract pricing.

<table>
<thead>
<tr>
<th>Category of Cost</th>
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<tr>
<td></td>
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<td>Direct Labor</td>
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<tr>
<td>Manufacturing Labor</td>
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<td>Engineering-Related²</td>
<td>11</td>
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<tr>
<td>Direct Material</td>
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</table>

¹ Figures for 2020 are extensions of the trends identified between 1974 and 1987.
The magnitude of indirect costs in a typical cost proposal emphasizes the importance of careful analysis of indirect costs in contract pricing. Furthermore, the above data indicate that thorough analysis of indirect costs can be expected to be even more important in the future.

### 2.1.2 Examining The Allowability Of Indirect Costs

**Factors Affecting Cost Allowability (FAR 31.201-2).** Because they cannot be identified with a single, final cost objective, indirect costs are particularly susceptible to charges that they are not allowable. For that reason, this section will present a brief review of the general criteria governing cost allowability. Remember, Government auditors and other specialists will make recommendations on cost allowability, but the ultimate decision rests with the contracting officer.

The factors that you must consider in determining whether a particular cost is allowable include:

- Cost reasonableness;
- Cost allocability to the contract;
- Requirements of cost accounting principles, practices, and standards;
- Limitations of applicable cost principles; and
- Terms of the contract.

**Determining Cost Reasonableness (FAR 31.201-3).** A cost is reasonable if, in its nature and amount, it does not exceed what a prudent person would pay in the conduct of competitive business. **Do not** assume that a cost is reasonable just because the contractor has already incurred the cost. If you challenge the reasonableness of an incurred cost, the burden of proof shall be on the contractor to establish that the cost is reasonable.

If the answer to any of the following questions is "no", the cost involved is probably not reasonable:

- Is the type of cost generally recognized as necessary in conducting the contractor's business?
- Is the cost consistent with sound business practice, law, regulation, and the principles of "arm's-length" bargaining?
- Does the contractor's action reflect a responsible attitude toward the Government, other customers, the owners of the business, the employees, and the public-at-large?
- Are the contractor's actions consistent with the contractor's established practices?

**Determining Cost Allocability (FAR 31.201-4).** A cost is allocable if it is assignable or chargeable to one or more cost objectives on the basis of relative benefits received or other equitable relationship. Typically, we think of cost objectives as individual contracts or jobs. However, cost objectives can include other objectives, such as contractor independent research and development.

If you can answer "yes" to any of the following questions, the cost involved is probably allocable to the related cost objective:

- Was the cost specifically incurred for that cost objective?
- If the cost benefits both the contract and other work, was the cost allocated to the cost objective in reasonable proportion to the benefits received?
- Is the cost necessary for overall operation of the business even though a relationship any particular cost objectives cannot be shown?

**Accounting Principles, Practices, and Standards** (FAR 31.201-2(a)(3), FAR Subpart 42.7, and FAR Appendix B). Three sources provide overall guidance on cost allowability. In order of precedence, they are:
Cost Accounting Standards. The 19 Cost Accounting Standards (CAS) identified in the table below have been promulgated by the Cost Accounting Standards Board (CASB). When applicable, these Standards take precedence over all other forms of accounting guidance.

Compliance is required for all Government contracts unless an exemption applies. Exemptions include contracts awarded:

- Using sealed bidding;
- At a price of $500,000 or less;
- To a small business;
- For a commercial item; or
- For a firm-fixed price without submission of cost or pricing data.

Even when no exemption applies, contractors with less than $50 million in CAS-covered contracts may elect modified coverage which only requires compliance with CAS 401, 402, 405, and 406.

### COST ACCOUNTING STANDARDS

<table>
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<tr>
<th>Accounting Concepts and Principles</th>
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<tr>
<td><strong>CAS 401</strong></td>
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<td><strong>CAS 402</strong></td>
<td>Consistency in Allocating, Costs Incurred for the Same Purpose</td>
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<td><strong>CAS 405</strong></td>
<td>Accounting for Unallowable Costs</td>
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<td><strong>CAS 406</strong></td>
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<td>CAS 417</td>
<td>Cost of Money as an Element of the Cost of Capital Assets under Construction</td>
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</table>

- **Federal Acquisition Regulation.** Many parts of the FAR provide accounting guidance that applies to all Government contracts. For example, *FAR Subpart 42.7* prescribes policies and procedures for establishing indirect cost billing rates and final indirect cost rates. In some cases, FAR guidance requires all Government contractors to comply with the same accounting standards defined for CAS-covered contracts.

- **Generally Accepted Accounting Practices.** *Generally Accepted Accounting Practices (GAAP)* are non-regulatory accounting guidelines developed by Certified Public Accountants (CPAs). Accountants use GAAP in preparing and managing all business accounting records. As a result, they serve as the basis for the accounting systems used by Government contractors.

Guidance in the FAR and CAS generally build on GAAP. For example, the GAAP require accountants to maintain records by accounting period. CAS 406, Cost Accounting Period, prescribes that the accounting period will be one year, except in certain specific situations. If the contractor is in compliance with applicable GAAP, FAR, and CAS requirements, you should be able to answer “yes” to the following questions:

- Does the cognizant Government auditor consider the offeror’s accounting system adequate?
- If the proposed contract is to be subject to modified CAS coverage, is the offeror in compliance with applicable Standards?
- If the proposed contract is to be subject to full CAS coverage, is the offeror in compliance with applicable Standards and the firm’s Disclosure Statement?

*Cost Principles.* *FAR 31.205* provides fifty cost principles for contracts with commercial organizations. Each cost principle defines a particular type of cost and establishes whether it is generally allowable, unallowable, or allowable with some restrictions.

- **Allowable Cost.** Costs are expressly identified as allowable as long as they meet the requirements of the other four tests of allowability (e.g., reasonableness). NOTE: Costs not addressed in the cost principles are also allowable if they meet the requirements of the other four tests of allowability.
- **Unallowable Cost.** Costs are expressly identified as unallowable. These costs cannot be included in cost estimates or contract cost reimbursements.

- **Allowable with Restrictions.** Costs are expressly identified as allowable (subject to the other four tests of allowability) but with some restriction (e.g., on the amount allowable).

The following table identifies the current cost principles in *[FAR 31.205](http://farsi.te.hill.af.mil/reg/html/regs/far2a/fmcfars/fardfars/far/31.htm-P1119_200343)*, and summarizes the allowability of costs identified in the cost principle. Note that within the same general cost category, some costs may be allowable (A), others unallowable (UA), and still others allowable with restrictions (AWR). In addition, a particular principle may identify a cost as generally unallowable, but refer the reader to another principle that makes a particular element of that cost allowable.

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<tr>
<td>Plant Protection</td>
<td>31.205-29</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patent Costs</td>
<td>31.205-30</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>Code</td>
<td>Description</td>
<td>URL</td>
<td>X</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Professional &amp; Consultant Service</td>
<td>31.205-33</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Recruitment Costs</td>
<td>31.205-34</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Relocation Costs</td>
<td>31.205-35</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Rental Costs</td>
<td>31.205-36</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Costs Type</td>
<td>Code</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Selling Costs</td>
<td>31.205-38</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Service &amp; Warranty Costs</td>
<td>31.205-39</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>31.205-41</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Termination Costs</td>
<td>31.205-42</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Training &amp; Education Costs</td>
<td>31.205-44</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

If the contractor is in compliance with the requirements of the FAR specific cost principles, you should be able to answer "yes" to the following questions:
• Are costs allowable under FAR Subpart 31.205?
• Are questionable costs correctly classified using FAR Subpart 31.205 definitions?
• Could the questionable cost be defined under more than one cost principle?

Contract Terms (FAR 31.201-2(a)(4)). Specific types of cost are often addressed in the solicitation and contract. For example, while transportation costs are generally allowable, the contract could limit costs to the rates for a specific mode (e.g., 3rd class mail). Contract terms can only be more restrictive than the other four tests of allowability, not less. Contract terms cannot make an otherwise unallowable cost allowable.

If the contractor is in compliance with specific contract terms, you should be able to answer "yes" to the following question:
• Is the contractor complying with any specific contract language that dictates the treatment of certain costs?

2.2 Identifying Pools And Bases For Rate Development
This section identifies points that you should consider as you identify the bases and pools needed to calculate the rates used to allocate indirect costs to various cost objectives.
  • 2.2.1 - Identifying Indirect Cost Pools
  • 2.2.2 - Identifying Indirect Cost Allocation Bases

Indirect Cost Allocation Rates. Since indirect costs are not directly related to a single cost objective, how do you know when they should be charged to a particular product? We use indirect cost rates. As a larger share of a contractor's direct effort (e.g., manufacturing) is required to produce a particular product, use of an indirect cost rate will assure that a larger share of the indirect costs that the contractor incurs in support of that direct effort (e.g., costs such as supervision, utilities, and maintenance) is charged to the contract.

Indirect Cost Rate Formula. The amount of indirect cost that is charged to a particular product is determined by the appropriate indirect cost rates (also known as overhead or burden rates). Indirect cost rates are expressed in terms such as dollars per hour or percentage of cost. Indirect cost rates are calculated for each accounting period by dividing a pool of indirect cost for the period by the allocation base (e.g. direct labor hours or direct labor cost) for the same period.

Indirect Cost Rate = \frac{\text{Indirect Cost Pool}}{\text{Indirect Cost Allocation Base}}

Once a rate is established, you can use it to determine the amount of indirect cost that should be allocated to the contract. Simply multiply the rate by the estimated or actual amount of the allocation base in the contract for that period. Contracts with a greater share of the allocation base (e.g., direct labor dollars) will be charged a greater share of the related indirect cost pool (e.g., manufacturing overhead). Contracts with a smaller share of the base will be charged a smaller share of the related indirect cost pool.

2.2.1 Identifying Indirect Cost Pools

Indirect Cost Pool Definition (FAR 31.203(b)). For each indirect cost rate, identify the INDIRECT COST POOL.

Indirect Cost Rate = \frac{\text{INDIRECT COST POOL}}{\text{Indirect Cost Allocation Base}}

An indirect cost pool is a logical grouping of indirect costs with a similar relationship to the cost objectives. For example, engineering overhead pools include indirect costs that are associated with engineering effort. Likewise, manufacturing overhead pools include indirect costs associated with manufacturing effort.

A properly developed indirect cost pool, should permit allocation of the included indirect costs in a manner similar to the allocation that would occur if the firm allocated each indirect cost separately. For example: The firm could allocate the labor for maintenance of the building housing the firm's engineers and the electricity for the same building using two different indirect cost rates. Logically, both would be allocated based on the use of engineering services. Since both would use the same or similar allocation base, combining them into a pool (along with other engineering-related indirect costs) simplifies
and clarifies the allocation process. 

**Primary Indirect Cost Pools.** The indirect cost pools used to make the final allocation of indirect costs to cost objectives are known as primary pools. The table on the next page lists some of the more common primary pools and types of costs often found in each pool. A typical cost identified in the table with a particular pool (e.g., inbound transportation is identified with material overhead) could be:

- Combined with the related indirect costs into a single indirect cost pool (e.g., a single material overhead pool);
- Combined with some of the related indirect costs into one of several related indirect cost pools (e.g., indirect labor could be combined with one or two related expenses into a single pool);
- Allocated individually.

Remember that every firm's accounting system is different. The following list is only typical; do not regard it as the only correct way to group costs.

<table>
<thead>
<tr>
<th>Common Primary Cost Pools and Typical Costs Found in Each</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Pools</strong></td>
<td><strong>Typical Costs Found in the Pool</strong></td>
</tr>
<tr>
<td>Material Overhead</td>
<td>- Acquisition (Purchasing)</td>
</tr>
<tr>
<td></td>
<td>- Inbound transportation</td>
</tr>
<tr>
<td></td>
<td>- Indirect labor</td>
</tr>
<tr>
<td></td>
<td>- Employee related expenses (shift &amp; overtime premiums, employee taxes, fringe benefits)</td>
</tr>
<tr>
<td></td>
<td>- Receiving and inspection</td>
</tr>
<tr>
<td></td>
<td>- Material handling and storage</td>
</tr>
<tr>
<td></td>
<td>- Vendor quality assurance</td>
</tr>
<tr>
<td></td>
<td>- Scrap sales credits</td>
</tr>
<tr>
<td></td>
<td>- Inventory adjustments</td>
</tr>
<tr>
<td>Operations Overhead (e.g., Manufacturing, Engineering, Field Service, and Site Operations)</td>
<td>- Indirect labor and supervision</td>
</tr>
<tr>
<td></td>
<td>- Perishable tooling (primarily in manufacturing overhead)</td>
</tr>
<tr>
<td></td>
<td>- Employees related expenses (shift &amp; overtime premiums, employee taxes, fringe benefits)</td>
</tr>
<tr>
<td></td>
<td>- Indirect material &amp; supplies (small tools, grinding wheels, lubricating oils)</td>
</tr>
<tr>
<td></td>
<td>- Fixed charges (e.g., depreciation, insurance, rent, property taxes)</td>
</tr>
<tr>
<td></td>
<td>- Downtime of direct employees (training, vacation pay, regular pay) when not working on a specific contract/job</td>
</tr>
<tr>
<td>General &amp; Administrative Expense</td>
<td>- General &amp; executive office</td>
</tr>
<tr>
<td></td>
<td>- Staff services (legal, accounting, public)</td>
</tr>
</tbody>
</table>
Secondary Indirect Cost Pools. A secondary pool is an intermediate pool that is used to allocate indirect costs to primary pools. Some indirect costs obviously belong to one specific primary pool. For example, the salary of a manufacturing manager would logically be charged as part of a manufacturing overhead pool. The company president's salary would be part of the general and administrative cost pool. These costs therefore would appear only in the appropriate primary pool.

The proper account for other indirect costs may not be so obvious. For example, manufacturing and engineering share a building. Should facility expenses (e.g., building depreciation, utilities, and maintenance) be charged to engineering or manufacturing? The answer is that both should share the cost based on a causal or beneficial relationship with the cost involved. For example, facilities expenses could be allocated based on the share of available floor space occupied.

A reasonable share of each cost could be separately allocated to the appropriate primary pool, or the related costs could be grouped and allocated together. If the costs are grouped for allocation, the cost grouping is known as a secondary pool.

The figure below depicts the allocation of the expenses related to a shared facility based on the number of square feet occupied by each occupant. If engineering occupies 60 percent of the building, 60 percent of the facility-related expenses will be allocated to the engineering overhead pool. Forty percent will be allocated to the manufacturing overhead pool.

Service Centers. Service centers are unique in that they include costs that can be allocated as a direct cost or an indirect cost depending on the particular circumstances. Primary allocation concerns include identification of:
• The user of the service and
• The purpose of that use.

For example: Copy center costs may be allocated based on the number of copies reproduced.
• A copy of a manufacturing drawing might be charged to manufacturing overhead.
• A copy of an engineering report might be charged to engineering overhead.
• A copy of the facility manager's weekly calendar might be charged to the facilities secondary pool.
• A deliverable copy of a research report prepared for the Government might be charged as a direct cost.

Remember that the firm must clearly define how service center costs will be allocated. Definition of the circumstances related to each different type of accounting treatment is particularly important. Clear definition will help avoid erroneous double charges that occur when the firm charges a service center cost as a direct cost while charging the same or similar cost as an indirect cost.

<table>
<thead>
<tr>
<th>Service Center Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Copy center</td>
</tr>
<tr>
<td>• Business data processing</td>
</tr>
<tr>
<td>• Photographic services</td>
</tr>
<tr>
<td>• Reproduction services</td>
</tr>
<tr>
<td>• Art services</td>
</tr>
<tr>
<td>• Technical data processing services</td>
</tr>
<tr>
<td>• Communication services</td>
</tr>
<tr>
<td>• Facility services</td>
</tr>
<tr>
<td>• Motor pool services</td>
</tr>
<tr>
<td>• Company aircraft services</td>
</tr>
<tr>
<td>• Wind tunnels</td>
</tr>
<tr>
<td>• Scientific computer operations</td>
</tr>
</tbody>
</table>

2.2.2 Identifying Indirect Cost Allocation Bases

Indirect Cost Allocation Base Definition (FAR 31.203(b)). For each indirect cost rate, identify the INDIRECT COST ALLOCATION BASE.

Indirect Cost Rate = Indirect Cost Pool
INDIRECT COST ALLOCATION BASE
An indirect cost allocation base is some measure of direct contractor effort that can be used to allocate pool costs based on benefits accrued by the several cost objectives. Examples of typical bases:

- Direct labor hours
- Direct labor dollars
- Number of units produced
- Number of machine hours.

The type of base determines whether the indirect cost rate will take the form of a percentage or a dollar rate per unit of measure. The following are some common bases that could be used in manufacturing indirect cost allocation:

\[
\text{Dollars per Direct Labor Hour} = \frac{\text{Pool Dollars}}{\text{Direct Labor Hours}}
\]

\[
\text{Percent of Direct Labor Dollars} = \frac{\text{Pool Dollars}}{\text{Direct Labor Hours}} \times 100
\]

\[
\text{Dollars per Unit of Production} = \frac{\text{Pool Dollars}}{\# \text{ of Production Units}}
\]

\[
\text{Dollars per Machine Hour} = \frac{\text{Pool Dollars}}{\text{Machine Hours}}
\]

Whatever the allocation base, the larger a contract's share of the allocation base for the accounting period, the larger the contract's share of the related indirect cost.

Selecting an Allocation Base. When selecting an allocation base for the indirect cost pool, firms consider the type of indirect costs in the pool and whether the base will provide a reasonable representation of the relative consumption of pooled indirect costs by direct cost activities. Each allocation base should be representative of the breadth of activities supported by the pooled indirect costs.

For example: If the firm's manufacturing operation is labor intensive and the pool is predominantly labor related (e.g., fringe benefit costs) the contractor will probably select a base related to labor effort for allocating manufacturing overhead costs. If the manufacturing operation is automated with little labor effort, the contractor will probably select a base related to the machinery use (e.g., machine hours).

Common Allocation Bases. The following table represents some of the more common bases and the type of pools that they are typically used to allocate:

<table>
<thead>
<tr>
<th>Types of Indirect Cost Pools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation Bases</td>
</tr>
<tr>
<td>Manufacturing</td>
</tr>
<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Field Service</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>General &amp; Administrative</td>
</tr>
<tr>
<td>Secondary Pools</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Cost Input 1</th>
<th>Cost of Value-Added 2</th>
<th>Direct Labor Dollars</th>
<th>Direct Labor Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


| Machine Hours | · |
| Units of Product ³ | · |
| # of Purchase Orders | · |
| Direct Material Cost | · |
| Total Payroll Dollars | · |
| Head Count | · |
| Square Footage | · |

1 Also referred to as the "Cost of Goods Manufactured" or "Production Cost" during the accounting period. It typically includes all costs except general and administrative expense.
2 Also referred to as "Conversion Cost." It is the sum of direct labor costs, other direct costs, and associated indirect costs.
3 Units of Product refers to units of final product produced. It is only an acceptable base when final products are relatively homogeneous and represent a reasonable measure of benefit from the appropriate pool.

2.3 Identifying Inconsistencies And Weaknesses In Rate Development

This section identifies points that you should consider as you evaluate the estimating process used by the contractor in indirect cost rate development.

- 2.3.1 - Identifying Cost Allocation Cycle Inconsistencies
- 2.3.2 - Identifying Apparent Rate Development Process Weaknesses

**Importance of Accurate Indirect Cost Rate Estimates.** Accurate indirect cost rate estimates are essential for effective cost analysis, because actual indirect cost rates will not be known until after the end of the accounting period. By that time, part or all of the contract effort will be complete. Rate estimates are used for forward pricing, as well as progress payments or cost-reimbursement. You and the contractor may even agree to use estimated quick-closeout indirect cost rates for final pricing of flexibly-priced contracts, before actual rates are known for certain.

**Points to Consider.** As you review the estimating process used by the contractor in indirect cost rate development:

- Identify apparent inconsistencies in the indirect cost allocation cycle.
- Identify apparent weaknesses in the indirect cost rate estimating process.
- Assure that concerns about the estimating process are well documented.

2.3.1 Identifying Cost Allocation Cycle Inconsistencies

*Indirect Cost Allocation Cycle (FAR 15.407-3, FAR 42.701, FAR 42.704, and FAR 42.705).* Indirect cost allocation typically follows the cycle depicted in the following figure:
- **Forward Pricing.** During this phase, the contractor proposes forward pricing rates and uses those rates in contract proposal pricing. Initial estimates are often developed several years before the accounting period even begins. However, estimates should be updated as more accurate cost data become available. As part of your cost analysis, you must assure that all forward pricing rates used in contract pricing are reasonable.

- **Contract Billing.** When a contract involves progress payments or cost reimbursement, Government personnel must monitor contract billing rates to assure that payments or reimbursements based on those rates are reasonable. During each cost accounting period, rates should become increasingly accurate as more actual cost data become available. The contracting officer or auditor responsible for determining final indirect cost rates is also responsible for determining contract the billing rates.

- **Final Pricing.** After the cost accounting period is completed, contractors can calculate actual indirect cost rates to determine actual contract cost. For contracts that require final pricing (e.g., fixed-price incentive and cost-reimbursement contracts), the responsible contracting officer or auditor must determine final overhead rates for the contract. This determination will be based on the Government's evaluation of the final overhead rate proposal submitted by the contractor. Unfortunately, months or years may be required to complete this process. Under certain conditions set forth in the FAR, you and the contractor may agree to use estimated quick-closeout indirect cost rates for final pricing of flexibly-priced contracts, before actual rates are known for certain (FAR 42.708(a)).

*Rates Are Part of a Continuing Allocation Cycle.* Remember that forward-pricing rates, billing rates, and final rates are all part of a continuing indirect cost allocation cycle.

  - Forward pricing rates will affect budget decisions and the rates used in contract billing.
  - Billing rate estimates will affect the need for cost adjustment during final contract pricing.
  - Final rates can be used to measure the actual allocation of direct cost to a particular cost objective. In addition, the data used to support final rates will become part of the data available for estimating forward pricing and billing rates for subsequent accounting periods.

*Identifying Inconsistencies in Cost Allocation Cycle Information.* As you review the estimating process used in rate development, identify any inconsistencies regarding the relationship between the proposed rates and related rates in the indirect cost allocation cycle. Ask questions such as the following:

  - How does the proposed rate compare with other rates in the indirect cost allocation cycle?
For example, proposed forward pricing rates and billing rates for the same accounting period should be identical or very similar.

- Has rate accuracy consistently improved throughout the allocation cycle?

The relationship between past forward pricing rates and actual rates should provide information on the firm’s past estimating accuracy. Billing rates near the end of the accounting period should be close to the actual rates experienced for the period. Quick closeout rates should be comparable to actual rates.

- Does the contractor update rate estimates as more information becomes available?

Indirect cost rates for each accounting period are estimates until actual costs are determined after the end of the period. However, the rates should be updated as more information becomes available.

### 2.3.2 Identifying Apparent Rate Development Process Weaknesses

**Review Information on the Steps Used to Estimate Indirect Cost Rates.** Initial indirect cost rate estimates for a particular accounting period are generally developed before the period begins. In fact, contractors pricing long-term contracts are frequently required to forecast rates three to five years into the future. Rate estimates should be updated as more information becomes available, both before and during the accounting period to which the rate applies.

Review information submitted by the offeror regarding the steps used to estimate indirect cost rates for each accounting period. While the exact process will vary from firm to firm, the general process should follow four steps:

- **Estimate Sales Volume for the Period** -- the total goods and services that the firm expects to sell to ALL customers during each forecast period (e.g., fiscal year of the firm).
- **Estimate Indirect Cost Allocation Bases for the Period** -- the measures of direct contractor activity that will be used to allocate pool costs based on the benefits accrued by the several cost objectives. Measures can take the form of dollars, hours, or any other appropriate measure.
- **Estimate Indirect Cost Pools for the Period** -- logical groupings of indirect costs with a similar relationship to the cost objectives.
- **Estimate Indirect Cost Rates for the Period** -- divide each indirect cost pool by the appropriate allocation base.

**Review Information on Estimated Sales Volume for the Period.** The starting point for any indirect cost rate estimate should be a sales forecast for the accounting period. An accurate estimate of volume is essential to estimating indirect cost rates, because indirect cost pools are typically composed primarily of fixed and semivariable costs. As fixed costs and the fixed component of semivariable costs are spread over more and more direct effort, indirect cost rates will decline. As a result, lower sales volume estimates will result in higher rates, and higher volume estimates will result in lower rates. Logically, contractors normally prefer to conservatively estimate business volume, so as not to underestimate cost. However if the contractor is too conservative, the result may be overly high indirect cost rates.

For a manufacturer, estimators will consider the production and sales for each product line. For services, estimators will consider the number of contracts that the firm expects to be awarded and the effort required to complete each contract. Separate forecasts are developed for each accounting period (normally one year).

As you review the offeror’s sales estimate, ask questions such as the following:

- Is the sales forecast used for estimating indirect cost rates based on the best information available?

Estimates made prior to the beginning of the accounting period may be based on relatively speculative data. However, estimates should become firmer as more detailed plans are formulated for the period. Estimates should become firmer still as actual sales data for the period become available.

- Does the sales forecast consider all work likely to benefit from the indirect cost pool?

To produce accurate rates, forecasts must include all work projected to benefit from the indirect cost pool during the accounting period. Estimates should include all work that is on contract, options that may be exercised, proposals with a high probability of success, solicitations in hand, and other anticipated customer requirements.

**Review Information on Estimated Indirect Cost Allocation Bases for the Period** (FAR Table 15-2).
Next, the firm should translate the sales volume forecast into production or contract performance schedules. Given the projected schedules, the estimator can forecast total direct effort associated with operations during each forecast period. Estimates of the direct effort will include estimates of the direct labor and material requirements for the period. Estimates will also include the allocation base for each indirect cost rate.

For cost or pricing data submissions, FAR Table 15-2 requires that the proposal state how the offeror computed and applied indirect costs, including cost breakdowns, and showing trends and budget data, to provide a basis for evaluating the reasonableness of proposed rates. That information should include:

- An estimate of the size of the allocation base.
- An explanation of how the allocation base was estimated.
- The date that the allocation base estimate was developed.
- Data on the historical trends in the allocation base.
- An explanation of any significant differences between the historical, proposed, and budgeted dollar values of the allocation base.

As you review the contractor’s indirect cost allocation base estimate, ask questions such as the following:

- What is the relationship between the estimated indirect cost allocation base and the estimated sales volume?

Make sure that you understand the relationship as described by the contractor. Document any unexplained differences between the relationship described by the contractor and observed historical relationships for further analysis.

- Are there any differences between the proposed indirect cost allocation base and related budget estimates?

Many times the estimated indirect cost allocation base is different than the internal budget for the same category of cost. The firm may state that it wants to challenge managers and hold the difference in reserve. Make sure that you understand the contractor’s rationale, as well as the realism of any differences between current estimates and historical trends.

- Have past differences between allocation base estimates and actual allocation bases for the same period been adequately explained?

Look for patterns such as consistent under estimation of the allocation base. Document any unexplained differences for further analysis.

- Are the data used to develop the allocation base estimates accurate, complete, and current?

By law, all cost or pricing data must be accurate, complete, and current. Information other than cost or pricing data should also be up to date. In particular, you should carefully review any allocation base involved in any allegations of defective pricing.

- Did the cognizant auditor or administrative contracting officer question any of the indirect cost allocation base estimates prepared by the contractor?

Because indirect cost pools apply across a broad spectrum of contracts, the cognizant auditor and administrative contracting officer (when one is assigned) are normally most familiar with the factors affecting estimates.

Review Information on Estimated Indirect Cost Pools for the Period. Given the estimated volume of work to be performed, the firm should next estimate the likely size of each indirect cost pool. As described above, indirect cost pools are typically composed primarily of fixed and semivariable costs. As volume increases, variable indirect costs will increase. However, the indirect cost rate will normally decrease because the fixed portion of the pool will be spread over a larger volume.

As with the allocation base, the offeror must provide adequate supporting documentation. That documentation should include the following information:

- The estimated dollar value of the pool.
- An explanation of how the pool was estimated.
The date that the pool estimate was developed.
- Data on historical trends in the pool.
- An explanation of any significant differences between the historical, proposed, and budgeted dollar values of the pool.

As you review the contractor's indirect cost pool estimate, ask questions such as the following:
- What is the relationship between the estimated indirect cost pool and the estimated sales volume?

Make sure that you understand the relationship as described by the contractor. Document any unexplained differences between the relationship described by the contractor and observed historical relationships for further analysis.
- What is the relationship between the estimated indirect cost pool and the estimated allocation base?

Make sure that you understand the historical trends in the relationship between the indirect cost allocation base and the indirect cost pool. You can use this relationship to identify significant changes in the estimated rate structure. Document any unexplained differences between the historical relationship and the proposed rates for further analysis.
- Are there any differences between the proposed indirect cost pool and related budget estimates?

Make sure that you understand the contractor's rationale, as well as the realism of any differences between current estimates and historical trends.
- Have past differences between indirect cost pool estimates and actual pools for the same period been adequately explained?

Look for patterns such as consistent over estimation of the pool. Document any unexplained differences for further analysis.
- Are the data used to develop the indirect cost pool estimates accurate, complete, and current?

By law, all cost or pricing data must be accurate, complete, and current. Information other than cost or pricing data should also be up to date. In particular, you should carefully review any allocation base involved in any allegations of defective pricing.
- Did the cognizant auditor or administrative contracting officer question any of the indirect cost pool estimates prepared by the contractor?

Because indirect cost pools apply across a broad spectrum of contracts, the cognizant auditor and administrative contracting officer (when one is assigned) are normally most familiar with the factors affecting estimates.

**Review Information on Indirect Cost Rate Estimates for the Period.** When the indirect cost allocation base and the indirect cost pool estimates have been completed, the only task remaining is to divide the estimated pool by the estimated allocation base to establish the indirect cost rate.

The table below presents rate forecasts for the next three years. Note that the base and pool estimates for material, engineering, and manufacturing, become the estimate of total cost input, the base for the G&A expense rate.

<table>
<thead>
<tr>
<th>3-Year Indirect Cost Rate Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimate</td>
</tr>
<tr>
<td>Sales Estimate</td>
</tr>
<tr>
<td>Direct Material</td>
</tr>
<tr>
<td>Material Overhead</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Engineering Direct Labor</td>
</tr>
<tr>
<td>Engineering Overhead</td>
</tr>
<tr>
<td>Manufacturing Direct Labor</td>
</tr>
<tr>
<td>Manufacturing Overhead</td>
</tr>
<tr>
<td>Total Cost Input</td>
</tr>
<tr>
<td>G&amp;A Expense</td>
</tr>
<tr>
<td>Total Cost</td>
</tr>
<tr>
<td>Material Overhead Rate</td>
</tr>
<tr>
<td>(With Direct Material Cost Base)</td>
</tr>
<tr>
<td>Engineering Overhead Rate</td>
</tr>
<tr>
<td>(With Engineering Direct Labor Cost Base)</td>
</tr>
<tr>
<td>Manufacturing Overhead Rate</td>
</tr>
<tr>
<td>(With Manufacturing Direct Labor Cost Base)</td>
</tr>
<tr>
<td>G&amp;A Expense Rate</td>
</tr>
<tr>
<td>(With Total Cost Input Base)</td>
</tr>
</tbody>
</table>

Normally, you should expect more detail in support of rate calculations. Consider the requirements of FAR Table 15-2 whenever you establish requirements for cost or pricing data or information other than cost or pricing data in support of indirect costs rates.

Any contractor should be able to provide you with this level of data along with detailed rationale for rate projections. Most contractors will provide you with substantially more detailed data. Assure that any data submitted meet solicitation requirements.

As you review the contractor’s rate calculation and the overall data submission, ask questions such as the following:

- Has the contractor’s estimating system been refused approval by the cognizant auditor?

An inadequate estimating system increases the risk that the system will not provide an adequate cost estimate.

- Does the overall data submission comply with the requirements of FAR and the solicitation?

Any data submission that does not meet FAR or solicitation requirements deserves special attention during cost analysis.

2.4 Analyzing Estimated Rates

Caution for Indirect Cost Rate Analysis. When you analyze indirect cost rates, do not fall into the trap of looking at a rate and immediately determining that it is too high or too low without analysis of the indirect cost allocation base and indirect cost pool. A rate of 400 percent can be reasonable and a rate of 10 percent can be unreasonable depending on the base, types of costs in the pool, reasonableness of the costs in the pool, and the overall effect on total cost and the operations of the firm. Also avoid the trap of assuming that a rate for one firm is necessarily a good yardstick for evaluating the rates of other firms in the same industry and/or of the same size.

Steps for Indirect Cost Rate Analysis. There are six general steps that you should follow as you analyze
indirect cost rate estimates:
1. Develop an analysis plan.
2. Identify unallowable costs.
3. Analyze the indirect cost allocation base estimate.
4. Convert the indirect cost allocation base and the indirect cost pool to constant-year dollars.
5. Analyze the base/pool relationship.
6. Develop and document your pricing position.

**Develop an Analysis Plan (FAR 15.404-2(c)).** Develop a plan that tailors your in-depth indirect cost analysis efforts to areas that demonstrate the greatest cost risk to the Government. Unless required by agency or local procedures, the plan need not be in writing, but it should consider the risk to Government in terms of dollars involved and probability that the rates developed by the contractor are reasonable estimates of actual indirect cost rates.

As you prepare your plan, your analysis of risk to the Government should include questions such as the following:
- Is there an existing Forward Pricing Rate Agreement (FPRA) or Forward Pricing Rate Recommendation (FPRR)?
- Can you obtain information from a recent indirect cost rate audit?

Audit information can greatly simplify the process of rate analysis when there is no FPRA or FPRR. However, an audit recommendation does not relieve the contracting officer from the responsibility to evaluate indirect cost rates. Contact the cognizant auditor to obtain information on any indirect cost rate audit performed within the last 12 months. When an audit is available, do not request a new indirect cost rate audit unless the contracting officer considers the previous audit inadequate for pricing the current contract. Reasons for requesting a new audit include:
- Substantial changes in the offeror's rate structure.
- Audit-identified weaknesses in the offeror's rate development and tracking procedures.
- Recent changes in the offeror's business volume.
- Recent changes in the offeror's production methods.
- Did your review of the indirect cost allocation cycle identify any inconsistencies in the relationship between related rates in the indirect cost allocation cycle?

Inconsistencies in the relationship between the proposed rates and related rates in the indirect cost allocation cycle may indicate that the offeror is not properly updating and reevaluating rates throughout the cycle.
- Did your review identify any apparent weaknesses in the indirect cost rate estimating process?

Any apparent weaknesses in the estimating process increases the cost risk to the Government. Normally, you should increase your analysis efforts in any areas with identified weaknesses.
- Have the offeror's estimates been accurate in the past?

Any contractor can incorrectly estimate an indirect cost rate. However, if past rates have been poor estimates of actual indirect costs, the risk to the Government is greater than it is in situations where past estimates have been quite accurate. As you plan, consider both the size and the consistency of the overestimates.

**For example:** The following table examines the accuracy of historical rate estimates made in the year prior to the rate period:

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
<th>Subtract Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projection Made</td>
<td>Projected For</td>
<td>Projected Rate</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td>19X5</td>
<td>19X6</td>
<td>259.1%</td>
</tr>
<tr>
<td>19X4</td>
<td>19X5</td>
<td>256.3%</td>
</tr>
<tr>
<td>19X3</td>
<td>19X4</td>
<td>260.0%</td>
</tr>
</tbody>
</table>

Note that the company overestimated this indirect cost rate in every year. The average overestimate was 1.8 percent, calculated as follows:

If all company contracts during those three years were priced using the company estimated rate, customers would have been charged an average of $101.80 for every $100 in actual costs.

- How many dollars are at risk?

Consider the cost of analysis and potential cost savings from the analysis. For example, it would make little sense to invest $30,000 in the analysis of a $20,000 indirect cost estimate.

- Does the indirect cost pool include a substantial amount of fixed cost?

As the percentage of fixed indirect costs increases, the risk associated with inaccurate allocation base estimates also increases. When a relatively high percentage of indirect costs are fixed, the indirect cost rate can change dramatically with any change in the allocation base. When most indirect costs are variable, changes in the allocation base will have a less dramatic affect on the indirect cost rate.

*Identify Unallowable Costs* (FAR 31.201-6). Costs that are expressly unallowable or mutually agreed to be unallowable must be identified and excluded from any proposal, billing, or claim related to a Government contract. When an unallowable cost is incurred, any cost related to its incidence is also unallowable.

Contractors must identify unallowable indirect costs whenever indirect cost rates are proposed, established, revised, or adjusted. The detail and depth of records required as rate support must be adequate to establish and maintain visibility of the indirect cost.

Any indirect cost analysis should specifically identify unallowable costs to assure proper treatment in indirect cost rate development:

- Unallowable costs must be removed from any indirect cost pool estimate, because Government contracts cannot include unallowable costs.

- When allocation base estimates include unallowable costs, the unallowable costs must be considered in Government rate projections to assure proper allocation of costs across all cost objectives.

Consider the following tests for cost allowability identified in the following table as you perform your analysis (FAR 31.205):

<table>
<thead>
<tr>
<th>Points to Consider When Analyzing Indirect Cost Allowability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If:</strong></td>
</tr>
<tr>
<td>The proposed indirect cost pool dollar amount is not reasonable</td>
</tr>
<tr>
<td>The proposed cost should have been treated as a direct cost (either against the proposed contract or another contract)</td>
</tr>
<tr>
<td>This cost belongs in a different category</td>
</tr>
</tbody>
</table>

| **Then:**                                                   |
| Reduce the dollar amount of the indirect cost pool to reflect a more reasonable dollar value for that item. |
| Subtract that cost from the total dollar value of the indirect cost pool, and ensure the cost is directly charged to the proper contract. |
| Subtract that cost from the }
indirect cost pool.  proposed indirect cost pool and add it to the dollar value of the correct pool.

The same cost is also represented in another indirect pool, or as a direct cost, or as part of an estimating factor (e.g., a packaging or obsolescence factor) Develop your pricing position recognizing the proposed cost in the area where the cost should be recognized and deleting it in the area where it should not be included in the proposal.

The proposed cost is not properly allocable, in part or in whole, to the pool under CAS or GAAP Reallocate the cost in a manner that is consistent with appropriate CAS or GAAP requirements.

The proposed cost is not allowable, in part or in whole, under the FAR cost principles Reduce the dollar amount of the indirect cost pool commensurably.

The proposed cost is not allowable, in whole or in part, under the terms and conditions of the contract

**Analyze the Allocation Base Estimate (FAR 31.203(b)).** The rate allocation base should be selected so as to permit allocation of the indirect cost pool to the various cost objectives on the basis of benefits accruing to each cost objective. The size of the estimate is important because most indirect cost pools include fixed costs. As the size of the base increases, the rate will decrease because the fixed expenses are being spread over a larger base. As the size of the base decreases, the rate will increase because the fixed expenses are being spread over a smaller base. The result of an inaccurate estimate can be demonstrated through the use of the following figure:

![Graph showing the relationship between direct labor and indirect costs](image)

The Applied Overhead line represents the negotiated indirect cost forward pricing rate (300% of direct labor dollars). The Budget Estimate line represents the firm's forecast of the pool at different levels of
production. Note the following characteristics of the two lines:

- The Applied Overhead line passes through the origin, because indirect costs can only be charged if product is produced and sold. (300% of nothing equals nothing.)

- The Budget Estimate line has a positive intercept at $10 million. In other words, Manufacturing Overhead includes $10 million in fixed costs.

- The two lines intersect at the direct labor estimate of $10,000,000 for the year—the point at which a 300% rate would recover the budgeted $30,000,000 in indirect costs.

Note that, if the base is anything other than $10 million, use of the 300 percent rate will not equal the budgeted indirect cost.

If the base were actually $5 million at the end of the period, the actual indirect cost should be $20 million (according to budget estimates). If indirect costs for all contracts had been estimated using the 300 percent rate, only $15 million would be applied (charged) to the contracts. Indirect cost would be under-applied by $5 million ($20 million - $15 million). If the contracts were all firm fixed-price, that $5 million would come out of the contractor's profits.

If the base were actually $15 million at the end of the period, the actual indirect cost should be $40 million (according to budget estimates). If indirect costs for all contracts had been estimated using the 300 percent rate, $45 million would be applied to the contracts. Indirect cost would be over-applied by $5 million ($45 million - $40 million). If the contracts were all firm fixed-price, the result would be $5 million in additional profit.

Consider questions such as the following as you analyze indirect cost allocation bases (FAR 31.203(e) and Appendix B, 9904.406-40):

- Did the offeror use the correct base period (e.g., one year)?

The base period for allocating indirect costs is the cost accounting period during which such costs are incurred and accumulated for distribution to work performed during that period. Generally the base period is the contractor's fiscal year. A shorter period may be appropriate:

- For contracts in which performance involves only a minor portion of the fiscal year,

- When it is general practice in the industry to use a shorter period, or

- During a transitional cost accounting period as part of a change in fiscal year.

When a contract is performed over several accounting periods, analyze the indirect cost allocation base for each rate for each accounting period covered by the contract.

- Does the indirect cost allocation base include all costs associated with that base during the accounting period, whether allowable or not?

Remember that unallowable costs must be excluded from any proposed indirect cost pool. However, all costs are part of the base—even the unallowables. For example, unallowable costs must be excluded from a manufacturing overhead pool. However, if manufacturing overhead is part of the allocation base for another indirect cost account (e.g., G&A expense) the unallowable costs must be added back into the base.

- Will the base result in a fair allocation of the costs in the indirect cost pool?

Indirect costs must be accumulated by logical cost groupings with due consideration of the reasons for incurring such costs. The base should be selected so as to permit allocation of the grouping on the basis of benefits accruing to the several cost objectives.

For example, if the pool is largely labor related (such as fringe benefits), the base should be a measure of labor effort, such as direct labor hours or dollars. If the pool is largely machinery related (such as depreciation and maintenance), the base should relate to machinery use, such as direct machine hours.

- When was the base estimate made?

If the offeror is estimating a base for the fiscal year, an estimate made mid-way through the fiscal year is likely to be more accurate than an estimate made at the beginning of the year. Likewise, an estimate made for the next fiscal year should normally be more reliable than an estimate for a period three years in the future.

- Does the sales volume used to estimate the allocation base appear reasonable?
The offeror does not have perfect knowledge of what is going to happen in the future. Estimators must consider more than known sales volume for the period in estimate development. Typically, the offeror will consider the following business forecast elements:

- Contracts in hand;
- Options that may be exercised;
- Proposals with a high probability of success [e.g., final proposal revisions (FPR)];
- Solicitations in hand; and
- Sales forecasts of future customer requirements;

Each element of the sales volume forecast should be assigned a probability of actual sale. Contracts in hand would be 100 percent. Other estimates would be assigned a lower “win” probability, based on an analysis of the probability of actually making the sale.

If the firm’s sales consist of only a few large Government contracts, place less faith in contractor statistical estimates, and more faith on the best expressions of Government plans. When the total business activity of the firm includes a large number of relatively small orders, give greater credence to statistical projections that appear reasonable, given the available data.

- Does the allocation base estimate appear reasonable for the projected sales volume?

Using historical data and other available information, determine if the proposed allocation base appears reasonable for the estimated sales volume. If you have any questions, seek information from the cognizant auditor or ACO.

- How stable has the allocation base been over time?

Particularly with respect to small businesses that are heavily dependent on a few contracts, the base may be quite unstable. If such a firm loses only one contract, indirect rates on its remaining contracts might skyrocket. That would be particularly significant for proposed cost-reimbursement contracts. You may need to consider contract terms to protect the Government from the risk of unexpected, substantial changes in burden rates.

*Convert the Base and Pool to Constant-Year Dollars.* To analyze the historical relationship between the indirect cost allocation base and the indirect cost pool, you need to consider the changing value of the dollar. Unfortunately, it may be impossible for you to adjust for inflation when you are performing a summary level analysis, because there is rarely a single price index that you can use to adjust an entire indirect cost pool for inflation/deflation. There are typically too many different types of cost and cost behaviors included in indirect cost pools. For example, during a period of general inflation, depreciation will decline unless the contractor acquires new depreciable assets. The price of gasoline for company cars may rise rapidly as the cost of office supplies is declining.

On the other hand, if you are performing a detailed analysis of individual elements of an indirect cost account, you should be able to identify one or more indexes to use in adjusting for the changing value of the dollar. If the contractor has adjusted costs for inflation and the contractor’s index number selection is reasonable, use it. If you have any concerns about the contractor’s adjustments for inflation, deal with them before proceeding with further analysis.

**For example:** The following actual costs for 19X3, 19X4, and 19X5 along with projected costs for 19X6 were taken from a contractor’s proposal for an indirect pool:

<table>
<thead>
<tr>
<th></th>
<th>19X3 (Actual)</th>
<th>19X4 (Actual)</th>
<th>19X5 (Actual)</th>
<th>19X6 (Projected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current-Year Dollars Pool</td>
<td>$2,502,490</td>
<td>$2,768,851</td>
<td>$3,110,004</td>
<td>$3,510,114</td>
</tr>
<tr>
<td>Base Pool</td>
<td>$1,154,650</td>
<td>$1,270,115</td>
<td>$1,397,115</td>
<td>$1,536,839</td>
</tr>
<tr>
<td>Rate</td>
<td>216.7%</td>
<td>218.0%</td>
<td>222.6%</td>
<td>228.4%</td>
</tr>
</tbody>
</table>
The following graph depicts the data presented in the above table. The solid lines depict independently the base and pool in current-year (unadjusted for inflation) dollars. The dotted lines depict the same information in constant-year (19X3) dollars.

<table>
<thead>
<tr>
<th>Constant-Year Dollars (Adjusted For Inflation)</th>
<th>Pool</th>
<th>Base</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$2,502,490</td>
<td>$1,154,650</td>
<td>216.7%</td>
</tr>
<tr>
<td></td>
<td>$2,590,650</td>
<td>$1,153,900</td>
<td>224.5%</td>
</tr>
<tr>
<td></td>
<td>$2,799,804</td>
<td>$1,156,500</td>
<td>242.1%</td>
</tr>
<tr>
<td></td>
<td>$2,996,000</td>
<td>$1,155,000</td>
<td>259.4%</td>
</tr>
</tbody>
</table>

Both the table and the graph show fluctuating base and pool dollars. However, inflation-adjusted data indicate that the inflation-adjusted indirect cost pool is increasing, while the inflation-adjusted allocation base is remaining relatively constant. Based on this analysis, it appears that inflation is masking real substantial growth in the rate.

Analyze the Pool/Base Relationship. Both the allocation base and indirect costs will normally change with increases or decreases in business activity. If you can determine the historic relationship between the allocation base and indirect costs, you can use that information to predict what the rate will be at various levels of the allocation base. If you can use regression analysis to quantify the relationship, you will be able to easily predict the indirect cost pool for any allocation base value.

You can analyze the overall relationship between the allocation base and the indirect cost pool, or examine the relationship between individual indirect cost accounts (e.g., office supplies) and the indirect cost allocation base. The following graph demonstrates application of this technique to the data on constant year dollars from the example on the previous page.
As you review the above graph, note that the proposed rate for 19X6 falls well above the value that you would project based on the historical base/pool relationship. When the contractor's estimate is substantially above or below the line, you should challenge the estimate. If the contractor refuses to reduce its rate and cannot explain the reasons for the difference, consider performing a more in-depth analysis.

As you examine the base/pool relationship, ask questions such as the following:

- Has the composition of the pool or base changed over time?
- Has the indirect cost rate structure changed from the structure used for past contracts?
- Are changes in the rate consistent with the mix of fixed and variable costs in the indirect cost pool?

A change in rate structure could result in costs being moved from one indirect cost pool to another. If your analysis indicates that changes have taken place ask the offeror for more information on the changes.

If the indirect cost pool is primarily composed of variable costs, the rate should be relatively insensitive to changes in the allocation base that result from changes in sales volume. If the indirect cost pool is primarily composed of fixed costs, the rate should be more sensitive to changes to such changes.

*Develop and Document Your Pricing Position.* Develop and document your prenegotiation position, using the results of your analysis:

- If you accept the offeror's indirect cost rate estimate, document that acceptance.
- If you do not accept the indirect cost rate estimate, document your concerns with the estimate and develop your own prenegotiation position for costs covered by the estimate.
If you can identify information that would permit you to perform a more accurate analysis of indirect cost rates, use the available information. Your analysis is not bound by the estimating methods used by the offeror.

2.5 Contract Forward Pricing

Indirect Cost Rates and Forward Pricing. One important use for indirect cost rate estimates is contract forward pricing. Contract pricing estimates of indirect costs for specific contracts and contract line items are developed by applying the estimated rate to the appropriate contract-related base. The indirect cost estimate will depend on both the rate and the size of the base related to contract performance. Forward Pricing Rates (FAR 15.404-1(c), FAR 15.404-2(a), and FAR 15.404-2(d)). An indirect cost forward pricing rate is a rate that is used in prospective contract pricing. Actually you may encounter several different forward pricing rates as you develop your contract pricing position.

- **Proposed Forward Pricing Rates.** These are the indirect cost pricing rates proposed by the contractor. Depending on the contractor's participation in negotiated Government contracts, the firm may prepare a separate rate proposal or include all data supporting the proposed rate as part of the contract pricing proposal. These rates are the starting point for indirect cost rate analysis and contract pricing.

- **Audit Recommended Rates.** These are rates developed by Government audit personnel as a result of their review of the contractor's indirect cost rate proposal. The recommendation may result from the audit of the current contract proposal, a recent (within the last 12 months) contract proposal, or a separate indirect cost rate proposal. These are important recommendations, because auditors are the only members of the Government Acquisition Team that have general access to the contractor's accounting records. However, they are recommendations. You are still responsible for evaluating contract price reasonableness.

- **Forward Pricing Rate Recommendations.** Forward Pricing Rate Recommendations (FPRRs) are formal rate recommendations developed by the cognizant ACO for all Government buying activities. FPRRs are generally developed with assistance from the cognizant Government auditor.

When a contractor has a high volume of Government pricing actions, ACOs should consider establishing an FPRR:

- When the contractor refuses to submit a forward pricing rate agreement (FPRA) proposal or enter into an FPRA;
- During the period between cancellation of one FPRA and the establishment of a replacement FPRA; or
- During the period between agreement on an FPRA by Government/contractor negotiators and formal execution of the agreement.

Although FPRRs are only recommendations, you should not develop an independent position without first contacting the contract administration office that issued the FPRR. The contract administration office should be able to supply information supporting the reasonableness of the recommended rate. When negotiating a contract or contract modification for which cost or pricing data are required, consider inviting the ACO that issued the FPRR and cognizant auditor to attend negotiations concerning indirect cost rates.

- **Forward Pricing Rate Agreements (FAR 15.407-3).** Negotiating indirect rates tends to be time consuming and contentious. At contractor locations with significant Government business, the cognizant administrative contracting officer (ACO) should attempt to negotiate an FPRA.
  - An FPRA is a formal bilateral agreement that binds the contractor to propose the negotiated rates and the Government to accept them in pricing individual contracts. Each agreement includes provisions for canceling all or a portion of the agreement if circumstances change and the rate(s) are no longer valid representations of future costs.

The following process was used to develop the contract cost estimate presented above using the proposed 19X7 indirect cost rates:
• Estimate direct material and direct labor costs to perform the proposed contract, using appropriate estimating techniques.

• Multiply the proposed Material Dollar base by the Material Overhead Rate (9.6%), resulting in a contract Material Overhead estimate of $19,200.

• Multiply the proposed Engineering Labor Dollar base by the Engineering Overhead Rate (64.7%), resulting in a contract Engineering Overhead estimate of $3,235.

• Multiply the proposed Manufacturing Labor Dollar base by the Manufacturing Overhead Rate (250.8%), resulting in a contract Manufacturing Overhead estimate of $188,100.

• Total the proposed production input costs ($490,535).

• Multiply Total Cost Input by the proposed G&A Expense rate (19.0%), resulting in a contract G&A Expense estimate of $93,202.

• Add the estimated G&A Expense dollars to the Total Cost Input, resulting in a total proposed cost of $583,737.

Caution -- Assure that the Indirect Cost Rate Is Applied to the Appropriate Base
Apply each indirect cost rate to the appropriate allocation base. For example, if the direct labor costs from three departments—machining, fabricating, and assembly—are the base for the manufacturing overhead rate, you must multiply the sum total of all machining, fabricating, and assembly direct labor costs by the manufacturing overhead rate to estimate manufacturing overhead dollars.
On the other hand, do not apply the manufacturing overhead rate to cost categories not included in the base. You would not apply manufacturing overhead to field service labor cost if field service labor costs were not part of the allocation base used in developing the rate. Only apply overhead rates to those elements included in the appropriate indirect cost allocation base.

Sources of Estimate Differences. Differences between the contractor's estimate of indirect costs and your estimate can come from two sources—rate differences and proposed contract allocation base differences. You need to be aware of the sources of cost differences as you prepare for contract negotiations.
Remember that even if you accept the contractor's proposed rate, your indirect cost objective will be lower than the costs proposed, if the base you are using is lower than the contractor's proposed base.

2.6 Contract Billing
This section examines factors that you should consider when establishing billing rates, adjusting billing rates, or evaluating costs related to contractor requests for progress payments or cost reimbursement.

• 2.6.1 Establishing Billing Rates
• 2.6.2 Adjusting Billing Rates
• 2.6.3 Disallowing Contractor Costs

Need for Billing Rates. Analysis of indirect costs during contract pricing provides a snapshot of the indirect cost rate structure at one point in time during the Indirect Cost Cycle. However, that snapshot is only one estimate of indirect cost rates. That estimate could change at any time, as new information becomes available, until the accounting period is complete and rates are final.
For firm fixed-price contracts without progress payments, the contract price is fixed and it will not be affected by changes in the indirect cost rates. As a result, the responsibility for monitoring rates during contract performance rests with the contractor.
For firm fixed-price contracts with progress payments based on cost, the contract price is fixed but the amount of individual progress payments will depend in part on the indirect cost rates used for progress payment billing. For fixed-price incentive contracts and cost-reimbursement contracts, the amount paid during contract performance (progress payments and cost-reimbursement) will depend in part on the indirect cost rates used for billing. In these cases, the Government must establish and monitor billing rates.

2.6.1 Establishing Billing Rates
Billing Rate Definition (FAR 42.701 and FAR 42.704(a)). The contracting officer (other cognizant Federal agency official) or auditor responsible for determining final indirect cost rates is responsible for
determining the contract billing rate. A billing rate is an indirect cost rate established temporarily for interim reimbursement of incurred indirect costs and adjusted as necessary pending the establishment of final indirect cost rates.

**Importance of a Reasonable Billing Rate.** A billing rate that is too high will result in increased progress payments and cost reimbursement. The contractor will have the use of the Government's money interest-free until final contract pricing. For contracts that provide for price adjustment based on contract costs, estimates of final contract price will be inflated. That inflation could lead to poor management decisions to control costs or assure performance within available funds.

A billing rate that is too low will result in decreased progress payments and cost reimbursement. Contract performance may be affected by funds shortages. Contractor profits may be affected by the need to borrow to cover funds shortages and low profitability may drive firms away from Government contracting.

**Basis for Rate Development** *(FAR 42.704(b)).* If you are responsible for establishing interim billing rates, you may establish rates based on information resulting from recent review, previous rate audits or experience, or similar reliable data or experience or other contracting activities.

If you determine that the dollar value or contracts requiring the use of billing rates does not warrant submission of a detailed billing rate proposal, you may establish rates by making appropriate adjustments from the prior year's indirect cost rate experience to:

- Eliminate unallowable and non-recurring costs, and
- Reflect new or changed conditions.

**Billing Rate Development** *(FAR 42.704(b)).* The billing rate should be as close as possible to your projection of the contractor’s final indirect cost rate for the period, adjusted for any unallowable costs.

- If the proposal is based on detailed data, complete a detailed proposal analysis following the steps previously outlined in this chapter. In fact, you should normally consider billing rates and forward pricing rates at the same time.

- As you determine the billing rate, consider:
  - Information resulting from recent review of contractor indirect cost rates;
  - The results of previous audits;
  - Your office's experience with the contractor; and
  - Similar reliable data or experience of other contracting activities.

- In making any required adjustments, consider all available data and apply appropriate quantitative techniques. Indirect cost experience from at least three accounting years and the use of regression analysis can be particularly useful in identifying non-recurring costs and making adjustments related to projected changes in production volume.

- Typically, billing rates should be the same as or slightly lower than current forward pricing rates.
  - When your analysis indicates a high probability that forward pricing rates are accurate estimates of final indirect costs, billing rates should normally be the same as current forward pricing rates.
  - When market or company uncertainty increase the risk that final indirect cost rates will be lower than current forward pricing rates, billing rates should normally be slightly lower than forward pricing rates. That will reduce the probability that the contractor will owe the Government money, when final indirect cost rates are determined.

### 2.6.2 Adjusting Billing Rates

**Adjusting Rates When Forecasts Change** *(FAR 42.704(c)).* Once billing rates are established, they may be prospectively or retroactively revised by mutual agreement of the responsible Government official and the contractor at either party's request, to prevent substantial overpayment or underpayment. Either the Government or the contractor may initiate a rate revision to prevent substantial overpayment or underpayment.

- If you are the contracting officer (or other cognizant Federal agency official) responsible for rate determination, consider initiating action to change billing rates whenever there is a change in final
indirect cost rate forecasts. Initiate action when it appears that the projected rate change will have a substantial effect on final Government contract cost. When you cannot reach agreement with the contractor, you may unilaterally determine billing rates.

- When the contractor provides a certified final indirect cost rate proposal, you and the contractor may agree to revise billing rates to reflect the proposed indirect cost rates, as approved by the Government to reflect historically disallowed amount from prior year’s audits, until the proposal has been audited and settled. The historical decrement will be determined by the cognizant contracting officer or the cognizant auditor.

**Variances Causing Rate Changes.** Remember that an indirect cost rate is the result of a simple calculation:

\[
\text{Indirect Cost Rate} = \frac{\text{Indirect Cost Pool}}{\text{Indirect Cost Allocation Base}}
\]

Using this equation, you can see that the rate will change if the indirect cost pool or the base change. Changes typically result from spending variances (e.g., an unexpected insurance rate increase) not related to changes in volume and volume variances (i.e., a decrease in electricity use related to a decrease in production).

- **Spending Variances.** An in-depth analysis of contractor accounting data is normally needed to identify all but the largest spending variances. For example, monthly costs (the prime indicator of spending variances) may need to be seasonalyzed to reflect normal cost patterns (e.g., direct hours down and paid absence up during December when most people are off for the holidays).

- Because of the need for accounting expertise, cognizant Government auditor (as the Government’s accounting expert) normally assume a lead role in identifying and analyzing spending variances.

- Multifunctional support is often required from other members of the Government Acquisition Team, because a single contractor management decision can affect spending across a broad range of contractor operations.

**For example:** A substantial change in capital improvement spending could reasonably be expected to affect:

- Projected depreciation expense (an indirect cost element);
- Facilities Capital Cost of Money Factors calculated under Cost Accounting Standard 414; and
- Contractor operations (e.g., worker productivity, make-or-buy decisions).

- **Volume Variances.** Any substantial differences between estimated rate base and actual base will result in a change in indirect cost rates, no matter how accurately costs have been predicted for the estimated volume.

- Because day-to-day contracting activities (e.g., contract awards, changes, or terminations) provide the data essential for identification of volume variances, your observation and analysis of volume changes are particularly important.

- Consider any variances from volume estimates used in developing billing rates, including changes in:
  - Contracts in hand;
  - Options that may be exercised;
  - Proposals with a high probability of success;
  - Solicitations in hand;
  - Sales forecasts of future customer requirements; or
  - Projected increases or decreases in inventory.

**Adjusted Billing Rate Development (FAR 42.704(b)).** When adjusting billing rates, consider how identified
spending and volume variances will affect your estimates of final indirect cost rates. Remember that the billing rate should be as close as possible to your projection of the contractor's final indirect cost rate for the period, adjusted for any unallowable costs.

Recalculate Contract Costs Using the Adjusted Rates (FAR 42.704). When it is necessary to adjust billing rates to prevent substantial overpayment or underpayment, you should adjust contract costs using the following procedure as depicted in the table below.

- **Determine The Amounts Paid Under The Contract.** Determine the costs previously reimbursed or paid as progress payments.

- **Calculate Total Amounts Due Using The Adjusted Rates.** Calculate the total reimbursement or progress payment amount due the contractor using the adjusted billing rates for the entire accounting period. If total contract costs include costs from other accounting periods, assure that you only adjust costs for the period affected by the rate adjustment.

- **Calculate The Net Amount Due The Contractor.** Subtract the costs previously reimbursed or paid as progress payments from the total amount calculated using the adjusted rates. The net difference is the amount currently due the contractor. If the net difference is positive, reimburse the contractor accordingly. If the net difference is negative, the contractor has been over-reimbursed and you should take appropriate action in accordance with agency procedures.

### Contract Cost Reimbursement

<table>
<thead>
<tr>
<th>Costs Previously Reimbursed</th>
<th>Costs To Date Using Current Billing Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material Cost</td>
<td>$100,000 Direct Material Cost $120,000</td>
</tr>
<tr>
<td>Material Overhead @ 8.6%</td>
<td>$8,600 Material Overhead @ 8.2% $9,840</td>
</tr>
<tr>
<td>Direct Labor Cost</td>
<td>$200,000 Direct Labor Cost $275,000</td>
</tr>
<tr>
<td>Labor Overhead @ 130.0%</td>
<td>$260,000 Labor Overhead @ 132.0% $363,000</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$568,600 Subtotal $767,840</td>
</tr>
<tr>
<td>G&amp;A Expense @ 14.0%</td>
<td>$79,604 G&amp;A Expense @ 12.5% $95,980</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$648,204 Total Cost $863,820</td>
</tr>
<tr>
<td>Subtract Costs Previously Reimbursed from Costs to Date</td>
<td>$648,204</td>
</tr>
<tr>
<td>Balance Due the Contractor</td>
<td>$215,616</td>
</tr>
</tbody>
</table>

### 2.6.3 Disallowing Contractor Costs

**Allowability of Contractor Costs (FAR 42.803).** To be properly invoiced to a Government contract, a cost must be allowable. Remember that a cost is considered allowable under a specific contract if it is:

- Reasonable,
- Allocable to the contract,
- Properly accounted for under applicable accounting principles and standards,
- Not identified as unallowable under specific cost principles, and
- Not identified as unallowable under the terms of the contract.

**Situations for Using a Notice of Intent to Disallow Costs (FAR 42.801, and FAR 42.802).** Include the FAR clause **52.242-1**, Notice Of Intent To Disallow Costs, in any solicitation or contract whenever you contemplate using a cost-reimbursement contract, a fixed-price incentive contract, or a
contract providing for price redetermination. Under that clause, you, as the contracting officer responsible for contract administration, may issue a Notice Of Intent To Disallow Costs incurred or planned for incurrence at any time during contract performance. However, before issuing the notice, you must make every reasonable effort to reach a satisfactory agreement through discussions with the contractor.

Do not use a Notice Of Intent To Disallow Costs to disallow invoiced costs. Only use the notice to advise the contractor as early as practicable during contract performance that a specific cost or type of cost is considered unallowable under the contract terms and to provide for timely resolution of any resulting disagreement.

Process for Using a Notice of Intent to Disallow Costs (FAR 42.801 and FAR 52.242-1). Normally, the process of cost review and disallowance involves seven steps. However, your objective should be to obtain satisfactory resolution without actually completing all seven steps.

- **Identify Any Unallowable Cost.** The unallowable cost is usually identified through routine audit or cost monitoring activities of the contract administration team.
  - If the cognizant auditor identifies a cost as unallowable, assure that you understand the reason before proceeding further.
  - If you identify the cost as unallowable, you should coordinate your findings with the cognizant auditor before taking further action.

- **Attempt To Negotiate A Satisfactory Settlement.** Attempt to negotiate a satisfactory settlement through discussions with the contractor. To the extent practicable, coordinate with the cognizant auditor throughout the negotiation process.

- **Prepare a Notice Of Intent To Disallow Costs.** If you cannot reach agreement with the contractor, prepare the notice. As a minimum, the notice must:
  - Refer to the contract's Notice Of Intent To Disallow Costs clause;
  - State the contractor's name and list the numbers of the affected contracts;
  - Describe the costs to be disallowed, including estimated dollar value by item and applicable time periods, and state the reasons for the intended disallowance;
  - Describe the potential impact on billing rates and forward pricing rate agreements (FPRAs);
  - State the notice's effective date and the date by which written response must be received;
  - List the recipients of copies of the notice; and
  - Request the contractor to acknowledge receipt of the Notice.

- **Obtain Necessary Coordination.** Prior to issuing a notice affecting elements of indirect cost, coordinate the notice with the contracting officer responsible or auditor responsible for final indirect cost settlement. In the DoD, a corporate administrative contracting officer does not need to obtain the approval of individual ACOs to disallow items of corporate expense (FARS 42.801).

- **Distribute The Notice Of Intent To Disallow Costs.** Send the notice to the contractor and obtain acknowledgment of receipt. In addition, provide copies of the notice to all contracting officers cognizant for any segment of the contractor's organization.

- **Act On Any Contractor Response.** If the contractor accepts the notice, no further action is necessary. If the contractor believes that the cost is allowable, it may submit a written response. You must act on that response within 60 days.
  - If the contractor provides convincing evidence that the cost is allowable, withdraw the Notice in writing.
  - If the contractor fails to provide convincing evidence that the cost is allowable, issue a written decision under the contract Disputes clause disallowing the cost.
If the contractor provides convincing evidence that part of the cost is allowable, issue a decision under the contract Disputes clause that a portion of the cost is not allowable.

- Distribute Resulting Documents.
  - Distribute the original copy of your action to withdraw a Notice Of Intent To Disallow Costs or a final decision to disallow costs to the contractor.
  - Distribute copies to all contracting officers cognizant of any segment of the contractor's organization.

**Situations for Disallowing Incurred Costs (FAR 42.803).** Cost-reimbursement contracts, the cost-reimbursement portion of fixed-price contracts, letter contracts that provide for reimbursement of costs, time-and-material contracts, and labor-hour contracts provide for disallowing costs during the course of performance after costs have been incurred.

**Contracting Officer Procedures for Disallowing Incurred Costs (FAR 42.803(a), DFARS 225.870-5, DFARS 242.803, and DEAR 942.803(a)).**

When you, as a contracting officer, receive vouchers directly from the contractor and, with or without auditor assistance, approve or disapprove them, conduct the process of disallowing costs in accordance with normal agency procedures. The following are two examples of agency procedures:

- **In the DoD,** contracting officer receipt of cost vouchers is only authorized for cost-reimbursement contracts with the Canadian Commercial Corporation (CCC).
  - Audits are automatically arranged by the Department of Supplies and Services (DSS), Canada.
  - Based on advice from DSS, the CCC will certify the invoice and forward it with the SF 1034, Public Voucher, to the ACO for further processing and transmittal to the disbursing office.
- **In DOE,** all vouchers and invoices are submitted to the contracting officer (or designee) for review and approval. If the examination raises a question concerning allowability of cost, the contracting officer must:
  - Hold informal discussions with the contractor as appropriate.
  - Issue a notice (e.g., letter or memo) to the contractor advising of the cost disallowed or to be disallowed and advising the contractor that it may:
  - Submit a written claim as to why the cost should be reimbursed, if it does not concur with the disallowance.
  - File a claim under the contract Disputes clause, which will be processed in accordance with disputes procedures if agreement cannot be reached.
  - Process the invoice or voucher for payment and advise the finance office to deduct the disallowed cost when scheduling the voucher for payment.

When authorized by agency regulations, the cognizant auditor may be authorized to (FAR 42.803(b) and DCAM 6-902c):

- Receive cost-reimbursement vouchers.
- Approve for payment those vouchers found to acceptable and forward them to the cognizant contracting, finance, or disbursing officer for payment, following agency procedures.
- Suspend payment of questionable costs.

If the auditor's examination of a voucher raises a question regarding the allowability of an invoiced cost, the auditor will follow agency procedures for disallowing that cost. Those procedures will generally include steps such as the following:

- **Withhold Payment Processing Pending Resolution.** The auditor will not process an invoice or voucher which includes a questioned cost until the issue of allowability is resolved.
- **Advise Cognizant Contracting Officer Of Pending Action.** The auditor will normally keep the
cognizant contracting officer apprised of the issues affecting cost allowability. If you are the
cognizant contracting officer, provide the auditor with any available information which might
support, refute, or modify the auditor's findings.

- **Conduct Informal Discussions With The Contractor.** The auditor may conduct informal
discussions with the contractor to ensure that the auditor's conclusion is based on a proper
understanding of the facts.
  - If the contractor convinces the auditor that the cost is allowable, the auditor will process
    the invoice or voucher for payment.
  - If the auditor convinces the contractor that the cost is unallowable, the auditor will
    normally permit the contractor to resubmit the invoice or voucher without the questioned
cost.
  - If the auditor remains convinced that the cost is unallowable, but the contractor does not
    agree, the auditor should proceed to the next step below.

- **Issue Notice of Contract Costs Suspended and/or Disapproved.** If the auditor still believes
  that the cost is unallowable and is authorized to take this step under agency procedures, the
  auditor will issue a Notice of Contract Costs Suspended and/or Disapproved (e.g., a DCAA Form
1). The notice should identify claimed costs that are not considered reimbursable.

- **Distribute Notice of Contract Costs Suspended and/or Disapproved.** The auditor should distribute
  the notice simultaneously:
  - To the contractor (with a request for acknowledgment of contractor receipt
  - To the disbursing officer, with a copy
  - To the cognizant contracting officer.

- **Review Contractor Response.** If the contractor disagrees with the deduction from current
  payments, the contractor may:
  - Submit a written request for you, as the cognizant contracting officer, to consider whether
    the unreimbursed cost should be paid and to discuss the finding with contractor
    personnel.
  - File a claim under the Disputes clause.
  - Do both of the above.

- **Act On Any Contractor Claim.** When the contractor submits a claim under the Disputes clause
  of the contract, the contracting officer must issue a written decision as soon as practicable within
the 60-day period required by the Disputes clause. If the contractor still disagrees, the firm may
appeal to the appropriate Board of Contract Appeals or the Claims Court.

### 2.7 Determining Final Indirect Costs

This section examines factors that you should consider when establishing and applying final indirect cost
rates.

- **2.7.1 - Establishing Final Rates**
- **2.7.2 - Establishing Quick Closeout Rates**
- **2.7.3 - Obtaining And Reviewing Completion Invoices/Vouchers**
- **2.7.4 - Assessing Penalties For Unallowable Costs In Final Rate Proposals**

#### 2.7.1 Establishing Final Rates

**Final Indirect Cost Rates (FAR 42.701).** A final indirect cost rate is a rate established and agreed upon by
the Government and the contractor. It is not subject to change. It is usually established after the close of
the contractor's fiscal year (unless the parties decide on a different period) to which it applies. In the case
of cost-reimbursement contracts with educational institutions, the rate may be predetermined (i.e.,
established for a future period) on the basis of cost experience with similar contracts, together with supporting data.

**Indirect Cost Rate Proposal** (FAR 42.703-2, FAR 52.216-7(d), FAR 52.216-13(c), and FAR 52.242-4). Each flexibly priced contract requires the contractor to submit proposed final indirect cost rates for each fiscal year, within six months after the expiration of its fiscal year (or by a later date under exceptional circumstances approved in writing by the contracting officer). The proposal must:

- Be submitted to the cognizant contracting officer (or cognizant Federal agency official) and auditor;
- Be based on the Contractor's actual cost experience for the period;
- Include adequate supporting data; and
- Include the Certificate of Final Indirect Costs described below unless the requirement is waived by the agency head (or designee).

**Format for Certificate of Final Indirect Costs** (FAR 52.242-4). To be acceptable, the completed certificate must read as shown below and be signed by an individual in the contractor's organization at a level no lower than vice president or chief financial officer of the business segment that submits the proposal:

<table>
<thead>
<tr>
<th>CERTIFICATE OF FINAL INDIRECT COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is to certify that I have reviewed this proposal to establish final indirect cost rates and to the best of my knowledge and belief:</td>
</tr>
<tr>
<td>1. All costs included in this proposal (identify proposal and date) to establish final indirect cost rates for (identify period covered by rate) are allowable in accordance with the Federal Acquisition Regulation (FAR) and its supplements applicable to the contracts to which the final cost rates will apply; and</td>
</tr>
<tr>
<td>2. This proposal does not include any costs which are expressly unallowable under applicable cost principles of the FAR or its supplements.</td>
</tr>
<tr>
<td>Firm: _________________________________</td>
</tr>
<tr>
<td>Signature: ____________________________</td>
</tr>
<tr>
<td>Name of Corporation Official: __________</td>
</tr>
<tr>
<td>Title: ________________________________</td>
</tr>
<tr>
<td>Date of Execution: _____________________</td>
</tr>
</tbody>
</table>

**Failure to Submit a Certificate of Final Indirect Costs** (FAR 42.703-2(c)). If the contractor has not certified its proposal for final indirect cost rates and a waiver is not appropriate, the contracting officer may unilaterally establish the final indirect cost rates. In such situations, the responsible contracting officer should:

- Base the unilaterally-determined final indirect cost rate on audited historical data or other available data after excluding unallowable costs; and
- Set the unilaterally-determined rate low enough to ensure that unallowable costs will not be reimbursed.

**False Certification** (FAR 42.703-2(d)). Consult with Government legal counsel to determine appropriate action if you think that a contractor's Certificate of Final Indirect Costs is false. **Waiver of Final Indirect Cost Proposal Certification Requirement** (FAR 42.703-2(b)). The agency head (or designee) may waive the indirect cost certification requirement when:

- A waiver is determined to be in the best interest of the United States, and
- The reasons for the determination are put in writing and made available to the public.

A waiver may be appropriate for a contract with a:

- Foreign government or international organization, such as subsidiary bodies of the North Atlantic Treaty Organization;
- State or local government that is subject to OMB Circular A-87; Cost Principles for State and Local Governments;
- Educational institution subject to OMB Circular A-21, Cost Principles for Educational Institutions;
Responsibility for Determining Final Indirect Cost Rates (FAR 42.705 and DEAR 942.705-1(a)(3)). Final indirect costs must be established by using either the:

- Contracting officer determination procedure; or
- Auditor determination procedure.

Select the appropriate procedure following the guidelines below and applicable agency requirements. For example, the Department of Energy Acquisition Regulation (DEAR) directs the use of the contracting officer determination procedure for all final rates set by the Department of Energy.

Situations for Contracting Officer Determination (FAR 42.705-1(a)). Use the contracting officer determination procedure for business units:

- Of a multidivisional corporation under the cognizance of a corporate administrative contracting officer (CACO).
  - The CACO will be responsible for the rate determination.
  - Administrative contracting officers (ACOs) assigned to the individual business units will assist the CACO (as required).
  - Negotiations may be conducted on a coordinated or centralized basis, depending on the degree of centralization within the contractor's organization.

- Not under the cognizance of a CACO, but having a resident ACO. The resident ACO will be responsible for the determination. For this purpose, a nonresident ACO is considered as resident if at least 75 percent of the ACO's time is devoted to a single contractor.

- Not included above, when the contracting officer (or cognizant Federal agency official) determines that a contracting officer determination is appropriate under FAR and agency procedures.

Procedure for Contracting Officer Rate Determination (FAR 42.705-1(b), FAR 52.216-7(d)(2), FAR 52.216-13(c)(2), DCAAP 7641.90, and DCAM 6-603a).

As a contracting officer determining final overhead rates for business units, follow the steps identified below. For other contractors, see the appropriate FAR sections identified above.

- **Obtain The Contractor's Proposal.** Each flexibly priced contract requires the contractor to submit proposed final indirect cost rates for each fiscal year, six months after the expiration of its fiscal year. The contracting officer may grant a reasonable written extension for exceptional circumstances when requested by the contractor. Assure that the contractor submits a separate copy of the proposal to the cognizant auditor. Chapter 6 of DCAA Pamphlet 7641.90, Information for Contractors, provides a model incurred cost proposal.

- **Obtain A Proposal Audit.** Follow your agency procedures to obtain an audit of the contractor's indirect cost rate proposal from the cognizant auditor. Your request for audit support should identify any areas where you believe audit input is necessary to support final rate determination.
  - FAR requires the cognizant auditor to identification of any relevant advance agreements or restrictive terms affecting final indirect cost rates. The auditor should provide an analysis of other areas affecting final rate determination.
  - The audit should also include:
    - A review and evaluation of the contractor's system of internal control, including the means by which all echelons of management control the level of indirect cost;
    - A review of the composition and suitability of the allocation bases;
    - A review of the composition of the various indirect cost pools to ascertain whether they are logical and bear a reasonable relationship to the bases used for apportioning
expenses to operations;
  o A review of selected indirect cost accounts;
  o A verification to the financial records; and
  o A verification of the mathematical accuracy of the rate computation.

- **Form A Government Negotiating Team.**
  - Include the:
    - Cognizant contracting officer (Team Head);
    - Cognizant auditor; and
    - Technical or functional personnel as required.
  - Invite contracting offices with significant dollar interest in the negotiations to participate in the negotiation and in the preliminary discussion of critical issues.
  - You should also invite individuals or offices that have provided significant input to the Government position.

- **Develop A Negotiation Position For Each Rate.** As you develop your negotiation position, seek relevant input from other members of the Government Negotiating Team. Do not resolve any questioned cost until you obtain:
  - Adequate documentation on the cost, and
  - The contract auditor's opinion on the allowability of the cost.

- **Conduct Negotiations With The Contractor.** Whenever possible, invite the contract auditor to serve as an advisor at any negotiation or meeting with the contractor. Request participation by other Government Negotiating Team members when needed to support negotiations.

- **Execute A Bilateral Final Indirect Cost Rate Agreement.** The bilateral agreement:
  - Should specify:
    - The agreed-upon final annual indirect cost rates,
    - The bases to which the rates apply,
    - The periods for which the rates apply,
    - Any specific indirect cost items treated as direct costs in the settlement, and
    - The affected contract(s) and/or subcontract(s), identifying any with advance agreements or special terms and the applicable rates.
  - Must not change any monetary ceiling, contract obligation, or specific cost allowance or disallowance provided for in any contract.
  - Is incorporated into each applicable contract upon execution.
  - Is binding on all agencies, unless otherwise specifically permitted by statute.

- **Prepare, Sign, And File A Negotiation Memorandum.** The memorandum must cover the following points:
  - The disposition of significant matters in the advisory audit report;
  - Reconciliation of all costs questioned, with identification of items and amounts allowed or disallowed in the final settlement, as well as period costing or allocation issues;
  - Reasons why any recommendations of the auditor or other Government advisors were not followed; and
Identification of cost or pricing data submitted during the negotiations and relied upon in reaching a settlement.

- **Distribute Resulting Documents** *(FAR 42.706)*.
  - Distribute the executed copies of the agreement to:
    - The contractor;
    - Each affected contracting agency; and
    - The affected contract files.
  - Distribute copies of the negotiation memorandum (as appropriate) to:
    - The affected contracting office(s); and
    - Cognizant Government audit office(s).

**Situations for Auditor Determination** *(FAR 42.705-2(a))*. The cognizant Government auditor must establish final indirect cost rates in situations other than those identified above for contracting officer determination. Audit determination may also be used in the situations designated for contracting officer (or cognizant Federal agency official) determination when the cognizant contracting officer and auditor agree that the indirect costs can be settled with little difficulty and any of the following circumstances apply:

- The business unit has primarily fixed-price contracts, with only minor involvement in cost-reimbursement contracts.
- The administrative cost of making a contracting officer determination would exceed the expected benefits.
- The business unit does not have a history of disputes and there are few cost problems.
- The contracting officer (or cognizant Federal agency official) and auditor agree that special circumstances require audit determination.

**Procedure for Auditor Determination** *(FAR 42.705-2(b))*. Under the auditor determination procedure assure that the contractor submits a final indirect cost rate proposal to both the cognizant auditor and the contracting officer. The auditor will:

- Audit the proposal and seek agreement on indirect costs with the contractor.
- Prepare a bilateral indirect cost rate agreement between the auditor and the contractor that conforms to the requirements of the contracts involved.
- Execute the bilateral agreement with the contractor.
- Distribute executed copies of the agreement to the contractor and to each affected contracting agency. The auditor will also provide copies of the audit report to the affected contracting offices and Government audit offices.

**Auditor and Contractor Fail to Agree** *(FAR 42.705-2(b)(2)(iii) and DFARS 242.705-2(b)(2)(iii))*.

If the auditor cannot reach agreement with the contractor, the auditor will forward the audit report to the contracting officer (or Federal agency official) designated in the Directory of Contract Administration Services Components for final indirect rate determination. Defense Contract Audit Agency Auditors will also issue a DCAA Form 1, Notice of Contract Costs Suspended and/or Disapproved. On the form, the auditor will detail the items of exception and advise the contractor that requests for reconsideration should be submitted in writing to the contracting officer.

**Government and Contractor Fail to Agree** *(FAR 52.216-7(d)(4) and FAR 52.216-13(c)(5))*.

If the contracting officer and the contractor fail to agree on a final indirect cost rate determination, that failure will be considered a dispute within the meaning of the contract Disputes clause. The dispute will be resolved under the provisions of that clause.

**2.7.2 Establishing Quick Closeout Rates**

**Rationale for Quick Closeout.** Final indirect cost rates cannot be determined until after the close of the
cost accounting period. In fact, it may take years to establish final indirect cost rates. To speed contract closeout, the contracting officer responsible for contract closeout may use the quick-closeout procedure to negotiate the settlement of indirect costs for a specific contract in advance of the determination of final contract cost.

**Criteria for Quick Closeout** (FAR 42.708). The table below delineates the criteria that you must consider in determining when and how to use the quick-closeout procedure to establish final contract indirect cost.

<table>
<thead>
<tr>
<th>Criteria For Use Of Quick Closeout Procedure</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract must be physically complete.</td>
<td>All deliverables under the contract have been received and accepted. Only administrative contract closeout remains.</td>
</tr>
</tbody>
</table>
| Unsettled indirect cost to be allocated must be relatively insignificant. | To be considered relatively insignificant:  
  * Total unsettled indirect cost cannot exceed $1,000,000 on any one contract, and  
  * Unless otherwise provided in agency procedures, cumulative unsettled indirect cost to be allocated through this procedure in any one year cannot exceed 15% of the estimated total unsettled indirect cost allocable to the contractor’s cost-type contracts for that fiscal year. |
| Agreement must be reached on a reasonable estimate of allocable dollars. | Both the contracting officer responsible for contract closeout and the contractor must agree to the indirect costs to be allocated to the contract. |
| Determination of final indirect costs under the quick closeout procedure must be final for the contract it covers. | Use of the rates is final for covered contracts and no adjustment shall be made to other contracts for over/under recovery of costs applicable to a contract covered by the agreement. |
| Quick closeout rates shall not be considered a binding precedent for other contracts. | While the rates are binding for any contract covered, they are not considered a binding precedent affecting the establishment of final indirect cost rates for other contracts. |

**Procedure for Quick Closeout Rate Development.** There is no guidance presented in the FAR as to how you should go about reaching reasonable quick closeout rates. However, the steps below present a framework that you can follow in negotiating a reasonable rate.

- **Obtain Contractor Final Rate Proposal.** While there is no FAR requirement to obtain a final rate proposal before negotiating quick closeout rates, the practical reality is that the only sound way to begin negotiations is with a contractor proposal, for several reasons:
  - It is difficult to negotiate rates without knowing the contractor’s position.
  - The proposal summarizes the contractor’s records on final indirect costs.
  - Requiring the proposal for quick closeout incentivizes timely submission of a proposal that can be used for final rate negotiations.

- **Develop Negotiation Objective.** Based on the contractor’s proposal, develop a negotiation objective.
  - Normally, you will develop the objective without detailed audit or technical analysis. However, you should contact the cognizant auditor to determine if the auditor is currently aware of any substantial exceptions to the contractor’s proposed rates.
Assuming that no substantial exceptions are noted, you can develop your objective using any reasonable approach including the following:

- Adjust the proposed final settlement rate using a decrement factor developed from analysis of forward pricing and billing rates. It is reasonable to assume that the final audit will identify reductions similar to reductions noted in forward pricing and billing rate proposals.
- Adjust the proposed final settlement rate using a decrement factor based on prior-year reductions from proposed settlement rates. The adjustment can be based on audit-recommended reductions, negotiated reductions, or some combination of the two.

**Negotiate a Reasonable Rate.** Remember the goal is to obtain a reasonable rate.

- The contractor may be willing to settle for a rate slightly lower than it might otherwise negotiate to obtain its money immediately.
- On the other hand, it may be advantageous to the Government to settle for a rate slightly higher than it might otherwise negotiate to reduce the administrative costs of retaining an active contract that is physically complete.

**Sign a Bilateral Agreement.** Sign a bilateral agreement with the contractor documenting:

- The rates.
- The contracts to which the rates apply.
- That the use of the quick closeout rate is final for the contracts involved, and that differences between the quick closeout rates and final settlement rates cannot be shifted to other contracts.
- That agreement on quick closeout rates does not set a binding precedent affecting the establishment of final indirect cost rates for other contracts.

**Distribute the Agreement.** Promptly distribute the agreement to the contractor and each contracting official affected.

**Prepare a Negotiation Memorandum.** Prepare a memorandum documenting data considered during negotiations and the basis for your objective and the rates negotiated.

### 2.7.3 Obtaining And Reviewing Completion Invoices/Vouchers

**Obtaining Completion Invoices/Vouchers (FAR 42.705(b), FAR 52.216-7, and FAR 52.216-13).** Within 120 days after settlement of the final indirect cost rates or quick closeout rates covering the year in which a contract is physically complete (or longer, if approved in writing by the contracting officer), the contractor must submit a completion invoice or voucher to reflect the settled amounts and rates. Typically, the data supporting the updated invoice or voucher will identify the:

- Total contract cost;
- Total previously billed; and
- Balance due or credit due.

The following example illustrates what the support for an updated cost-reimbursement voucher might look like.

<table>
<thead>
<tr>
<th>Costs Reimbursed Using Interim Billing Rates</th>
<th>Final Costs Using Final Indirect Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Material Cost</td>
<td>$800,000</td>
</tr>
<tr>
<td>Material Overhead @ 8.2%</td>
<td>$65,600</td>
</tr>
<tr>
<td></td>
<td>$800,000</td>
</tr>
<tr>
<td></td>
<td>$67,200</td>
</tr>
</tbody>
</table>
Completion Invoice/Voucher Review (FAR 42.803). Follow agency procedures in reviewing completion invoices/vouchers. Auditor assistance in your review may be appropriate to assure that all costs are allowable and in accordance with the appropriate final indirect cost rate determination or quick closeout rate agreement.

### 2.7.4 Assessing Penalties For Unallowable Costs In Final Rate Proposals

**Contracts Where Penalty Requirements Apply (FAR 42.709).** The contracting officer has the general authority to assess a financial penalty against a contractor that includes unallowable indirect costs in:

- A final indirect cost rate proposal; or
- The final statement of costs incurred or to be incurred under a fixed-price incentive contract.

However, this authority does not apply to:

- Contracts that do not exceed $500,000;
- Fixed-price contracts without cost incentives; or
- Firm fixed-price contracts for the purchase of commercial items.

**Contracting Officer Responsibilities (FAR 42.709-2(a)).** The cognizant contracting officer is responsible for:

- Determining whether penalties should be waived;
- Determining whether a penalty should be assessed;
- Assessing the appropriate penalty;
- Referring the matter to the appropriate criminal investigative organization for review and for appropriate coordination of remedies, if there is evidence that the contractor knowingly submitted unallowable costs.

**Auditor Responsibilities (FAR 42.709-2(b)).** The cognizant contract auditor, is responsible for:

- Recommending to the contracting officer which costs may be unallowable and subject to the penalties;
- Providing rationale and supporting documentation for any recommendation; and
- Referring the matter to the appropriate criminal investigative organization for review and for appropriate coordination of remedies, if there is evidence that the contractor knowingly submitted unallowable costs.

**Penalty Amount (FAR 42.709-1).** It is not necessary for unallowable costs to have been paid to the
The penalties summarized in the table below may be applied in addition to other administrative, civil, and criminal penalties provided by law.

<table>
<thead>
<tr>
<th>If the indirect cost...</th>
<th>The penalty is equal to:</th>
</tr>
</thead>
</table>
| Is expressly unallowable under a cost principle in the FAR, or an executive agency supplement to the FAR, that defines the allowability of specific selected costs | • The amount of the disallowed costs allocated to applicable contracts based on the indirect cost proposal; plus  
• Interest on the paid portion (if any) of the disallowance. |
| Was determined to be unallowable for that contractor before proposal submission | • Two times the amount of the disallowed costs allocated to applicable contracts based on the indirect cost proposal; plus  
• Interest on the paid portion (if any) of the disallowance. |

Evidence That a Cost Was Determined to Be Unallowable Before Proposal Submission (FAR 42.709-3(b)).
A prior determination of unallowability may be evidenced by any of the following:
- A DCAA Form 1, Notice of Contract Costs Suspended and/or Disapproved, or any similar notice which the contractor elected not to appeal and was not withdrawn by the cognizant Government agency;
- A contracting officer’s final decision which was not appealed by the contractor;
- An executive agency Board of Contract Appeals or court decision involving the contractor, which upheld the cost disallowance; or
- A contracting officer determination or Government-contractor agreement of unallowability.

Computing Interest Due the Government (FAR 42.709-4). Compute interest on any portion of the unallowable cost already paid by the Government as follows:
- Consider the overpayment to have occurred, and interest to have begun accumulating, from the midpoint of the contractor fiscal year covered by the indirect cost proposal. Use an alternate equitable method if the cost was not paid evenly over the fiscal year.
- Use the interest rate specified by the Secretary of the Treasury pursuant to Public Law 92-41 (85 Stat. 97), available online at the Treasury Department’s Bureau of Public Debt website.
- Compute interest from the date of overpayment to the date of the demand letter for payment of the penalty.
- Determine the paid portion of the disallowed costs in consultation with the cognizant contract auditor.

Demand for Payment (FAR 42.709-3). Unless the penalty requirements outlined above are waived, the cognizant contracting officer must issue a demand for payment of the appropriate penalty amount plus interest on the overpayment. This demand for payment is a final decision under the Disputes clause of the contract.
The demand for payment of the penalty is separate from and in addition to any demand for repayment of a disallowed cost previously paid by the Government.

**Waiver of the Penalty (FAR 42.709-5).** Waive the penalties above when:

- The contractor withdraws the proposal before the Government formally initiates an audit of the proposal and the contractor submits a revised proposal (an audit will be deemed to be formally initiated when the Government provides the contractor with written notice, or holds an entrance conference, indicating that audit work on a specific final indirect cost proposal has begun);
- The amount of the unallowable costs under the proposal which are subject to the penalty is $10,000 or less (i.e., if the amount of expressly or previously determined unallowable costs which would be allocated to the contracts specified is $10,000 or less); or
- The contractor demonstrates, to the contracting officer's satisfaction, that:
  - It has established policies and personnel training and an internal control and review system that provide assurance that unallowable costs subject to penalties are precluded from being included in the contractor's final indirect cost rate proposals. Evidence of such controls include:
    - The types of controls required for satisfactory participation in the Department of Defense sponsored self-governance programs,
    - Specific accounting controls over indirect costs,
    - Compliance tests which demonstrate that the controls are effective, and
    - Government audits which have not disclosed recurring instances of expressly unallowable costs); and
  - The unallowable costs subject to the penalty were inadvertently incorporated into the proposal (i.e., their inclusion resulted from an unintentional error, notwithstanding the exercise of due care).

- 3.1 - **Reviewing Accounting Systems**
- 3.2 - **Establishing The Government's Position On CAS Cost Impact Adjustments**
- 3.3 - **Reviewing Cost Estimating Systems**
- 3.4 - **Recognizing Potential Indicators Of Fraud And Other Wrongdoing**

**3.0 Chapter Introduction**

**3.1 Reviewing Accounting Systems**

**Accounting System Importance.** The accounting system is the source of most of the cost or pricing data and cost information other than cost or pricing data a firm provides to the Government. For that reason, you should be concerned about the firm's accounting system whenever you make any decisions involving the use of these data, such as:

- Contract pricing;
- Contractor responsibility, particularly for other than firm fixed-price contracts; or
- Initiation of progress payments.

**Accounting System Review (FAR 31.201-6 and DCAM 5-202).** The objective of the accounting system review is to determine the adequacy and suitability of a firm's accounting system and practices for accumulating costs under a prospective or existing Government contract. There are three sources of accounting principles and standards which are applicable to contractor accounting systems. In order of precedence, these are:

Cost Accounting Standards (CAS) promulgated by the Cost Accounting Standards Board. Whenever a
contractor is required to comply with CAS, the requirements of those Standards take precedence over all other accounting guidance. Federal Acquisition Regulation (FAR). All contractors must comply with applicable FAR requirements. For example, FAR establishes basic guidelines regarding contractor accounting for unallowable costs. Generally Accepted Accounting Principles (GAAP). Accounting treatment not specifically covered by CAS or FAR requirements must be treated in accordance with GAAP and the associated Financial Accounting Standards (FAS). When contractor accounting practices are inconsistent with the applicable requirements, costs resulting from such inconsistent practices must not be allowed in excess of the amount that would have resulted using consistent practices.

Situations Requiring an Accounting System Review. You should contact the cognizant auditor any time that you suspect that the Government's interests may be at risk because of the contractor's accounting practices. In particular, you should normally obtain an accounting system review as part of the following:

- Field pricing support;
- Preaward survey; or
- Review prior to initiation of progress payments.

Requesting Field Pricing Support (FAR 15.404-2). The contracting officer should request field pricing assistance when the information available at the buying activity is inadequate to determine a fair and reasonable price. When information is already available from an existing audit completed within the previous 12 months, never request a separate preaward audit of indirect costs unless the contracting officer considers the information inadequate for determining the reasonableness of the proposed indirect costs.

If you need a consolidated ACO/audit proposal analysis, request audit support through the ACO so the ACO can organize a coordinated review. If you only need an audit analysis, you may request the audit directly from the cognizant audit office using appropriate agency channels. Agency procedures may provide additional guidance on when to request audit support. For example, DFARS directs DoD contracting officers to request field pricing support for:

- Fixed-price proposals exceeding the cost or pricing data threshold;
- Cost-reimbursement proposals exceeding the cost or pricing data threshold from offerors with significant estimating system deficiencies; or
- Cost-reimbursement proposals exceeding $10 million from offerors without significant estimating system deficiencies.

Field Pricing Support Information (DCAM 10-306 and 10-308). Auditors providing field pricing support should notify you if they believe that the offeror's accounting system is inadequate to support the proposal or to permit satisfactory administration of the contract contemplated. Audit manuals provide specific notification procedures. For example, the Defense Contract Audit Agency (DCAA) Contract Audit Manual (DCAM) encourages auditors to highlight accounting system deficiencies in three ways. The Scope of the Audit section of the audit report should identify the audit impact of any outstanding deficiencies.

The Contractor's Organization and Systems section of the audit report should describe the contractor's accounting system including:

- A brief description of the accounting system or reference to a prior audit report that provides a description. If the auditor references another report and that report has not been previously distributed to you, the auditor is encouraged to attach a copy of that report to the current report for your information.
- An opinion on the overall system (adequate, inadequate, or inadequate in part).
- An opinion on the control risk (low, moderate, or high) and the impact of the risk on the area being audited.
- A list of outstanding internal control deficiencies including a brief description of each deficiency and the status of contractor corrective actions.
- Notes on any questioned costs should explain if the questioned cost is related to an accounting system
deficiency. 
Requesting Preaward Survey Information (FAR 9.106). Normally, you should request a preaward survey when the information on hand or readily available is not sufficient to make a determination on contractor responsibility. However, unless you can justify the cost, you should not request a preaward survey for any:

- Commercial item acquisition or
- Fixed-price contract action at or below the simplified acquisition threshold.

As part of the preaward survey request, you may request an accounting system review. Simply indicate the need for a review on the Standard Form (SF) 1403 (PDF file), Preaward Survey of Prospective Contractor.

Preaward Survey Information (FAR 9.106-4 and 53.301-1408). The person responding to the request, normally the cognizant auditor, will complete a Standard Form (SF) 1408 (PDF file), Preaward Survey of Prospective Contractor Accounting System. That person will make a general recommendation on the adequacy of the contractor's accounting system. As a minimum, the reviewer should also answer the following questions in making the recommendation:

Is the accounting system in accord with generally accepted accounting principles that are applicable to the contractor?

Does the accounting system provide for:

- Proper segregation of direct costs and indirect costs?
- Identification and accumulation of direct costs by contract?
- A logical and consistent method for the allocation of indirect costs to intermediate and final cost objectives?
- Accumulation of costs under general ledger control?
- A time keeping system that identifies employee's labor by intermediate and final cost objectives?
- A labor distribution system that charges direct and indirect labor to the appropriate cost objectives?
- Interim (at least monthly) determination of costs charged to a contract through routine posting of books of account?
- Exclusion from costs charged to Government contracts of amounts which are not allowable under FAR Part 31 and other contract clauses?
- Identification of costs by contract line item and by units if required by the contract?
- Segregation of preproduction costs from production costs?

Does the accounting system provide financial information:

- Required by contract clauses concerning limitation of cost and limitation of payments?
- Required to support progress payments?
- Is the accounting system designed and are the records maintained in such an manner that adequate, reliable data are developed for use in pricing follow-on acquisitions?
- Is the accounting system currently in full operation?

Requesting a Review Prior to Initiation of Progress Payments (FAR 32.503-3 and FAR 32.503-4). An adequate accounting system is essential for effective administration of progress payments. Progress payments in the amounts requested should be approved as a matter of course when the ACO has found from previous experience or recent (within the last 12 months) audit review that a contractor is:

- Reliable, competent, and capable of satisfactory performance,
- Possessed of an adequate accounting system and controls, and
- In sound financial condition.
For all other contractors, the ACO must not approve progress payments before determining that the:

- Contractor will be capable of liquidating any progress payments, or the Government is otherwise protected against loss by additional protective clauses, and
- Contractor’s accounting system and controls are adequate for proper administration of progress payments.

The ACO should use the services of the cognizant Government auditor to the greatest extent practicable in making these determinations. However a complete audit may not be necessary. *Information from A Review Prior to Initiation of Progress Payments (DCAM 14-202.1f).*

Audit report comments on the accounting system will generally be brief unless controls are found to be unacceptable. A standard comment might read: “The audit disclosed no weaknesses in the contractor’s internal control procedures that would necessitate a restriction of contract financing through progress payments.” If controls are found to be unacceptable, the report should detail specific weaknesses. *Preparing an Initial Position on Adequacy (FAR 30.202-7).* A contractor has only one cost accounting system. There should never be a situation where one contracting officer determines that the system is adequate while another contracting officer determines that the system is not adequate. When one is assigned, the ACO should play the key role in determining accounting system acceptability. Under CAS, the ACO is responsible for determining the adequacy of the contractor’s Disclosure Statement and for any action needed to require contractor correction of noncompliant accounting practices.

Before taking any action related to the adequacy of the contractor's accounting system, review the available information and ask any questions necessary to assure that you understand the position taken by the auditor, the ACO (if one is assigned), and any other experts involved in reviewing the accounting system. Consider the following:

- Facts found during the accounting system review.
- Missing or insufficiently documented findings.
- Apparent fallacies (quantitative or logical).
- Inconsistencies between the findings and other available information.

Based on the available information, establish an initial judgment on the adequacy of the system as the basis for discussions with the contractor. That position will depend on the reason for the review. If the system review was part of a proposal analysis, your position may be that the proposal is not adequate for negotiation. If the review was part of a preaward survey, your position may be that the contractor is not responsible or that the accounting system is not acceptable for the proposed contract type (e.g., cost-reimbursement). If the review involved progress payments, your position may be that the system is not adequate to support progress payments. As most audit reports will caution you, audit results should not be used for purposes other than the purpose for which the audit was accomplished without consulting the auditor. *Discussing the Accounting System Review (FAR 15.303(c), FAR 15.404-2(a)(5), and FAR 15.404-2(c)(1)).*

In general, the results should not be discussed with anyone not directly involved in the contracting process. The contracting officer is responsible for determining who should have information from the accounting system review (ASR) and how much data should be provided. If the ASR uncovers weaknesses or deficiencies, consider discussing them with the contractor prior to making a decision on adequacy.

In conducting discussions with the contractor, consider the following guidelines:

- The contracting officer should control all discussions.
- Other personnel such as the cognizant auditor should be invited to support the contracting officer as required, including participation in discussions.
- During discussions, the contractor should be advised of specific accounting system weaknesses or deficiencies.
- The contractor should be given an opportunity to provide additional information and take other
action necessary to correct any possible misunderstandings.

If further contractor action is required to resolve weaknesses or deficiencies, specific areas of action should be identified and a corrective action plan established. Any plan proposed by the contractor should include target completion dates for identified action. Request comments from the cognizant auditor on any proposed corrective action plan.

Findings on System Adequacy (FAR 15.404-2(c)(4) and FAR 15.404-2(d)). You may find an accounting system to be:

- Adequate.
- Adequate with exceptions covered by a corrective action plan.
- Inadequate.

In making the decision on system adequacy, you should place heavy reliance on the recommendation of the cognizant auditor and the ACO if one is assigned. Remember, auditors are the accounting experts who have general access to the contractor's accounting records, and the ACO is responsible for overall contract administration. To facilitate up to date audit support assure that the cognizant auditor receives a copy of any additional information presented by the contractor that may significantly affect audit findings. You may request the auditor to immediately review the disclosed information and report orally on the findings, followed by a supplemental report when necessary.

If you take any position on system adequacy other than the position recommended by the auditor, clearly document the rationale that led you to that position.

Protecting the Government's Interests (FAR 9.104-1(e), FAR 15.403-1, FAR 15.404-1(b), and FAR 32.503-3(b)).

If you find that the contractor’s accounting system is not adequate, you must take appropriate action to protect the Government’s interests. The action that you take should depend on the situation. If you requested the review as part of Government field pricing support, you may have rely exclusively on available price information to determine price reasonableness. If you requested a preaward survey to determine if the firm’s accounting system is adequate to support award and administration of a cost-reimbursement contract, you may decide to:

- Eliminate the firm from consideration as nonresponsible or
- Consider withholding award until the contractor agrees to remedy any identified deficiencies.

If you requested a review prior to initiating progress payments based on cost, you may refuse to make progress payments based on cost until the accounting system is made acceptable. If the Government is already making progress payments based on cost, you should reduce or suspend progress payments until the accounting system is made acceptable. As an alternative to progress payments based on cost, you may consider performance-based payments.

Before rejecting a small business offer that you consider to be nonresponsible, refer the matter to the Small Business Administration, which will decide whether or not to issue a Certificate of Competency.

3.2 Establishing The Government’s Position On CAS Cost Impact Adjustments

CAS Coverage (FAR Appendix B, 9904). When a contract is CAS-covered, the Standards take precedence over all other forms of accounting guidance. The table below, divides the 19 current Standards into four groups to highlight the types of coverage involved.

<table>
<thead>
<tr>
<th>COST ACCOUNTING STANDARDS</th>
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</thead>
<tbody>
<tr>
<td>Concepts and Principles</td>
</tr>
<tr>
<td>CAS 401</td>
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<tr>
<td>CAS 402</td>
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<tr>
<td>CAS 405</td>
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<tr>
<td>CAS Code</td>
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<tr>
<td>CAS 406</td>
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<td>CAS 403</td>
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<tr>
<td>CAS 407</td>
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<tr>
<td>CAS 410</td>
</tr>
<tr>
<td>CAS 418</td>
</tr>
</tbody>
</table>

Identification & Assignment of Costs

<table>
<thead>
<tr>
<th>CAS Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS 404</td>
<td>Capitalization of Tangible Assets</td>
</tr>
<tr>
<td>CAS 409</td>
<td>Depreciation of Tangible Capital Assets</td>
</tr>
<tr>
<td>CAS 408</td>
<td>Accounting for Compensated Personal Absence</td>
</tr>
<tr>
<td>CAS 412</td>
<td>Composition &amp; Measurement of Pension Costs</td>
</tr>
<tr>
<td>CAS 413</td>
<td>Adjustment &amp; Allocation of Pension Costs</td>
</tr>
<tr>
<td>CAS 415</td>
<td>Accounting for Deferred Compensation</td>
</tr>
<tr>
<td>CAS 416</td>
<td>Accounting for Insurance Costs</td>
</tr>
<tr>
<td>CAS 411</td>
<td>Accounting for Acquisition Costs of Materials</td>
</tr>
<tr>
<td>CAS 420</td>
<td>Accounting for IR&amp;D/B&amp;P</td>
</tr>
</tbody>
</table>

Cost of Money

<table>
<thead>
<tr>
<th>CAS Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS 414</td>
<td>Cost of Money as an Element of the Cost of Facilities Capital</td>
</tr>
<tr>
<td>CAS 417</td>
<td>Cost of Money as an Element of the Cost of Capital Assets under Construction</td>
</tr>
</tbody>
</table>

**CAS Exemptions** (FAR 30.201-4(a) and Appendix B, 9903.201-1(b)). CAS applies only to negotiated contracts and subcontracts. Therefore, contracts awarded using sealed bidding are exempt from CAS coverage. When awarding a contract using negotiation procedures, insert CAS clauses unless the contract or offeror is specifically exempt from CAS requirements. A contract or subcontract that is not CAS-covered at the time of award cannot become CAS-covered as the result of a contract or subcontract modification.

Criteria for Exempting Negotiated Contracts or Subcontracts From CAS Coverage

<table>
<thead>
<tr>
<th>Basis For Exemption</th>
<th>Exempt If Any Of The Following Situations Exist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of CAS Coverage (FAR Appendix B, 9903.201-2)</td>
<td>The two types of CAS coverage for commercial contracts are outlined in the table below. Note that offerors with a smaller dollar value of CAS-covered contracts may elect application of the less stringent modified coverage. However, if an offeror that qualifies for modified coverage does not specifically elect modified coverage, the firm will be subject to full CAS coverage.</td>
</tr>
</tbody>
</table>

<p>| Dollar Amount of Contract Award | The contract or subcontract price is less than or equal to $500,000 at the time of award. (When determining CAS exemptions, treat an order issued by one segment of a corporation to another as a subcontract.) |
| Contracts or subcontracts of less than $7.5 million, provided that, at the time of award, the business unit of the contractor or subcontractor is not currently performing any CAS-covered contracts or subcontracts valued at $7.5 million or greater. |
| Small Business | The contract or subcontract is with a small business. |
| Commercial Item(s) | The contract or subcontract is firm fixed-price or fixed-price economic price adjustment (provided that price adjustment is not based on actual costs incurred) for a commercial item(s). |
| Method of Pricing | The contract or subcontract price is set by law or regulation. |
| The contract or subcontract is firm fixed-price and awarded on the basis of adequate price competition without contractor submission of any cost data. |
| Foreign Contractor/Performance | The contract or subcontract is with a United Kingdom contractor for performance substantially in the United Kingdom (provided that the contractor has filed with the United Kingdom Ministry of Defense, for retention by the ministry, a completed disclosure statement which adequately describes its cost accounting practices). Whenever the contractor or subcontractor is already required to follow U.K. Government Accounting Conventions, the disclosed practices must be in accord with those Conventions. |
| The contract or subcontract is with a foreign government, agent, or instrumentality, or is awarded to a foreign concern. These contracts and subcontracts are subject to CAS 401 and 402. |
| The contract or subcontract is executed and performed entirely outside the United States, its territories, and possessions. |
| The subcontract is awarded under the NATO PHM Ship program and is performed outside the United States by a foreign concern. |</p>
<table>
<thead>
<tr>
<th>Coverage Type</th>
<th>Application</th>
<th>Coverage requires that the business unit...</th>
</tr>
</thead>
</table>
| Full         | Applies to contractor business units that...  
          | Receive a single CAS-covered contract award of $50 million or more; or  
          | Received $50 million or more in net CAS-covered awards during its preceding cost accounting period. | Comply with all Standards that are in effect on the date of contract award and with any Standards that become applicable because of later award of a CAS-covered contract.  
          | In addition, the business unit must submit and maintain a Disclosure Statement of its accounting practices. |
| Modified     | If the offeror certifies that it is eligible for and elects to use modified coverage, it may be applied to a CAS-covered contract of:  
          | Less than $50 million awarded to a business unit that received less than $50 million in net CAS-covered awards in the immediately preceding cost accounting period. | Comply with CAS 401, 402, 405, and 406.  
          | Note: A contract awarded with modified CAS coverage shall remain subject to modified coverage throughout its life regardless of changes in the business unit’s CAS status during subsequent cost accounting periods. |

Educational Institutions: 48 CFR 9905 contains the following four standards that apply to educational institutions receiving a negotiated federal contract or subcontract award in excess of $500,000: CAS 501, 502, 505, and 506 (standards with essentially the same requirements as CAS 401, 402, 405, and 406). A business unit segment is required to submit a Disclosure statement upon receipt of a $25 million CAS-covered contract award or if it received $25 million or more in net CAS-covered awards during its preceding cost accounting period, of which, at least one award exceeded $1 million.  

Disclosure Statement ([FAR Appendix B, 9903.202-1](https://www.acq.osd.mil/far/farapp/appendixb_9903.html) and [Appendix B, 9903.202-9](https://www.acq.osd.mil/far/farapp/appendixb_9903.html)). A Disclosure Statement is a written description of a contractor's cost accounting practices and procedures. The Statement is required to be submitted using a Disclosure Statement Form (CASB DS-1, or CASB DS-2 for educational institutions), and requires the contractor to provide general information on its operations and specific information on how the firm accounts for specific types of costs.  

Requirement for Submission of a Disclosure Statement ([FAR Appendix B, 9903.202-1](https://www.acq.osd.mil/far/farapp/appendixb_9903.html)). A Disclosure Statement is required for each business unit selected to receive a CAS-covered contract or subcontracts of $50 million or more, or when the company, together with its segments, received net awards of CAS-covered contracts and subcontracts totaling $50 million or more in its most recent cost accounting period. When a Disclosure Statement is required, a separate Disclosure Statement must be submitted for each segment with costs exceeding $500,000 in the total price of any CAS-covered contract or subcontract, unless:  

- The contract or subcontract is of the type or value exempted from CAS requirements, or  
- CAS-covered awards in the most recently completed cost accounting period are less than 30
percent of total segment sales for the period and less than $10 million.

Each corporate or other home office that allocates costs to one or more disclosing segments performing CAS-covered contracts must submit a completed Part VIII of the Disclosure Statement. Foreign contractors and subcontractors who are required to submit a Disclosure Statement may, in lieu of filing a CASB-DS-1, make disclosure by using a disclosure form prescribed by an agency of its Government, provided that the Cost Accounting Standards Board determines that the information disclosed by that means will satisfy the objectives of Public Law 100-679. Currently, the use of alternative forms has been approved for the contractors of Canada and the Federal Republic of Germany.

*Disclosure Statement Adequacy Review (FAR 30.202-7(a)).* The cognizant auditor must review the Disclosure Statement to ascertain whether it is current, accurate, and complete and report the results of that review to the CFAO. Based on the audit findings, the CFAO must determine if it adequately discloses the firm's accounting practices.

If the CFAO determines that the Disclosure Statement is:

- Adequate, the CFAO must notify the contractor in writing with copies to the cognizant auditor and affected contracting officers. The notice must state that a disclosed practice shall not, by virtue of its disclosure, be considered an approved practice for pricing proposals or accumulating and reporting contract performance cost data.

- Not adequate, the CFAO must notify the contractor of the inadequacies and request a revised disclosure statement.

*Disclosure Statement Adequacy and Contract Award (FAR 30.202-6(b)).* Normally, the contracting officer must not award a CAS-covered contract until the CFAO has made a written determination that a required Disclosure Statement is adequate. However, in order to protect the Government's interest, the contracting officer may waive the requirement for an adequacy determination before contract award. If such a waiver is granted, the contracting officer must require a determination of adequacy as soon as possible after contract award.

*Disclosure Statement Changes and Equitable Adjustments.* A contractors may initiate changes in its disclosed accounting practices for a variety of reasons during contract performance. The table below identifies the types of accounting changes and the cost adjustment required for each type of change. FAR 30.604 provides the requirements for processing changes in cost accounting practices and determining the impact of changed practices on costs to the Government.

<table>
<thead>
<tr>
<th>Requirements for Adjustment Under CAS Coverage</th>
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<tbody>
<tr>
<td><strong>Type of Accounting Change</strong></td>
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<tr>
<td><strong>Required change</strong></td>
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<tr>
<td>FAR 30.603-1</td>
</tr>
<tr>
<td><strong>Desirable Change</strong></td>
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<tr>
<td>FAR 30.603-2(b)</td>
</tr>
<tr>
<td><strong>Unilateral-Change</strong></td>
</tr>
<tr>
<td>FAR 30.603-2(a)</td>
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</tbody>
</table>
change is desirable to the Government. the aggregate as a result of the change.

NOTE: A change in cost accounting practices to correct a CAS noncompliance is not treated as a change in cost accounting practices or purposes of cost adjustment.

Required Accounting System Change (FAR 30.603-1, FAR 52.230-1, FAR 52.230-2 and FAR 52.230-7). The solicitation Cost Accounting Standards Notices and Certification provision, requires offerors to state whether or not the award of a proposed contract would require a change to established cost accounting practices that would affect existing contracts and subcontracts. A new or modified Standard becomes applicable prospectively to existing CAS-covered contracts when a new contract containing the Cost Accounting Standards clause is awarded on or after the effective date of the new or modified Standard. If the new contract award does require an accounting system change to comply with a new or modified Standard, that change may affect the costs charged to existing contracts. Those existing contracts and subcontracts containing the Cost Accounting Standards clause may require equitable adjustments. Adjustments are limited to open contracts and subcontracts awarded before the effective date of the new or modified Standard. The general process for negotiating the cost impact of an accounting system change required to comply with a new or modified Standard is presented in the following table.

<table>
<thead>
<tr>
<th>Negotiating the Cost Impact of a Required Change</th>
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<tbody>
<tr>
<td>Step</td>
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<td>1</td>
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<td>3</td>
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<td>4</td>
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<td>5</td>
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</table>
the cost impact in accordance with FAR 30.606.

Desirable and Unilateral Cost Accounting Practice Changes (FAR 30.603-2(b), FAR 52.230-6, and DCAM 8-502.2). The Administration of Cost Accounting Standards clause of CAS-covered contracts requires the contractor to notify the ACO and submit a description of any voluntary cost accounting practice change not less than 60 days (or such date as mutually agreed to) before implementation of the voluntary change.

Negotiating the Cost Impact of a Desirable or Unilateral Change

<table>
<thead>
<tr>
<th>Step</th>
<th>CFAO Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If you become aware of a proposed cost accounting practice change, you may remind the contractor that the contract requires the contractor to submit the description of the change in cost accounting practices not less than 60 days (or other mutually agreed to date) before implementation along with any request that the change be considered desirable.</td>
</tr>
<tr>
<td>2</td>
<td>With assistance of the cognizant auditor, review the proposed change for adequacy and compliance. If the description of the change meets both tests, notify the contractor and request submission of a cost impact proposal. If the description of the change is adequate, request the contractor submit a cost impact proposal. &lt;ul&gt;&lt;li&gt;For each cost accounting practice change, FAR 30.604 provides the requirements for processing changes and determining the cost impact to the Government of the change.&lt;/li&gt;&lt;/ul&gt;</td>
</tr>
<tr>
<td>3</td>
<td>Analyze the cost impact proposal and if requested by the contractor, determine whether the change is a desirable change. Develop a negotiation position on the net cost impact of the change on all CAS-covered contracts and subcontracts. If the change is desirable and not detrimental, you may negotiate an equitable adjustment. If the change is unilateral (not considered desirable), you must ensure that the Government does not pay increased costs in the aggregate.</td>
</tr>
<tr>
<td>4</td>
<td>Negotiate the cost impact or make a unilateral adjustment(s) if unable to reach a negotiated settlement. After negotiation, prepare a negotiation memorandum and contract price adjustments, or take alternative actions to resolve the cost impact in accordance with FAR 30.606.</td>
</tr>
</tbody>
</table>

Adjustment for Noncompliance (FAR 30.202-7(b) and FAR 30.605). After the CFAO's notification of Disclosure Statement adequacy, the cognizant auditor must conduct a detailed compliance review to ascertain whether or not the disclosed practices comply with FAR Part 31 and CAS. Contractor's failure to comply with CAS may be identified then or at any time during the performance of a CAS-covered contract or subcontract. The cognizant auditor must report any alleged noncompliance to the CFAO for appropriate action.

Under the contract Cost Accounting Standards clause, the contractor must agree to an adjustment in contract price or a cost allowance, if the contractor fails to comply with an applicable Standard or to follow any cost accounting practice consistently and such failure results in increased cost to the Government. Adjustments must provide for recovery of increased costs and related interest computed at the annual rate established under Section 6621 of the Internal Revenue Code of 1986.

The following table outlines the general steps involved in negotiating the cost impact of CAS noncompliance.

Negotiating the Cost Impact of CAS Noncompliance (FAR 30.605)
<table>
<thead>
<tr>
<th>Step</th>
<th>CFAO Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Within 15 days of receipt of a report of alleged noncompliance from the auditor, make an initial finding of compliance or noncompliance and notify the auditor.</td>
</tr>
<tr>
<td>2</td>
<td>If there is an initial finding of noncompliance, immediately notify the contractor in writing of the exact nature of the noncompliance and allow the contractor 60 days within which to agree or to submit reasons why the contractor believes its existing practices are compliant.</td>
</tr>
<tr>
<td>3</td>
<td>If the contractor disagrees with the initial finding of noncompliance, review the reasons why the contractor considers the current practices to be in compliance and make a determination of compliance or noncompliance, including a written explanation on the rationale used in making the decision. Notify the contractor and the auditor in writing of the determination.</td>
</tr>
<tr>
<td>4</td>
<td>If there is a determination of noncompliance, inform the contractor that the noncompliance should be corrected and of the Government's remedies if it is not corrected. When a cost accounting practice change is required to correct a noncompliance, request that a revised Disclosure statement be submitted to correct the noncompliant practice. Review the revised disclosures for adequacy and compliance. If the description of the change meets both tests, notify the contractor and request submission of a cost impact proposal.</td>
</tr>
<tr>
<td></td>
<td>• For each noncompliance, the cost impact to the Government will depend on the type of noncompliance (estimating or cost accumulation).</td>
</tr>
<tr>
<td></td>
<td>• FAR 30.605 provides the requirements for processing noncompliances and determining the impact of noncompliant practices on costs to the Government.</td>
</tr>
<tr>
<td>5</td>
<td>Negotiate appropriate adjustments to preclude the payment of increased costs in the aggregate. If an agreement cannot be negotiated, you may make a unilateral adjustment, subject to contractor appeal as provided for in the contract Disputes clause.</td>
</tr>
<tr>
<td>6</td>
<td>After negotiation, prepare a negotiation memorandum and contract price adjustments, or take alternative actions to recover the cost impact in accordance with FAR 30.606.</td>
</tr>
</tbody>
</table>

**Alternatives for Resolving Cost Impacts** *(DCAM 8-503 and FAR 30.606)*. When resolving cost impacts resulting from cost accounting practice changes or noncompliances, the CFAO may:
- Adjust all of the CAS-covered contracts and subcontracts, or some of the contracts and subcontracts with a material cost impact
- Adjust contract prices, cost ceilings or target costs; or
- Use alternative methods to recover the cost impact, such as adjustment of final indirect cost rates or cash payment.

The CFAO shall not combine the cost impact of any of the following:
- A required change and a unilateral change.
- A required change and a noncompliance.
- A desirable change and a unilateral change.
- A desirable change and a noncompliance.

The CFAO shall not combine the following cost impacts *unless* all of the cost impacts are increased costs.
to the Government:

- One or more unilateral changes.
- One or more noncompliances.
- Unilateral changes and noncompliances.

The CFAO may consider the cost impacts of a unilateral change affecting two or more segments to be a single change if the changes affect the flow of costs between segments or it implements a common cost accounting practice for two or more segments.

**Remedies for Contractor Failure to Make Submissions (FAR 30.604(i)).**

If the contractor fails to submit the required cost impact proposal, the CFAO, with assistance from the cognizant auditor, must take appropriate action as outlined in the following table:

<table>
<thead>
<tr>
<th>Step</th>
<th>CFAO Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Estimate (with assistance from the cognizant auditor) the general dollar magnitude of the change or proposed change on all CAS-covered contracts and subcontracts affected.</td>
</tr>
</tbody>
</table>
| 2    | If the estimate indicates that there is a net amount due the Government, you may take one or both of the following actions:  
  - Withhold up to 10 percent of each payment due the contractor on CAS-covered contracts (up to the estimated GDM of the cost impact) until the contractor furnished the information.  
  - Issue a final decision and unilaterally adjust the contract(s) by the estimated amount of the cost impact. |

### 3.3 Reviewing Cost Estimating Systems


Verifiable, supportable, and well-documented cost estimates benefit both the Government and the contractor. The key to consistent preparation of quality estimates is an adequate estimating system. An estimating system encompasses the contractor's policies, procedures, and practices for generating cost estimates and other data included in proposals submitted to customers in the expectation of receiving contract awards. Components include the contractor's:

- Organizational structure;
- Established lines of authority, duties, and responsibilities;
- Internal controls and managerial reviews;
- Flow of work, coordination, and communication; and
- Estimating methods, techniques, accumulation of historical costs, and other analyses used to generate cost estimates.

**Conditions That May Indicate Estimating Deficiencies (DFARS 215.407-5-70(d)(3)).** Significant estimating deficiencies are often the result of poorly constructed estimating systems. A good system integrates all aspects of the contractor's operation into an effective and trackable information flow. Some of the areas that may be included are: cost accounting, production management, budgeting, subcontracting/purchasing, inventory control, and strategic business planning.

The following have been identified by the DoD as conditions that may indicate potentially significant
estimating deficiencies and excessive costs to the Government:

- Failure to ensure that historical data on the same or similar work are available to and utilized by cost estimators where appropriate.
- Continuing failure to analyze material costs or failure to perform subcontractor cost reviews as required.
- Consistent absence of analytical support for significant proposed costs.
- Excessive reliance on individual personal judgment where historical experience or commonly used standards are available.
- Recurring significant defective pricing findings within the same cost element(s).
- Failure to integrate relevant parts of other management systems (e.g., production or cost accounting) with the estimating system so that the ability to generate reliable cost estimates is impaired.
- Failure to provide established policies, procedures, and practices to persons responsible for preparing and supporting estimates.

Other indicators of problems include:

- Management information that does not match the data in proposals.
- Standards for labor and material costs that are not current.
- Changes in make-or-buy decisions not disclosed.
- Inappropriate or misleading sampling techniques.

**Review Situations (FAR 15.407-5).** The concepts of Total Quality Management (TQM) teach that good systems are more likely to produce good products. Based on this philosophy, the Government uses three types of reviews to assure that the estimating systems used to produce contract cost proposals are adequate.

**Ongoing Audit Review Programs.** Cognizant auditors may establish and manage regular programs for reviewing selected contractor's estimating systems or methods in order to:

- Reduce the scope of reviews to be performed on individual proposals;
- Expedite the negotiations process; and
- Increase the reliability of proposals.

The auditor sends a copy of the estimating system survey report and a copy of the official notice of corrective action required to each contracting office and contract administration office having substantial business with that contractor. Significant deficiencies not corrected by the contractor must be considered in subsequent proposal analyses and negotiations.

**Contractually Mandated Estimating System Review (FAR 15.404-2(d), DFARS 215.407-5-70, and DFARS 252.215-7002).**

An agency may authorize or require contracting officers to establish and monitor a contractually mandated program of periodic estimating system reviews. For example, ACOs assigned to the DoD must establish a contractually mandated review program for any contractor that meets the following requirements:

During its preceding fiscal year, the contractor received DoD prime contracts or subcontracts totaling $50 million or more for which certified cost or pricing data were required.

During its preceding fiscal year, the contractor received DoD prime contracts or subcontracts totaling $10 million or more, but less than $50 million, for which certified cost or pricing data were required, and the contracting officer with the concurrence of the ACO determines that a review is in the best interest of the Government.

**Field Pricing Support.** Auditors requested to provide field pricing support may identify estimating system deficiencies while performing any required audit. They should notify you if they believe that the offeror’s estimating methods are inadequate to support the proposal or permit satisfactory administration of the contract contemplated.
Conducting a Review. When evaluating the acceptability of contractor's estimating system, the cognizant auditor should consider any factors that affect estimate development such as the following:

- The source of data for estimates and the procedures for ensuring the data are accurate, complete, and current;
- The documentation developed and maintained in support of the estimate;
- The assignment of responsibilities for originating, reviewing, and approving estimates;
- The procedures followed for developing estimates for direct and indirect cost elements;
- The extent of coordination and communication between organizational elements responsible for the estimate; and
- Management support, including estimate approval, establishment of controls, and training programs.

Resolving Deficiencies (FAR 15.407-5). Whenever an estimating system review is conducted, the auditor will document the findings and recommendations and provide them to the contracting officer (the ACO when one is assigned). Significant deficiencies not corrected by the contractor must be considered in subsequent proposal analysis and negotiations.

The contractually-mandated DoD estimating system review program described above includes detailed guidelines for resolving deficiencies in the adequacy of contractor disclosure or estimating system characteristics.

<table>
<thead>
<tr>
<th>Step</th>
<th>ACO Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The contract Cost Estimating System Requirements clause requires the contractor to establish and maintain an adequate estimating system and disclose that system to the ACO in writing.</td>
</tr>
<tr>
<td>2</td>
<td>The cognizant auditor will head a team review of the contractor's estimating system disclosure and report findings on the adequacy of the disclosure and the system.</td>
</tr>
<tr>
<td>3</td>
<td>Provide a copy of the team report to the contractor and ask the contractor to submit a written response to any identified deficiencies within 30 days, or a reasonable extension thereof. If the contractor agrees with the report, the contractor has 60 days from the date of initial notification to correct deficiencies or submit a corrective action plan showing milestones and actions to eliminate the deficiencies. If the contractor disagrees, the contractor should provide rationale in its written response.</td>
</tr>
<tr>
<td>4</td>
<td>In consultation with the cognizant auditor, evaluate the contractor's response to determine whether: The existing system contains deficiencies which need correction. The deficiencies are significant deficiencies that should result in disapproval of all or a portion of the contractor's estimating system. The contractor's proposed corrective actions are adequate to eliminate the deficiency.</td>
</tr>
</tbody>
</table>
5. Notify the contractor and the auditor of the Step 4 determination and, if appropriate, of the Government's intent to disapprove all or selected portions of the system. The notice must:
- List the cost elements covered.
- Identify any deficiencies requiring correction.
- Require the contractor to correct the deficiencies within 45 days or submit an action plan showing milestones and actions to eliminate the deficiencies.

6. If the contractor has neither submitted an acceptable corrective action plan nor corrected significant deficiencies within 45 days, disapprove all or selected portions of the contractor's estimating system. The disapproval must:
- Identify the estimating system elements covered.
- List the deficiencies which prompted the disapproval.
- Be sent to the cognizant auditor, and each contracting and contract administration office having substantial business with the contractor.

7. With the auditor, monitor the contractor's progress in correcting deficiencies. If the contractor fails to make adequate progress, take whatever action is necessary to ensure that the contractor corrects the deficiencies. Examples of the action that you can take include:
- Bringing the issue to the attention of higher-level management.
- Reducing or suspending progress payments.
- Recommending that potential contracts not be awarded to the contractor.

8. Withdraw the estimating system disapproval when you determine that the contractor has corrected the significant system deficiencies. Notify the contractor, the auditor, and affected contracting and contract administration activities of the withdrawal.

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**Protect the Government's Interests** *(FAR 15.407-5(b) and DFARS 215.407-5-70(g)(2))*. If you are responsible for negotiation of a proposal generated by an estimating system with an identified deficiency, you must determine whether the identified deficiency impacts your negotiations. If it does not, proceed with negotiations as usual. If it does, you must take appropriate action to protect the Government's interests. The table below identifies some of the actions that you should consider:

<table>
<thead>
<tr>
<th>Consider the contractor estimating systems with identified deficiencies --</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider the following alternatives...</td>
</tr>
<tr>
<td>Allow additional time for proposal preparation/revision.</td>
</tr>
<tr>
<td>Consider changing the contract type.</td>
</tr>
<tr>
<td>Task</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Reaccomplishing some elements of acquisition planning.</td>
</tr>
<tr>
<td>Perform additional cost analysis on suspected cost areas.</td>
</tr>
<tr>
<td>Segregate suspected cost elements in a cost-reimbursement line item.</td>
</tr>
<tr>
<td>Reduce the fee/profit objective.</td>
</tr>
<tr>
<td>Insert a reopener clause covering the suspected cost elements.</td>
</tr>
</tbody>
</table>

**Monitoring Corrective Action** (DFARS 215.407-5-70(f)(6)). The cognizant auditor and administrative contracting officer are responsible for monitoring contractor progress in correcting deficiencies administrative. Should the contractor fail to make adequate progress in correcting deficiencies, several options are available:

- Highlight the deficiencies in audit and pricing reports.
- Elevate the matter to higher level contract management
- Consider reducing or suspending progress payments until identified deficiencies are corrected.
- Recommend that contracting officers not award contracts until identified deficiencies are corrected.

**3.4 Recognizing Potential Indicators Of Fraud And Other Wrongdoing**

**Evidence of Fraud or Other Wrongdoing** (DCAM 4-702.1b). When reviewing a firm’s pricing and accounting practices, you may encounter information constituting evidence or causing suspicion of fraud or other wrongdoing. Sources of such information may include file documentation, statements from company employees or disgruntled participants in the wrongdoing, or other sources. Allegations may be made by letter, telephone, personal visit, or through a third party.

For the purpose of this section, the term "fraud and other wrongdoing" means any willful or conscious wrongdoing, including, but not limited to, acts of cheating or dishonesty which cause (or contribute to) a loss or injury to the Government. Examples include:

- Falsification of documents such as time cards or purchase orders;
- Charging personal expenses to Government contracts;
- Submitting false claims such as invoices for services not performed or materials not delivered;
- Intentional mischarging or misallocation of costs;
- Deceit by suppression of the truth;
- Bribery;
- Payments that violate the Foreign Corrupt Practices Act;
- Theft;
- A Government employee acquiring a financial interest in or seeking employment with a contractor over whom the employee exercises oversight;
- Kickbacks;
- Unlawful or fraudulent acts resulting from accounting classification practices designed to conceal the true nature of expenses (e.g., classifying unallowable advertising or entertainment costs as office supplies);
- Product substitution or false certification that tests were performed; or
- Any attempt or conspiracy to engage in, or use, any of the above devices.

- Potential Fraud Related to Defective Pricing.

Contracting personnel must be particularly alert to potential incidents of contractor fraud related to defective pricing incidents where the contractor **knowingly makes a false statement or a false claim** with the intent of defrauding the Government. The Department of Defense Inspector General (DODIG) has identified 29 indicators and scenarios of potential fraud related to defective pricing:

- Alteration (without notice to the Government) or falsification of supporting data;
- Failure to update cost or pricing data even though it is known that past activity showed that costs or prices have decreased;
- Failure to make complete disclosure of data known to responsible contractor personnel;
- Distortion of the overhead accounts or baseline information by transferring charges or accounts that have a material impact on Government contracts;
- Failure to correct in a timely manner, known estimating or pricing system deficiencies which directly and repeatedly result in defective pricing;
- Repeated denial by the responsible contractor employees of the existence of historical records that are subsequently found;
- Proposing one vendor, while intending, at the time of that proposal, to use another lower priced vendor;
- Intentional failure to update cost or pricing data when clearly required by law or regulation;
- Selectively disclosing work orders with higher costs while knowingly not including additional pertinent work orders with lower costs;
- Altering the dates on material or subcontract purchase orders from dates prior to the prime contract negotiations to dates after the negotiations;
- Repeated instances of lost or destroyed records (other than those destroyed pursuant to the contractor’s normal document destruction policy) which would provide supporting details for proposed costs that were based on experience;
- Fabrication of supporting information for a proposed cost factor when no historical information is actually collected or segregated for that type of expense;
- An undisclosed change in a make-versus-buy decision which is known by the contractor prior to the conclusion of final price negotiations;
- Not disclosing total company material requirements for items qualifying for quantity/sale discounts, thereby knowingly proposing a higher unit price than the combined purchase will actually generate;
- Claiming an exemption from the submittal of cost or pricing data based on catalog or market pricing when the company knows the end user of the item is always the Government;
- Proposing an increase in price due to a break in production when the contractor knows, based on the proposed delivery schedule, that no break will occur;
- Protracted delay in the release of data to the Government to which the Government is clearly entitled, under the law and regulations existing at the time of the initial request for the data, for the purpose of avoiding a reduction in negotiated price;
- Including rates in the proposal, such as insurance or workman's compensation, which are deliberately increased or inflated above the contractor's actual forecasted rates;
- Intentionally duplicating costs by proposing them as both direct and indirect;
- Consciously proposing items the contractor knows, or should know, are obsolete or unneeded to perform the contract;
- Not disclosing inventory that the contractor knew, should have known, or suspected was excess and available for use on later contracts;
- Deliberately not disclosing known or company-available actual costs that were reasonably available prior to the conclusion of price negotiations for a follow-on contract;
- Proposing a purchase at price (subcontract or interorganizational transfer) for a portion of the contract effort when the contractor knows, at the time of proposing, the effort will be performed via an interorganizational transfer at cost;
- Willful, knowing, or reckless disregard of the contractor's established estimating practices;
- Suppressing internal/external studies or reports that do not support the proposed costs;
- Commingling work orders with other work orders to hide productivity improvements or deliberately distorting the labor-hours incurred for a particular series of work orders;
- Requesting an economic price adjustment clause for material that has already been purchased;
- Submitting false documents; or
- Intentionally failing to disclose internal documents on vendor discounts that constitute cost or pricing data and were reasonably available prior to the conclusion of price negotiations.

**Persons and Situations Involved** (DCAM 4-702.1a). Allegations of fraud or other wrongdoing may involve the acts of:
- Government employees (military or civilian) in their relations with the Government.
- Government employees (military or civilian) in their relations with individuals or firms.
- Individuals or firms in their business relations with the Government.
- Individuals or firms in their business relations with other individuals or firms doing business with the Government.

**Responsibility to Report** (Executive Order 12674, as amended, DOD 5500.7-R, and FAR 1.602-2). Government officials receive guidance on ethical conduct from a combination of laws, executive orders, regulations, and directives. While specific procedure may vary from agency to agency, this guidance consistently emphasizes that employees must report any suspected waste, fraud, abuse, or corruption to appropriate authority. Contracting personnel have a special responsibility to safeguard the interests of the United States in its contractual relationships. That includes a responsibility to ensure that all ethics guidelines are strictly followed throughout the contracting process.

**Coordinated Team Effort** (FAR 3.700). The Government may pursue different remedies for fraud or other suspected types of wrongdoing. In many cases, the action will involve civil or criminal court action. Administrative actions may also be involved. For example, the Government has the right to void or
rescind a contract when the contractor is found guilty of bribery, conflict of interest, or similar misconduct related to the contract.

A coordinated Government Acquisition Team effort is essential to assure effective resolution given the merits of the case. The Government legal counsel should play a key role in determining the proper course of action. For cases related to pricing and accounting practices, the cognizant Government auditor should be a involved in establishing the merits of the case.

- 4.0 - Chapter Introduction
- 4.1 - Identifying And Analyzing Cost And Schedule Variances
- 4.2 - Estimating Cost To Complete
- 4.3 - Resolving Potential Cost Overruns
- App 4A - Earned Value Management System Guidelines

4.0 Chapter Introduction
This chapter will examine methods that can be used to identify, analyze, and resolve contract cost and schedule variances.

Contract Surveillance (FAR 42.1103, FAR 42.1104, and FAR 42.1105). While the contractor is responsible for timely cost-effective contract performance, the Government is responsible for maintaining contract surveillance to the extent necessary to protect the Government's interests. Appropriate procedures for identification and analysis of cost and schedule variances should be a part of every contract surveillance plan.

As a contracting officer preparing a new contract, consider the information required for effective surveillance of contract performance as you define contract-reporting requirements. If you are the contracting officer responsible for contract administration, determine the contract surveillance requirements based on the criticality of the contract requirement to the Government and the circumstances affecting contract performance.

- **Criticality to the Government.** The contracting officer must assign a criticality designator to each contract following the guidelines in the table below. In general, the more critical the requirement is to the Government, the more attention you should be given to contract surveillance, including cost and schedule variance identification and analysis.

<table>
<thead>
<tr>
<th>Criticality Designator</th>
<th>Relative Criticality</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Most critical.</td>
<td>Critical contracts (including DX-rated contracts), contracts involving unusual and compelling urgency, and contracts for major systems.</td>
</tr>
<tr>
<td>B</td>
<td>Moderately critical.</td>
<td>Contracts (other than those designated &quot;A&quot;) for items needed to maintain a Government or contractor production or repair line, to preclude out-of-stock conditions, or to meet user needs for non-stock items.</td>
</tr>
</tbody>
</table>
C | Least critical. | All other contracts.
---|---|---

- **Circumstances of the Contract.** In general, the level of complexity of the contract will drive the level of contract surveillance. When analyzing contract complexity, consider:
  - **Contract performance reporting.** Cost-reimbursement, time-and-materials, and labor-hour contracts typically have stringent requirements for reporting progress and performance than fixed-price contracts.
  - **Contract performance schedule.** Contracts with longer or complex schedule requirements normally merit increased surveillance, because there may not be immediate indicators identifying a potential or active problem. In addition a contract with an ambitious or aggressive completion schedule will normally merit greater surveillance to ensure schedule milestones are met.
  - **Contractor's history of contract performance.** A contractor with a history of overruns, late completion of performance, or late deliveries will normally merit closer surveillance to ensure performance outcomes.
  - **Contractor's experience supporting supplies or services contracts.** A contractor with limited experience will normally merit closer surveillance.
  - **Contractor's financial capability.** A contractor with marginal financial capability will normally merit closer surveillance.
  - Any supplementary written instructions from the contracting office.

4.1 Identifying And Analyzing Cost And Schedule Variances

*Uses for Information on Variances (FAR 52.232-7(c), FAR 52.232-20(a), FAR 52.232-22(a), FAR 52.243-1(b), FAR 52.243-2(b), FAR 52.243-3(b), and FAR 52.243-4(d)*)

Information on variances from cost and schedule projections can provide vital input to many contract administration decisions.

- Information on the contractor's progress toward timely contract completion is important for the administration of any contract. However, it is most important for cost-reimbursement, time-and-material, and labor-hour contracts. For these contracts, the contractor only agrees to put forth its best effort to complete the contract effort within funding, cost, or price limitations to the extent prescribed in the contract.
- Appropriate Government surveillance during performance will provide reasonable assurance that efficient methods and effective cost controls are used.
- Information on contractor cost and schedule performance is essential to negotiating an equitable adjustment that leaves the contractor in the same profit position as it was before the modification.
- Information on cost of the current contract can be a key element in projecting the cost of follow-on contracts awarded before the current contract is complete.

*Consider Both Cost and Schedule Variances.* To analyze variances, you need to be able to consider contractor cost and schedule variances from initial cost estimates. For example, a contractor in Month 4 of a 12-month contract is tracking perfectly with estimated costs through Month 4. However, the contractor is two months behind schedule. In other words, two months of actual performance have cost as much as four months were projected to cost. If we consider only cost, there does not appear to be a problem. However, if we consider both cost and schedule, there appears to be significant potential for a cost and/or schedule overrun.

*Information Sources.* You can use information from a variety of sources to monitor cost and schedule performance variance, such as:
  - Contractually required cost/schedule analysis and reporting, including:
    - Contract Performance Reports under Earned Value Management System (EVMS) Guidelines; and
Cost/Schedule Status Report. (This is no longer a valid data item, but may still be in use on older contracts.)

- Contractually required cost information, including:
  - Contract Funds Status Reports:
  - Progress payment requests;
  - Cost-reimbursement vouchers;
  - Contract progress reports; or
  - Limitation of cost/funds notices.

- Contractor production management reports and analyses, Including:
  - Integrated Master Schedule/Integrated Master Plan (IMP/IMS) required under EVMS criteria
  - Phase Planning or Gantt Charts
  - Production Flow Charts
  - Program Evaluation and Review Technique (PERT) network analyses

- Progress review meetings
- Observation by Government personnel

Points to Consider in Information Source Selection. The method that you select must be appropriate for the contract. When you have a complex or difficult contract for a requirement with a Criticality A Designator, you should consider contractually mandated analysis and reporting system (e.g., compliance with EVMS Guidelines for a major acquisition). The risk involved will likely merit the additional cost of the required system. In addition, you must also consider the cost of the contract when determining information sources. For example, EVMS is required on DoD cost or incentive contracts valued at $20,000,000 or more and is optional below $20,000,000 and is a risk based decision. It is unlikely that a requirement with a Criticality C Designator would merit the added cost of any contractually mandated cost/schedule reporting. For low-value low-risk items, you would probably rely on routine observation by Government personnel, unless the contract value meets EVMS applicability thresholds ($20,000,000 for DoD contracts).

To be effective, the method selected must provide or permit you to develop:
- A cost baseline upon which the original contract cost was derived (usually the contractor's time phased budget or proposal). This is called the planned value in EVM terminology.
- A schedule baseline with an integrated, network schedule supporting the planned value.
- Actual costs incurred for completed work.
- An estimate to complete.


Surveillance (routine evaluation and assessment) of the EVMS is mandatory for all contracts that require supplier EVMS compliance—which is basically all contracts with an EVM requirements to comply with the 32 ANSI/EIA-748 EVMS guidelines. Appendix 4A presents the 32 Industry Standard Guidelines for development and operation of Earned Value Management Systems (EVMSs). Under these guidelines, contract work is planned, budgeted, and scheduled in time-phased "planned value" increments to establish a cost and schedule measurement baseline. Actual cost and schedule performance is then compared to the established baseline.

**Compliance.** Surveillance ensures that the supplier is meeting contractual terms and conditions and is in compliance with applicable policies and regulations. If changes are made to those terms and conditions, then a modification to the contract is required. Surveillance becomes mandatory.
through the inclusion of the Defense Federal Acquisition Regulation Supplement (DFARS) clause 252.234-7002. Requiring contractors to comply with EVMS Guidelines encourages them to use effective internal cost and schedule management control systems, and permits the Government to rely on timely data produced by those systems for determining product-oriented contract status. However, compliance should only be required when contract cost and complexity merit the cost of compliance with EVMS Guidelines.

For cost or incentive contracts and subcontracts valued at $20,000,000 or more, the earned value management system shall comply with the guidelines in the American National Standards Institute/Electronic Industries Alliance Standard 748, Earned Value Management Systems (ANSI/EIA-748). For cost or incentive contracts and subcontracts valued at $50,000,000 or more, the contractor shall have an earned value management system that has been determined by the cognizant Federal agency to be in compliance with the guidelines in ANSI/EIA-748. For cost or incentive contracts and subcontracts valued at $20,000,000 or more, the earned value management system shall comply with the guidelines in the American National Standards Institute/Electronic Industries Alliance Standard 748, Earned Value Management Systems (ANSI/EIA-748); however, it is not required to be formally determined compliant by the cognizant Federal agency to be in compliance. For cost or incentive contracts and subcontracts valued at $50,000,000 or more, the contractor shall have an earned value management system that has been determined by the cognizant Federal agency to be in compliance with the guidelines in ANSI/EIA-748. ((DFARS 252.234-7001, DFARS 252.234-7002).

In regards to DFARS 252.242-7001 and 252.242-7002, the contractor is required to have an EVMS that complies with ANSI/EIA-748; however, the Government will not formally accept the contractor’s management system (no compliance review). While not required, if a risk-based decision is made to require EVM on cost or incentive contracts valued at less than $20 million or FFP contracts, the above paragraph should be included in the statement of work.

If you are assigned to another agency, consult agency guidance for contracting situations that require contractor compliance with EVMS Guidelines.

- **Stipulating a Work Breakdown Structure.** The framework for EVMS is the Work Breakdown Structure (WBS) and the contractor’s baseline plan developed using that structure.
  - The WBS is a product-oriented family tree division of hardware, software, services, and other work tasks which organizes, defines, and graphically displays the product to be produced, as well as the work to be accomplished to achieve the specified product.
  - When you expect that the contract will require the contractor to comply with EVMS guidelines, the request for proposal should require the offeror to provide cost information based on a WBS identified in the solicitation. The offeror can provide more levels of information than required by the solicitation, but the firm cannot provide fewer.
  - The multiple levels of the WBS "explode" the work required down to identifiable work packages that relate costs to specific contract effort. In a common WBS:
    - Level 1 is the entire system;
    - Level 2 identifies the major elements of Level 1;
    - Level 3 identifies the major elements of Level 2; and
    - Each lower level provides increasingly detailed information.

The following table provides an example of a 3-level WBS structure. The example is for a missile system, but the concept can be applied to any large system. The program work breakdown structure provided to the contractor is typically to Level 3 of the WBS. According to DoD guidance, the top 3 Levels of the Program WBS must conform to the appropriate Appendix in MIL-HDBK-881A for the particular type of system/effort. The contractor will then extend the WBS to the lowest level necessary for effective management. EVMS reporting typically occurs at Level 3, however, reporting can be required to a lower level of the WBS for those elements deemed higher risk to allow for more comprehensive oversight and analysis. The same WBS structure is required for the Contract Performance Report, the Integrated Master Schedule, and any other cost reports such as the Contractor Cost Data Reports (CCDR) (required on
## Missile System Work Breakdown Structure, Levels 1-3

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missile System</td>
<td>Air Vehicle</td>
<td>Propulsion (Stages 1..n)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Payload</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Airframe</td>
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<tr>
<td></td>
<td></td>
<td>Reentry System</td>
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<tr>
<td></td>
<td></td>
<td>Post Boost System</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guidance and Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ordnance Initiation Set</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Airborne Test Equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Airborne Training Equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Auxiliary Equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Integration, Assembly, Test and Checkout</td>
</tr>
<tr>
<td>Command and Launch Equipment</td>
<td>Surveillance, Identification, and Tracking</td>
<td>Sensors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Launch and Guidance Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Command and Launch Applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Software</td>
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<td>Command and Launch System Software</td>
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<tr>
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<td></td>
<td>Launcher Equipment</td>
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<td></td>
<td>Auxiliary Equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Booster Adapter</td>
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<tr>
<td>Training</td>
<td>Equipment</td>
<td>Support and Handling Equipment</td>
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<tr>
<td></td>
<td>Services</td>
<td>Test and Measurement Equipment</td>
</tr>
<tr>
<td></td>
<td>Facilities</td>
<td></td>
</tr>
<tr>
<td>Peculiar Support Equipment</td>
<td>Test and Measurement Equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support and Handling Equipment</td>
<td></td>
</tr>
<tr>
<td>System Test and Evaluation</td>
<td>Development Test and Evaluation</td>
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<tr>
<td></td>
<td>Operational Test and Evaluation</td>
<td>Operational Test and Evaluation</td>
</tr>
<tr>
<td></td>
<td>Mock-ups/System Integration Labs (SILs)</td>
<td></td>
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<tr>
<td></td>
<td>Test and Evaluation Support</td>
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<tr>
<td></td>
<td>Test Facilities</td>
<td></td>
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<tr>
<td>Systems/Project Management</td>
<td>Systems Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Project Management</td>
<td></td>
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<tr>
<td>Data</td>
<td>Technical Publications</td>
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<td></td>
<td>Engineering Data</td>
<td></td>
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<td></td>
<td>Management Data</td>
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<td></td>
<td>Support Data</td>
<td></td>
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<tr>
<td></td>
<td>Data Depository</td>
<td></td>
</tr>
<tr>
<td>Operational/Site Activation</td>
<td>System Assembly, Installation, and Checkout on Site</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contractor Technical Support</td>
<td></td>
</tr>
</tbody>
</table>
### 4.1 Identifying And Analyzing Cost And Schedule Variances (cont)

- **Establishing A Contract Cost/Schedule Baseline.** When the contract requires EVMS compliance, a multifunctional Integrated Baseline Review (IBR) must be conducted after contract award. Government participants in the review will normally include engineers, other technical personnel, EVMS support personnel, and program management personnel. Together with contractor representatives, this team will review the contractor’s baseline plan to ensure all work has been planned appropriately, budgets are adequate for accomplishment of the planned work, and the appropriate method for claiming “earned value” has been identified. This will normally include work authorizations, schedules, work package budgets, and progress measurement methods.

- IBRs are intended to provide a mutual understanding of risks inherent in contractor's performance plans and underlying management control systems. An effective IBR:
  - Lays a solid foundation for mutual understanding of project risks;
  - Provides an invaluable opportunity to compare PMs’ (government and contractor) expectations and to address differences before problems arise;
  - Provides project management teams with a thorough understanding of the project plan and its risks, allowing early intervention and the application of resources to address project challenges;
  - Increases confidence in the project Performance Measurement Baseline (PMB), which provides a powerful, proactive, program management capability to obtain timely and reliable cost and schedule projections.

The goal of a successful IBR is to ensure consistent understanding and expectations on the part of the government and contractor and that the contractor has a well-supported plan for successful contract performance. It is important to note that the IBR is not the end objective. It is one element of an iterative, continuing process that provides a structure for program management to openly discuss the project's plan, strengths, and risks.

- **Comparing Actual Cost/Schedule With The Baseline.** Each month during contract performance, the contractor will submit a Contract Performance Report (CPR) that compares actual performance with budgeted performance and establishes a common reference point for identifying variances. CPRs provide key information on:
  - **Budgeted Cost of Work Scheduled (BCWS).** BCWS is the amount budgeted for work scheduled to be accomplished. It is also called planned value. It is a time-phased expenditure plan, measurable for the current, cumulative-to-date, and contract completion time periods. When the BCWS is time-phased over the life of the contract, it becomes the Performance Measurement Baseline or PMB. The summation of all the BCWS for the program (BCWS cumulative) is equal to the Budget at Completion or BAC.
  - **Budgeted Cost of Work Performed (BCWP).** BCWP is the amount budgeted for that portion of the scheduled work that was actually performed (i.e., what the contractor
planned or budgeted to spend for the work actually accomplished). This is also called
earned value.

- **Actual Cost of Work Performed (ACWP).** ACWP is the amount actually spent in the
accomplishment of work performed. The amount actually spent includes direct costs (e.g.,
labor and material) and indirect costs (e.g., overhead and G&A expense).

The following example demonstrates how BCWS, BCWP, and ACWP can be used to identify contract
cost/schedule variances:

```
<table>
<thead>
<tr>
<th>Budgeted Cost of Work Scheduled (BCWS)</th>
<th>$38,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule Variance (BCWP-BCWS)</td>
<td>$11,000</td>
</tr>
<tr>
<td>Budgeted Cost of Work Performed (BCWP)</td>
<td>$49,000</td>
</tr>
<tr>
<td>Cost Variance (BCWP-ACWP)</td>
<td>($8,000)</td>
</tr>
<tr>
<td>Actual Cost of Work Performed (ACWP)</td>
<td>$57,000</td>
</tr>
</tbody>
</table>
```

In this example, the contractor has a positive schedule variance indicating the contract is ahead of
schedule. BCWP is $11,000 greater than BCWS. That is almost 29 percent more work completed than
was scheduled. However, for the work performed, the contractor has a negative cost variance indicating
the contract is over budget. The ACWP is $8,000 more than the BCWP. That is approximately 16 percent
over budget.

- **Analyzing Reported Variances.** Note that the calculations above identify an area where actual
contract costs exceed budgeted costs but do not explain how the variances will affect the total
contract. To permit more detailed analysis, a Contract Performance Report or CPR is required
when EVM is required on the contract. The CPR includes five different presentation formats:
  - An analysis of performance by work breakdown structure (WBS) element. (Format 1)
  - An analysis of performance by organizational category (Format 2);
  - A time-phased contract budgeted cost baseline for contract completion (Format 3);
  - A time-phase manpower loading estimate for future contract completion (Format 4); and
  - A narrative explanation and analysis of significant variances (Format 5).

These five formats are required for contracts greater than or equal to $50,000,000. On contracts valued at
or greater than $20,000,000 but less than $50,000,000, it is recommended that CPR and IMS reporting
be tailored. Tailoring to the specific needs of the program is highly encouraged. For contracts less than
$50,000,000, the formats can be tailored in certain areas based on a program risk assessment. Specific
areas that can be tailored for contracts less than $50,000,000 include: Format 1 & 2 reporting levels,
reporting frequency, submission dates, date of first and last reports, Format 5 variance reporting
thresholds, fixed number of variances, percentage or dollar thresholds, specific variances, contractor
format, or electronic data interchange format. More information on tailoring the CPR can be found in
Paragraph 2.2.5.6.3 of the Earned Value Management Implementation Guide or EVMIG located on the
DCMA website (http://www.dcma.mil/).

A key point to remember is that the data presented in the CPR is cost data, and does not include
fee/profit. The CPR is required monthly, unless the reporting frequency is tailored.
When analyzing variances, you will normally need support from Government technical personnel to review the contractor’s analysis in technical performance areas. This analysis will help determine the reason for, and the significance of, any cost variance.

- **Example Of Performance Analysis By WBS Element.** The table below presents key CPR information for several elements of the contract WBS.

<table>
<thead>
<tr>
<th>Cost Performance Report Work Breakdown Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget Baseline</td>
</tr>
<tr>
<td>$1.5 mil</td>
</tr>
<tr>
<td>WBS Element</td>
</tr>
<tr>
<td>1.1</td>
</tr>
<tr>
<td>1.2</td>
</tr>
<tr>
<td>1.3</td>
</tr>
<tr>
<td>1.4</td>
</tr>
<tr>
<td>1.5</td>
</tr>
<tr>
<td>1.6</td>
</tr>
<tr>
<td>Subtotal</td>
</tr>
<tr>
<td>Mgt. Reserve</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Based on the above report, you could make the following observations:

- **WBS Element 1.1.**
  - Comparison of BCWS, BCWP, and the Cost-at-Completion Budgeted reveals that all are equal and the work is complete.
  - Comparison of BCWP and ACWP reveals that the element experienced a $10,000 cost overrun at completion.
  - Comparison of the Cost-at-Completion Budgeted, Estimated, and Variance columns also reflect the $10,000 cost overrun.

- **WBS Element 1.2.**
  - Comparison of BCWS with BCWP reveals that the work is behind schedule (SV=($5,000))
  - Comparison of BCWP with ACWP shows that the contractor is slightly underrunning
budgeted cost. (CV=$1,000)

- Comparison of the Cost-at-Completion Budgeted, Estimated, and Variance columns indicates that the work is expected to be on budget at completion.

- WBS Element 1.3.
  - Comparison of BCWS with BCWP reveals that the work is ahead of schedule. (SV=$150,000-$130,000=$20,000)
  - Comparison of BCWP with ACWP shows that the contractor is experiencing a slight overrun of $5,000 over budgeted cost.
  - Comparison of the Cost-at-Completion Budgeted, Estimated, and Variance columns indicates that the overrun is expected to grow to $10,000 at completion.

- WBS Element 1.4.
  - Comparison of BCWS with BCWP reveals that the work is on schedule.
  - Comparison of BCWP with ACWP shows that the contractor is experiencing an underrun of $15,000.
  - Comparison of the Cost-at-Completion Budgeted, Estimated, and Variance columns indicates that the underrun is expected to remain at $15,000 through completion.

- WBS Element 1.5.
  - Comparison of BCWS with BCWP reveals that the work is ahead of schedule. (SV-$10,000)
  - Comparison of BCWP with ACWP shows that the contractor is experiencing an overrun of $10,000. (CV=($10,000))
  - Comparison of the Cost-at-Completion Budgeted, Estimated, and Variance columns indicates that the overrun is expected to grow to $15,000 at completion.

- WBS Element 1.6.
  - Comparison of BCWS, BCWP, and the Cost-at-Completion Budgeted reveals that all equal and the work under is complete. (BCWScum=BAC)
  - Comparison of BCWP and ACWP reveals that the element experienced a $20,000 overrun at completion.
  - Comparison of the Cost-at-Completion Budgeted, Estimated, and Variance columns also reflect the $20,000 overrun.

- Subtotal.
  - Comparison of the Cost-at-Completion Budgeted, Estimated, and Variance Subtotals reveals a projected net overrun of $40,000. Since the contractor had set aside a management reserve of $50,000, the contract is still within the original Budgeted Cost baseline with $10,000 of management reserve remaining. There appears to be little need for in-depth technical analysis at this time because the contractor is still within the original Budget Cost baseline and the contract is 76 percent complete.

If the percent complete on the contract had been less, then further analysis would probably be warranted. Relying solely on the contractor's estimate at completion is risky. For this reason, the program will calculate their own Estimate at Completion using statistical methods and trend data to project costs at the end of the effort. This analysis can be augmented by evaluations into specific technical areas (or WBS elements) experiencing negative cost and/or schedule variances. For example, this technical evaluation can utilize an analysis of Technical Performance Measures or TPMs. For example, the TPM for fuel consumption shown below shows actual performance above the expected upper threshold limit, but it is trending toward the goal or objective. If WBS Element 1.5 in the CPR above was for the engine of the
missile (ahead of schedule but over cost), we would analyze the TPMs that could be causing this situation and have our technical experts evaluate the contractor’s narrative explanation for variances in Format 5 of the CPR.
More will be discussed later in this Chapter on calculating Estimates at Completion.

Cost/Schedule Status Reports. This is no longer a valid report based on the Mar 2005 changes to the DoD EVMS application thresholds and reporting requirements. You may, however, still see the C/SSR on contracts awarded prior to the 2005 change. Analysis of C/SSR cost/schedule data is consistent with the analysis described above for the Contract Performance Report (CPR).
Contract Funds Status Report (Defense Acquisition Guidebook, para 11.3.2.1). For flexibly-priced contracts, you may also consider requiring a continuing detailed report on the status of contract funding. You may require this report in addition to or instead of the type of cost/schedule reporting described above. One example of this type of reporting is the DoD Contract Funds Status Report (CFSR). The CFSR is reported at price rather than cost (includes fee or profit). This form should be reconciled with the CPR quarterly to evaluate the adequacy of program funding levels.
According to the Defense Acquisition Guidebook, the CFSR supplies funding data about defense contracts to program managers for:

- Updating and forecasting contract funds requirements;
- Planning and decision making on funding changes in contracts;
- Developing funds requirements and budget estimates in support of approved programs;
- Determining funds in excess of contract needs and available for de-obligation;
- Obtaining rough estimates of termination costs; and
- Determining if sufficient funds are available by fiscal year to execute the contract.

The program manager should obtain a CFSR (DD Form 1586) on contracts over 6 months in duration. The CFSR has no specific application thresholds; however, the program manager should carefully evaluate application to contracts valued at less than $1.5 million (in then-year dollars).

**Reporting.** DID DI-MGMT-81468 should be used to obtain the CFSR. The contracting officer and contractor should negotiate reporting provisions in the contract, including level of detail and reporting frequency. The program manager should require only the minimum data necessary for effective management control. The CFSR should not be applied to Firm-Fixed Price contracts unless unusual circumstances dictate specific funding visibility. The requirement for Contract Funds Status Reporting should be tailored to the specific contract involved. The CFSR is normally required quarterly and must provide enough information for Government personnel to compare the estimate of total funds required to complete authorized contract work with existing contract funding.

**Analyzing Report Information.** These reports can be combined with cost information from contractor requests for progress payment or cost-reimbursement vouchers to obtain a general
picture of contract progress compared to costs expended. If you identify an apparent problem, you should request a technical review of the contractor's physical progress toward contract completion.

**Progress Payment Requests (FAR 32.503-4 and FAR 32.503-5).** A contractor making a request for progress payments must complete a [Standard Form (SF) 1443](#). Contractor's Request for Progress Payment. As part of the request, the contractor must identify total costs to date and estimated additional cost to complete the contract. The estimated additional cost to complete the contract may be the last estimate made, adjusted for costs incurred since the last estimate. However, the contractor must update the estimate at least semi-annually.

- Before making progress payments, you must establish the reliability of the contractor's accounting system and controls. Once you have done that, you may rely on the accounting system and the certification on the SF 1443 when making a progress payment.

- Normally, you should not request an audit of individual progress payment requests. However, you should consider requesting an audit if you have reason to:
  - Question the reliability or accuracy of the contractor's certification on the SF 1443, or
  - Believe that the contract will involve a loss.

- While you may rely on the contractor's accounting system and certification without prepayment review, you must make periodic reviews to determine the validity of progress payments already made or expected to be made. These post-payment reviews must include a number of elements including a determination that the contract price will be adequate to cover the anticipated cost of contract completion or that the contractor has adequate resources to complete the contract. A review of the contractor's actual physical progress should be a part of these post-payment reviews.

**Cost-Reimbursement Vouchers (FAR 52.216-7(b)).** Under cost-reimbursement contracts, the contractor can submit vouchers or invoices for payment of costs. Unlike the Contractor's Request for Progress Payment, the contractor is not required to submit an estimate of the cost to complete the contract with the cost-reimbursement voucher. However, the vouchers do provide an excellent record of the contractor's costs that can be coupled with other information such as production surveillance and reporting documents to identify potential cost overruns. The record includes:

- Those recorded costs that, at the time of the request for reimbursement, the contractor has paid by cash, check, or other form of actual payment for items or services purchased directly for the contract.

- Costs incurred, but not necessarily paid for, including:
  - Materials issued from the contractor's inventory and placed in the production process for use on the contract;
  - Direct labor;
  - Direct material;
  - Other direct in-house costs; and
  - Properly allocable and allowable indirect costs.

- The amount of progress payments that have been paid to the contractor's subcontractors.

- Contractor contributions to any pension or other post-retirement benefit, profit sharing, or stock ownership plan paid in accordance with contract requirements.

**Limitation of Cost/Funds Notice.** All cost-reimbursement contracts must include a contract clause limiting the Government's obligation to reimburse contractor costs. As shown in the table below, each of the clauses used to limit the Government's obligation also requires contractor notification that total costs are approaching that limit.
<table>
<thead>
<tr>
<th>If the contract is...</th>
<th>Then the contract must include the...</th>
<th>Which requires the contractor to notify the Government:</th>
</tr>
</thead>
</table>
| A fully-funded cost-reimbursement contract for other than consolidated facilities, facilities acquisition, or facilities use | Limitation of Cost clause (FAR 52.232-20) | Whenever the Government share of contract costs is expected to...  
- Exceed a stated percentage (normally 75 percent) of estimated contract cost within a stated period (normally 60 days); or  
- Be either greater or substantially less than previously estimated. |
| A cost-reimbursement contract for consolidated facilities, facilities acquisition, or facilities use | Limitation of Cost (Facilities) clause (FAR 52.232-21) | Whenever the Government share of contract costs is expected to...  
- Exceed 85 percent of estimated contract cost within the next 30 days; or  
- Be either greater or substantively less than previously estimated. |
| An incrementally-funded cost-reimbursement contract | Limitation of Funds clause (FAR 52.232-22) | Whenever the Government share of contract costs is expected to exceed a stated percentage (normally 75 percent) of the amount so far allocated to the contract cost within a stated period (normally 60 days). Sixty days before the end of the period specified in the contract schedule of the estimated amount of funds (if any) required to continue timely performance. |
| A time-and-material or labor-hour contract. | Payments Under Time-and-Materials and Labor-Hour Contracts clause (FAR 52.232-7) | Hourly rate payments and material costs are expected to...  
- Exceed 85 percent of the ceiling price within the next 30 days; or  
- Be substantially greater or less than the stated ceiling price. |

DO NOT expect contractor notification requirements to replace effective contract surveillance! You should be questioning significant variations long before contractor notification. By the time you receive contractor notification, it may be too late for the contractor to take corrective action. In fact, the contractor may fail to provide timely notice despite the contract requirement. There have been many contracts where the contractor did not provide notice until after all contract funds were expended. Using a CPR and CFSR can give warning of significant variations in cost so that planning can be accomplished in time to react to budget shortfalls.

**Gantt or Phase-Planning Charts.** One of the most common techniques for managing schedules for both supply and service contracts is the Gantt Chart (also known as the Phase-Planning Chart). The Gantt
The Gantt chart above depicts the critical tasks required to develop a Management Information System (MIS) Plan. For each task:

- The estimated days required to complete the task are identified along with a graphic representation of the length of time required.
- In the graphic presentation, bars representing contract effort and a grid scaled to the indicated time (e.g., weeks in the example above) are used to indicate the estimated length of time required to complete each task.
- As the work is performed, the bars may be shaded to indicate the time worked.
- If more time than estimated is required to complete a task, the related bar is extended.
- When the task is completed, the actual days required are also annotated.

With some understanding of the effort required, you can use this Gantt chart to identify schedule problems that will affect the cost to complete the project. For example, the chart above shows that the performance specifications should be completed before work begins on the general system concept. If development of the performance specifications took 10 days instead of three, that delay could affect the entire project. The contractor would need to examine ways of shortening other tasks or performing tasks concurrently to meet the required schedule.

If the problems extend the time required to complete an activity on the critical path, the contractor must take action to identify cost effective ways to meet the original schedule. With a GANTT chart, identifying the critical path can be difficult since relationships between tasks and interdependencies aren't indicated. We will look at other scheduling techniques that do allow for the identification of the critical path for the project such as PERT or network schedules.

However, when there is a threat to the contract schedule or cost estimates, you should call upon Government technical personnel to examine the contractor's estimates.

**Production Flow Charts.** Production flow charts can be developed to more clearly define contract schedules. The production flow chart is developed using the major schedule milestones, production sequence, and projected manpower. The example below depicts the first unit flow chart for production of a new product.

The flow time for each of the assemblies is determined by utilizing the estimated labor-hours, crew sizes, and the operations shifts projected for contract performance.
With the overall sequence of the major activity defined, activities can be scheduled for completion to meet subsequent events which are dependent upon them. Start times for each activity will be determined by estimating when the activity must be completed and the estimated time required to complete the activity.

**T&PP** - Tools and Production Planning
**PCR** - Production Control Records
**FTBO** - Flow Time Between Orders
**UBO** - Unit Buy Off
**PKG** - Package
**Tran** - Transportation

All Flow Times are Shown in Days

Using this procedure, the entire schedule can be displayed on a single chart. All organizations can determine at a glance when their responsibilities start, the estimated time required, and the required completion time. The effect of any delay on the overall schedule becomes obvious.

In the chart above, if circuit card assembly and test required 22 days instead of 20, the overall project would not be delayed because of the 5-day flow time between orders. However, if circuit card assembly and test required 40 days because of production problems, contractor corrective action would be necessary to meet the original schedule.

With knowledge of the interrelated activities required for production, Government personnel could raise questions regarding contractor corrective actions. Contractor projected actions could be evaluated for effectiveness and potential effect on cost.

**Program Evaluation and Review Technique.** The Program Evaluation and Review Technique (PERT) takes the analysis of production flow one step further. PERT permits the contractor to analyze the relationships of all elements needed to complete a project and identify the critical path -- the path that defines the estimated time required to complete the project.

If an element requires more time than estimated, PERT permits analysis of the effect on timely project completion (the critical path). If the increased time required to complete the element does not affect the critical path, no management action may be required. If the completion schedule is affected, PERT permits analysis of alternative corrective actions and the cost associated with each action. An evaluation of the network schedule along with the CPR schedule variance can be used in conjunction to determine project schedule impacts.

**PERT Network Structure.** To understand PERT analysis, you must first understand PERT network structure. The PERT network is composed of events and activities.

- **An event** is a specific milestone that must be reached before a new activity can begin. For example, a foundation must be completed before a contractor can start erecting a building frame. On a PERT chart, events are typically shown as circles or nodes.
- **An activity** is the work effort over a period of time required to achieve a specific event.
On a PERT chart, activities are shown as the lines that connect the event circles, and in effect define the relationships of the activities and events required to complete a project.

The figure below depicts a PERT network. Network events are labeled with letters (e.g., A, B, C, etc.). The activity that begins at A and ends at B is referred to as AB. Note that activities AB, BE, AC, CD, and DE, all must be completed before Event E can be achieved.

- **Activity Times.** The next thing needed to develop the PERT network is information on the length of time to accomplish each activity. PERT uses three estimates of the time required to complete each activity.

\[
\text{Activity Time} = \frac{a + 4m + b}{6}
\]

Where:
- \(a\) = Optimistic time -- the completion time if everything goes as well as can be expected.
- \(m\) = Most likely time -- the completion time if everything goes as expected.
- \(b\) = Pessimistic time -- the completion time if the things that may go wrong do go wrong.

To facilitate analysis and discussion, times for the activities in the network above are delineated in the following table.

<table>
<thead>
<tr>
<th>Activities and Times Required for Project Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>AB</td>
</tr>
<tr>
<td>AC</td>
</tr>
</tbody>
</table>
Early Start Times. If you assume that Event A is project start, you can work across the PERT network and determine how long it will take to complete the project. The times developed by working from the beginning to end are known as the Early Start Times or $T_e$. This is also called a "forward pass." When reading through the network below, note that:

- The $T_e$ entries are above the activity lines.
- The format of the $T_e$ entries is: Length of Time Required to Complete the Activity (Activity Start Time, Start Time Plus Length of Time Required to Complete the Activity). For example:
  - Activity AB reads "3(0,3)", which means it will take three months to complete the activity, the activity can begin at project start (Month 0), and it will end at the end of Month 3.
  - Activity BE reads "2(3,5)", which means that it will take two months to complete the activity, the activity can begin at the end of Month 3, and it will end at the end of Month 5.

When more than one activity ends at an event, the earliest start time for the next activity is the latest time coming into the event. For example, DE is projected to be complete at the end of Month 3, but since BE is not projected to be complete until the end of Month 5, any activities beginning at E cannot start until the end of Month 5.

Late Start Times. Based on the PERT network developed so far, the project should take sixteen months to complete. The next step is to determine $T_l$, or Late Start Times -- the latest time that an event can start and still complete the project on time. The $T_l$ is calculated the same way as $T_e$ except the calculation is done from the end of the project back to the beginning. This is also called a "backward pass." When reading through the network below, note that:

- The $T_l$ entries are below the activity lines.
- The format for $T_l$ is similar to the format for $T_e$. For example
  - Activity HI reads "2(14,16)", which means that it will take two months to complete the
activity. If the activity is to end at Month 16, it must start no later than Month 14.

- Activity FH reads, "4(10,14)", which means that it will take four months to complete the activity, and if the activity is to end at Month 14, it must start no later than Month 10.

When more than one activity begins at an event, the earliest TI is used to calculate the TI for activities prior to the event. For example, EF has a TI of Month 7 while EG has a TI of Month 5. The end time used to calculate BE and DE would be the earliest available TI or Month 5.

- **Critical Path.** Given the information now available, you can identify the Critical Path. The longest of these paths (a-b-e-g-h-I) is sixteen days which is the **shortest** time in which the entire network can be completed. This is called the **critical path** of the network -- the path where the difference between Te and Ti (slack time or float) equals zero. The following table and network show the critical path - AB, BE, EG, GH, and HI.

<table>
<thead>
<tr>
<th>Activity</th>
<th>AB</th>
<th>AC</th>
<th>BE</th>
<th>CD</th>
<th>DE</th>
<th>EF</th>
<th>EG</th>
<th>FH</th>
<th>GH</th>
<th>HI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Ti</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Slack Time</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Cost/Schedule Impact.** With the critical path established, you can consider the impact of any activity time change.

  - Any increase or decrease in the time required to complete any activity on the critical path will increase or decrease the time to complete the entire project.

  - If the time required to complete Activity HI grew from two months to three months, then the entire project time would be increased by one month.

  - If there is a need to accelerate the project schedule, then management knows which activities must be shortened to shorten the project (critical path activities), and can
evaluate the cost/schedule trade-offs.

- For activities not on the critical path, changes do not impact the entire project time.
- If the time required to complete Activity FH grew from four to five months there would be no increase in total project time because no activities beyond Event H can begin until all activities leading up to Event H have been completed. Activity FH would still be completed a full month ahead of Activity GH.
- If the time to complete Activity FH were accelerated to three months, again there would be no effect on the time required to complete the project. Activity GI could still not begin until Activity FH is completed.

**Precedence Diagram Method (Network Scheduling).** This analysis can also be done using the Precedence Diagram Method which allows for the identification of Early Start/Finish, Late Start/Finish, float, and critical path.

There are four items that must be identified as part of the scheduling process: tasks, durations of tasks, order of tasks, and constraints. The tasks should include all the work and activities that need to be done to accomplish the work, and they should be traceable back to the Work Breakdown Structure (WBS). The duration of each task should be a measure of how long the work will take. It is most frequently measured in days, either calendar or work days. Once the durations have been identified, the order of the tasks must be determined along with the criteria for starting each task. For example, must Task A be completed before Task B can start or can they occur simultaneously? Finally, any constraints on resources must be highlighted and worked into the schedule. This is called resource loading and it can include facilities, such as test ranges, or manpower limitations.

When developing a network schedule, it is important to understand two key terms: baseline and schedule. The baseline is the original approved plan for accomplishing project objectives. In terms of EV, this will be the Performance Measurement Baseline or PMB. The schedule, on the other hand, reflects actual accomplishments and the planned projections for completing remaining objectives. The figure below shows several different baseline vs. schedule relationships that must be understood in order to analyze schedule performance.

**Baseline Versus Schedule**

![Baseline Versus Schedule Diagram](image)

The blue line is time now and it is used to evaluate actual accomplishment against the baseline. The green lines represent the baseline for each task, the black lines represent actual or planned performance, and the black progress bar denotes the percent complete of each task. By evaluating each task, you can determine whether the task is on schedule or has slipped, and whether the duration has remained the
same or increased. For example, the duration of Task A has increased (schedule line is longer than the baseline) and it has slipped because the end date is beyond the original baseline completion date. For Task B, the duration appears to be the same length, however, the task has slipped. All of the tasks on this schedule appear to be related because as Task A slipped, it affected the start/finish of the remaining tasks. In order to more fully evaluate the impact of slips, we can use the precedence diagram method.

**Precedence Diagram Method (PDM) Task Relationships**

Early Start and Early Finish, as determined by the “forward pass,” are shown at the top of the box. Late Start and Late Finish, as determined by the "backward pass," is reflected at the bottom of the box. The task duration (typically # of days) is annotated in the top right corner of the box.

PDM is similar to PERT, however, it allows for multiple task relationships to be used in the development of the schedule. A fundamental understanding of scheduling techniques revolve around the task and its relationship to other tasks. There are three main task relationships: Finish-to-Start, Finish-to-Finish, and Start-to-Start. The following three figures demonstrate these three primary task relationships in the PDM format and how they would be presented in Microsoft Project.

**Finish-to-Start**

\[ A \rightarrow B \]

*B cannot start until A is finished*

**Finish-to-Finish**
Given a combination of task relationship types, the next step is to recognize the “time” factor or the lag in the relationship of one or more tasks to every other task in the project. Many tasks will not have any lag built into the relationship; the follow-on task can begin as soon as the preceding task is completed. However, some tasks may have a “wait” time necessary before the follow-on task can start. The relationship lag allows for the optimum application of resources to accomplish the tasks in a complex project. An example of this relationship may be painting a room. You cannot start to hang pictures until 1 day after painting is complete; this allows the paint to dry completely.
When performing a schedule analysis, we have to determine the critical path. We begin by calculating the earliest finish time (EFT), latest finish time (LFT), and float. Float is defined as the amount of time an activity can be delayed or expanded before it impacts the project finish time \((LFT - EFT = \text{Float})\). Critical path items are those items that have zero float. This means that when a task on the critical path slips, the entire schedule slips.

Schedule analysis and identification of the critical path are key components of a robust analysis of contract status. EVM metrics, along with the schedule analysis, provide a more complete picture of contractor performance. For example, a negative schedule variance (SV) indicates the contractor is behind schedule, however, we cannot really tell whether the contract will finish late without determining whether the tasks with the negative schedule variance are on the critical path. If they are not on the critical path, then we still have float in the schedule and may still complete the contract on time. If the tasks are on the critical path, then we know a negative SV will mean an overall schedule slip.

To obtain detailed contractor schedule information, we will use the Integrated Master Schedule (IMS). An IMS is required within DoD when EV is required on a contract (> $20,000,000). It is provided by the contractor monthly as a Contract Data Requirements List (CDRL) deliverable. DI-MGMT-81650 is the IMS data item included in the CDRL. For contracts between $20,000,000 and $50,000,000, the IMS can be tailored for degree of networking, report frequency, submission dates, date of 1st and last reports, frequency of schedule risk analysis, and electronic data interchange format. More information on tailoring the IMS can be found in Paragraph 2.2.5.7 of the Earned Value Management Implementation Guide or EVMIG located on the DCMA website (http://www.dcma.mil/).

**Problem Analysis.** If the problems extend the time required to complete a task, the contractor must determine the effect on the remaining schedule. If timely performance is affected, the contractor must take action to identify cost effective ways to shorten the critical path to meet the original schedule.

Without an integrated network schedule, the manager must evaluate the various arguments on an almost daily basis as to where to apply limited resources. This frequently results in management emphasis being pulled away from the actual time drivers on the schedule that would have been visible with a network analysis and could result in unforeseen program slips. With network analysis, crisis management is reduced because management will know which items can slip and which cannot without major impact to the master program schedule. When there is a schedule or cost risk to the Government, you should request Government technical personnel to examine the contractor's analysis and projected action to correct the problem.

**Progress Review Meetings.** Regularly scheduled progress review meetings provide an excellent forum for the identification and resolution of contract problems that may affect contract cost and performance. Many contracts include a requirement for periodic review meetings. When there is no contract requirement and you feel that such meetings would be beneficial, consider suggesting an informal review program to the
contractor as a forum for sharing concerns, before they become problems.

- **Management Review Meetings.** Management review meetings typically include key members of the contractor and Government contract teams (e.g., program management, contracting, technical, quality assurance, and others).
  - Together, you can evaluate overall contract status, including the identification and resolution of problems that may be affecting contract cost or schedule.
  - The contractor may be required to submit a contract status report as a Contract Data Requirements List (CDRL) deliverable prior to each review. Those status reports then become the basis for conference analysis and discussion.
  - You should encourage open discussion to identify problems that may affect contract schedule or cost as early as possible so that action can be taken to resolve them and minimize their effect.

- **Technical Team Meetings.** Periodic meetings between Government and contractor technical personnel provide a forum to discuss technical questions that may affect contract cost and schedule. These technical meetings can be used to supplement or replace the management team meetings described above.
  - As a supplement, these meetings can be used to resolve technical questions too complicated to be resolved at management team meetings.
  - As an alternative, these meetings provide a vital forum for the exchange of information and ideas.

Caution all participants in such meetings that contract changes can only be accomplished through written contract modification issued by the contracting officer. Agreements at the meetings cannot change the contract terms.

- Caution Government personnel not to issue direction to the contractor that is outside their authority under the contract. Remind them that they may be held personally responsible for any unauthorized commitment -- constructive change -- unless the commitment is ratified by the Government. Ratification by the government must be approved by the Head of the Contracting Agency. If a constructive change happens, it could lead to other complications such as an Anti-Deficiency Act violation if sufficient funds are not available to fund the change.

- Caution contractor personnel to notify the contracting officer immediately of any action by any Government personnel that they interpret as a change to the contract.

**Routine Observations by Government Personnel.** Even with all the available reports and management analyses, the first indication of potential cost/schedule problems often comes from routine observations by Government technical personnel.

- **Encourage Observation.** Routine observations by Government personnel could identify a variety of indicators of problems affecting timely and cost effective contract performance, such as:
  - Selection of work methods that are not suited to the contract effort;
  - Problems in completing critical tasks or production processes;
  - Inadequate personnel training or experience;
  - Labor unrest (i.e., dissatisfaction that could cause a slowdown in operations);
  - Inadequate tooling or equipment;
  - Excessive work in process inventory;
  - Excessive scrap rates; or
  - Comments about cost/schedule problems made by contractor personnel.

- **Encourage Reporting.** The biggest problem with routine observations as a source of information on potential overruns is that the observations are often not reported to the contracting officer. To
benefit from this source of information, you must foster the team concept and make every effort to keep the lines of communication open between yourself, the auditor, and such Government technical personnel as the user, Contracting Officer Representative (COR), Contracting Officer Technical Representative (COTR), Industrial Specialist, or Quality Assurance Representative (QAR). These specialists form the core of the acquisition team. They approach the contract from different perspectives but with one goal, effective and efficient contract performance. The Defense Contract Management Agency (DCMA) is also a key player in oversight of the contractor and can provide valuable assistance in identifying problems early.

- **Foster Communication.** By fostering communication between Government Acquisition Team members, you can benefit from the picture that is created when different pieces of the puzzle are brought together.
  - On a manufacturing contract, a QAR notes a large number of rejects from a particular process. At the same time, the Industrial Specialist notes that a shop responsible for that process is not meeting schedule commitments. Together, these bits of information paint a picture of a contractor that has significant quality problems that are affecting production and contract cost.
  - On an engineering services contract, the COTR feels that the Contractor Team Leader has only minimal experience in performing the type of work required by the contract. A Government Project Engineer feels that the Team Leader is putting unreasonable constraints on contractor personnel and these constraints are hampering contract operations. It may be that the contractor's failure to hire a qualified Team Leader is putting the contract schedule and cost performance in jeopardy.

### 4.2 Estimating Cost To Complete

**Support for Estimating Cost to Complete the Contract.** Whenever you suspect a cost overrun, remember that the contracting officer is ultimately responsible for monitoring contractor performance and estimated cost to complete the contract. However, the contracting officer should actively seek support from other members of the Government Acquisition Team.

- Assistance from Government technical personnel is essential in analyzing contract progress to date and estimating the amount of effort required to complete the contract.
- The auditor is the Government expert on contract cost. Audit assistance can be invaluable in verifying the actual contract cost incurred and validating data offered by the contractor to support projections of the cost to complete the contract.
- The requiring activity can provide valuable insight to the analysis process. As the organization responsible for managing funds, they must be involved in any decision to increase contract price or any decision to modify contract requirements to contain costs.
- Support from the acquisition integrated product team to include the program manager and EV analyst are key components to successful analysis of contract cost and schedule performance.

**Procedure for Estimating the Cost to Complete the Contract.** When developing an estimate of the cost to complete a contract:

- Determine the progress toward contract completion to date.
- Determine the cost of the contract work completed to date.
- Determine the reasons for variances from initial estimates.
- Estimate the amount of work remaining to be completed.
- Estimate the cost of the work remaining to be completed.

**Progress Toward Contract Completion.** Normally, the most difficult element of developing an estimate to complete the contract is determining the amount of work completed to date. It is relatively easy to determine the number of hours worked, wages paid, and material purchased, but those are measures of input—not measures of progress toward contract completion. It is not always easy to determine how
these inputs have contributed to completing the work required by the contract. To determine the work completed to date, you must rely on the sources and types of information identified in the previous section of this chapter:

- Contractually required cost/schedule analysis and reporting;
- Contractually required cost information;
- Contractor production management reports and analyses;
- Progress review meetings; or
- Observation by Government personnel.

Normally, the more detailed the information provided by the data source, the more valuable it is as a basis of estimating the cost to complete the contract. Contract progress reports typically provide a general overview of contract performance and specific detail only on a limited number of special interest items. However, detailed contractor CPR data would normally be more valuable than general contract production management reports, because the BCWS, BCWP, and ACWP data presented in the CPR provide detailed information on the contractor's cost/schedule performance. As the Performance Measurement Baseline (PMB) is developed (remember this is the time-phased BCWS), the contractor must identify methods to "take credit" for work completed. These measures range from subjective to more objective; the greater the understanding of these methods and how they affect the assessment of work completed, the better your estimate to complete will be as a forecast. A thorough understanding of earned value data will significantly enhance the value of the data used to project the cost to complete the effort.

As you analyze available information, you should request support from the using activity and Government technical personnel. They are the experts on Government requirements and contractor progress. When you request analysis support, establish an "as of" date for the analysis. That date can then be used for the collection of data on both contract work completed and the cost for completing that work.

**Cost of Work Completed to Date (FAR 32.503-4(b)).** In determining the cost of work completed, rely on contractor submissions and input from involved members of the Government Acquisition Team. Normally, the cognizant auditor plays a key role in evaluating cost information submitted by the contractor. However, others can play key roles, particularly when the contractor has implemented a management system that complies with EVMS Guidelines.

If the auditor has identified deficiencies in the contractor's accounting system, consult with the auditor to determine how those deficiencies may affect the contractor's recording of contract costs. You should also consult with DCMA to determine if any deficiencies have been identified, through routine surveillance, with the contractor's EVMS system (if validated). These deficiencies can also affect the validity, accuracy, and usefulness of reported data.

**Determine Reasons for Variances From Initial Estimates.** Before you can estimate the cost to complete the contract, you must determine the reason for the overrun.

- **Gather Information.** Solicit opinions from the contractor and Government Acquisition Team experts concerning the reasons for the overrun. Ask questions such as:
  - Why do actual costs differ from the original estimates?
  - Have circumstances outside the contract affected costs? For example, has a major reduction in business volume increased indirect cost rates and inflated contract costs?
  - Does the Government have any responsibility for the increased costs?
  - What can be done by the contractor and/or the Government to bring costs back into line?

If EV is required on the contract, the contractor must submit a Variance Analysis in Format 5 of the CPR. This narrative should address the reasons for the variance, the root cause, and any corrective actions planned to correct the problem. This is a good tool to keep overruns from becoming a surprise, and if done correctly, can provide valuable insight into the reasons for cost or schedule issues.

- **Identify The Reason.** The overrun could result from many possible reasons, including:
  - Conflicting interpretations of contract requirements; (however these should be resolved as part of the Post Award contract or the Integrated Baseline Review so they don't become an issue during contract execution)
One or more specific contract performance problems; or
- Generally poor contractor management of contract operations.

**Evaluate Current Status.** Evaluate available information to establish whether the situation that caused the overrun has been resolved.

*Estimate Amount of Work Remaining.* Once you have determined the amount of contract effort completed to date, it is relatively easy to estimate the tasks that remain to be completed. Again, you should request support from other members of the Government Acquisition Team as you perform your analysis. They can provide invaluable support in developing and evaluating both cost and schedule estimates for contract completion. Work remaining in EV terms is calculated as follows:

\[
\text{Budget at Completion} - \text{Budgeted Cost of Work Performed} = \text{Work Remaining}
\]

Once you have identified how much work remains, you need to decide if the contractor will continue to perform as they have so far on the contract or if issues have been resolved and performance will improve. Of course, there is also the alternative that performance will continue to decline. Trend analysis should be performed using cumulative EV data from CPRs.

*Cost of Work Remaining to be Completed.* Once you have determined the amount of work remaining and the causes for cost growth, you can estimate the cost to complete the contract. Given this information, estimating the cost to complete the contract is much like estimating the cost of a new contract.

- Select estimating methods and quantitative techniques based on the information available. You can develop estimates using any appropriate method -- round-table, comparison, or detailed. However, as the contractor progresses toward contract completion, you should expect more reliance on comparison and detailed estimates and less on round table estimates.

- Consider contract cost history along with other available data in estimate development. For example, where there has been a history of schedule delays and cost overruns, it may not be reasonable to assume that future contract effort will be completed as projected.

- Where there has been a history of schedule delays or cost overruns, it may not be reasonable to assume that future effort will be as projected.

- If there are cost or schedule constraints, develop several cost estimates based on different completion scenarios, such as:
  - Complete contract to original contract specification and schedule requirements.
  - Complete the contract to original specification requirements but allow additional time.
  - Complete the contract to original schedule requirements but reduce contract specification.
  - Adjust both the contract specification and schedule requirements.

This type of "bottoms-up" estimate will typically be developed by the contractor (at least an annually). The contractor will provide, as part of the CPR, a most likely cost to complete the project. The program office, however, will develop their own Estimate At Completion (EAC), typically using a formula-based approach based on trend analysis. There is a basic formula for calculating an EAC:

\[
\text{EAC} = \text{Actuals to Date} + \left(\frac{\text{Remaining Work}}{\text{Efficiency Factor}}\right)
\]

Actuals to Date = ACWP

Work Remaining = BAC - BCWP

The efficiency factor can vary depending on the determination of future contractor performance. Common efficiency factors include: cumulative CPI, 3 period average CPI, 6 period average CPI, composite index (CPI*SPI), or a weighted index (0.8CPI + 0.2 SPI).

If the reason for the overrun has been resolved, you can be much more certain of your estimate of the work required to complete the contract. If the issues have been resolved, the contractor could work at the original planned efficiency or continue at the current efficiency level. In this case, using the cumulative CPI as the efficiency factor would be appropriate. Within the DoD, the "rule of thumb" is that this efficiency factor generates the "best case" EAC projection. If the issues leading to the overrun have not been resolved, you must consider possible solutions and related risks as you develop your estimate. In this...
situation, you would need to choose an efficiency factor that best captures the performance expected and anticipated risks. For more information on Estimates At Completion (EAC) calculations, you can reference the Defense Acquisition University EVM Gold Card. It contains Earned Value Management terms, metrics, calculations, and policy information. It can be accessed at [https://acc.dau.mil/evm](https://acc.dau.mil/evm).

4.3 Resolving Potential Cost Overruns

Course of Action. Once the actual cost of work completed and estimates to complete have been identified, a course of action must be determined.

**Fixed-Price Contracts.** A cost overrun in a firm fixed-price contract, fixed-price economic price adjustment contract (unless the adjustment is based on actual cost), or fixed-price contract with prospective price redetermination contract will not affect contract price. A cost overrun on a fixed-price incentive contract or fixed-price contract with price redetermination may affect overall contract price, but the Government's contract obligation will be limited by the contract ceiling price.

While the effect on contract price will be limited, a cost overrun may have a substantial effect on contract performance. Additional costs will reduce profits and may result in a contract loss. Contractor efforts to control costs may result in decisions that affect the quality of contract performance. Accordingly, with fixed-price contracts, your primary efforts should generally be directed toward:

- Monitoring contract performance more closely to assure that all work is being accomplished in accordance with contract requirements, and
- Considering the need for adjustment in the liquidation rate for any progress payments based on cost.

**Cost-Reimbursement Contracts.** For cost-reimbursement contracts, you must determine the most appropriate action considering that the Government is responsible for reimbursing the contractor for all allowable costs up to the cost and funding limits established in the contract. The most common alternatives for action include:

- Withhold action until more information is available.
- Provide additional funds/time to complete the contract as is.
- Redefine the contract effort to fit existing funds.
- Allow the contract to continue without change.
- Terminate the contract.

As you determine the appropriate course of action, you should consider contract cost and other factors including: contract schedule, probable impact of not completing the contract, alternatives to completing the contract (e.g., terminate and reprocure from another source), availability and sources of funding, and many more.

**Withhold Action.** In situations where your analysis has identified cost or schedule variances, you may wish to stand pat (i.e., take no action until you can obtain additional information).

- Consider this course of action when:
  - You are not sure that the contractor cannot recover from current cost or schedule variances to complete the contract within the original cost and schedule.
  - You are awaiting additional information that may affect contract cost and schedule.
  - A major program management decision is in progress and the decision will affect the action you will take on the contract.
  - Funding is uncertain.

- When you withhold action awaiting more information, inform the contractor. Failure to put the contractor on notice can result in the Government assuming additional liability through constructive consent. Consider the following general steps to put the contractor on notice that the Government intends to withhold action pending further fact-finding:
  - Acknowledge that the Government is considering whether to add funds or increase the estimated contract cost.
Point out that the contractor is entitled to stop work when the contract dollar limit has been reached.

Admonish the contractor that any work done beyond the dollar limit will be at the contractor's own risk.

Provide Extra Funds/Time to Complete the Contract. When additional funding is available, the need exists, and the increase in cost is justifiable, the most logical course of action may be to continue contract performance following the original contract technical and schedule requirements. You should consider schedule relief, with or without extra funding, when contract problems have affected the contractor's ability to complete the contract on time.

Consider the following points when implementing a decision to add funds and/or change the contract schedule:

- Obtain necessary approvals for your proposed course of action.
  
  If you are planning to increase contract cost, establish the amount of additional funds required and obtain a funded purchase request from the requiring activity. This will require coordination with the Business Financial Manager to confirm sufficient funds are available for the correct fiscal year. If they are not, then funds may need to be reprogrammed from another program or requested through the Planning, Programming, Budgeting, and Execution (PPBE) system. Reprogramming is an option if funds are needed in the current fiscal year; PPBE if funds are needed in future years. The timing and amount of the shortfall are critical aspects to determine the flexibility in meeting increased funding requirements.

  If you are planning to change the contract schedule, obtain concurrence on any proposed delivery date changes from the requiring activity. In addition, many schedule changes will also require additional funding so this must be considered.

  If either of these changes will occur in a program, you should coordinate with the Program Manager. If either cost or schedule adjustment is significant, the PM will need to determine whether the changes will cause a breach of the Acquisition Program Baseline and additional reporting through the acquisition approval chain.

- Meet with the Contractor to review contract requirements and verify the remaining tasks, then negotiate the cost/time changes needed to complete the contract.

- Negotiate adequate consideration to the Government for increasing contract cost or revising the contract schedule (e.g., a reduction in potential contract fee).

- Execute and distribute a bilateral contract modification.

Redefine Contract Requirements to Fit Existing Funds. Redefining contract effort to fit available funds -- sometimes called downscoping -- can be a viable option for research contracts, as well as supply and service contracts with multiple line items. This option is particularly attractive when additional funds are not available, but it can also be employed when the requiring activity determines that marginal elements of the contract are not worth the additional money. Descoping the contract will have to be coordinated with the Program Manager to ensure user requirements are met and/or requirements documents are updated to reflect the change. If the descoping is within existing trade space, coordination with the PM may be adequate.

To implement a decision to reduce contract scope, use either a deductive contract modification or a partial termination for convenience. As you decide which one to use, consider the guidance presented in the paragraphs below. However, consult with your agency legal counsel before making a final decision on which approach is appropriate in your situation.

- **Deductive Contract Modification.** In general, you should use a deductive modification when the redefinition of contract requirements is within the scope of the original contract.
  
  For example, you can use a contract modification under the Changes clause to downsize requirements in a variety of ways, including changes in:

  - Specifications, drawings, or designs for supplies.
Description of services.
Method of shipping or packing.
Place of delivery or performance.
However, none of the Changes clauses available for cost reimbursement contracts provide for changes in quantity. Such changes are normally considered to change the scope of the contract.

- **Partial Termination for Convenience.** In general, a partial termination for convenience is appropriate when the redefinition of contract requirements will change the scope of the original contract. You should use a partial termination when:
  - You are redefining contract requirements by eliminating items from the contract.
  - The redefinition of other requirements (e.g., the description of services) is so substantial as to change the scope of the contract.

*Allow the Contract to Continue Without Change.* If you select this alternative, allow the contract to continue until funds expire.
- Consider this alternative when:
  - Additional funds are not available but continued contract performance will benefit the Government.
  - Most of the vital elements of the contract will be accomplished within current requirements and funding.
  - The cost of contract redefinition or termination will be greater than the cost of simply allowing the contractor to use available funds and then halting contract performance.
- If you select this alternative, it is absolutely critical that you:
  - Advise the contractor that additional funds will not be added to the contract.
  - Advise the contractor that any contract performance beyond current contract dollar limits will be at the contractor’s expense.
  - Not suggest that the contractor perform beyond current contract dollar limits.

*Terminate the Contract.* If you believe that the Government's best interests will be served by ending the contract immediately, terminate the entire contract for convenience.

**Appendix 4A, Earned Value Management System Guidelines**

**Organization.**
1. Define the authorized work elements for the program. A work breakdown structure (WBS), tailored for effective internal management control, is commonly used in this process.
2. Identify the program organizational structure including the major subcontractors responsible for accomplishing the authorized work, and define the organizational elements in which work will be planned and controlled.
3. Provide for the integration of the company's planning, scheduling, budgeting, work authorization and cost accumulation processes with each other, and as appropriate, the program work breakdown structure and the program organizational structure.
4. Identify the company organization or function responsible for controlling overhead (indirect costs).
5. Provide for integration of the program work breakdown structure and the program organizational structure in a manner that permits cost and schedule performance measurement by elements of either or both structures as needed.

**Planning, Scheduling, and Budgeting.**
6. Schedule the authorized work in a manner which describes the sequence of work and identifies significant task interdependencies required to meet the requirements of the program.
7. Identify physical products, milestones, technical performance goals, or other indicators that will be
used to measure progress.

8. Establish and maintain a time-phased budget baseline, at the control account level, against which program performance can be measured. Initial budgets established for performance measurement will be based on either internal management goals or the external customer negotiated target cost including estimates for authorized but undefinitized work. Budget for far-term efforts may be held in higher level accounts until an appropriate time for allocation at the control account level. On government contracts, if an over target baseline is used for performance measurement reporting purposes, prior notification must be provided to the customer.

9. Establish budgets for authorized work with identification of significant cost elements (labor, material, etc.) as needed for internal management and for control of subcontractors.

10. To the extent it is practicable to identify the authorized work in discrete work packages, establish budgets for this work in terms of dollars, hours, or other measurable units. Where the entire control account is not subdivided into work packages, identify the far term effort in larger planning packages for budget and scheduling purposes.

11. Provide that the sum of all work package budgets plus planning package budgets within a control account equals the control account budget.

12. Identify and control level of effort activity by time-phased budgets established for this purpose. Only that effort which is not measurable or for which measurement is not practicable may be classified as level of effort.

13. Establish overhead budgets for each significant organizational component of the company for expenses which will become indirect costs. Reflect in the program budgets, at the appropriate level, the amounts in overhead pools that are planned to be allocated to the program as indirect costs.


15. Provide that the program target cost goal is reconciled with the sum of all internal program budgets and management reserves.

Accounting Considerations.

16. Record direct costs in a manner consistent with the budgets in a formal system controlled by the general books of account.

17. When a work breakdown structure is used, summarize direct costs from control accounts into the work breakdown structure without allocation of a single control account to two or more work breakdown structure elements.

18. Summarize direct costs from the control accounts into the contractor's organizational elements without allocation of a single control account to two or more organizational elements.

19. Record all indirect costs which will be allocated to the project.

20. Identify unit costs, equivalent units costs, or lot costs when needed.

21. For EVMS, the material accounting system will provide for:
   a. Accurate cost accumulation and assignment of costs to control accounts in a manner consistent with the budgets using recognized, acceptable, costing techniques.
   b. Cost performance measurement at the point in time most suitable for the category of material involved, but no earlier than the time of progress payments or actual receipt of material.
   c. Full accountability of all material purchased for the project including the residual inventory.

Analysis and Management Reports.

22. At least on a monthly basis, generate the following information at the control account and other levels as necessary for management control using actual cost data from, or reconcilable with, the accounting system:
   a. Comparison of the amount of planned budget and the amount of budget earned for work accomplished. This comparison provides the schedule variance.
   b. Comparison of the amount of the budget earned and the actual (applied where appropriate) direct costs for the same work. This comparison provides the cost variance.

23. Identify, at least monthly, the significant differences between both planned and actual schedule performance and planned and actual cost performance, and provide the reasons for the variances in the detail needed by program management.

24. Identify budgeted and applied (or actual) indirect costs at the level and frequency needed by management for effective control, along with the reasons for any significant variances.

25. Summarize the data elements and associated variances through the program organization and/or work breakdown structure to support management needs and any customer reporting specified in the
project.

26. Implement managerial action taken as the result of earned value information.

27. Develop revised estimates of cost at completion based on performance to date, commitment values for material, and estimates of future conditions. Compare this information with the performance measurement baseline to identify variances at completion important to company management and any applicable customer reporting requirements including statements of funding requirements.

Revisions and Data Maintenance.

28. Incorporate authorized changes in a timely manner, recording the effects of such changes in the budgets and schedules. In the directed effort prior to negotiation of a change, base such revisions on the amount estimated and budgeted to the program organizations.

29. Reconcile current budgets to prior budgets in terms of changes to the authorized work and internal replanning in the detail needed by management for effective control.

30. Control retroactive changes to records pertaining to work performed that would change previously reported amounts for actual costs, earned value, or budgets. Adjustments should be made only for correction of errors, routine accounting adjustments, effects of customer or management directed changes, or to improve the baseline integrity and accuracy of performance measurement data.

31. Prevent revisions to the program budget except for authorized changes.

32. Document changes to the performance measurement baseline.

- 5.0 - Chapter Introduction
  - 5.1 - Identifying Possible Defective Pricing
  - 5.2 - Developing The Government Position On Price Adjustment
  - 5.3 - Completing Settlement Action

5.0 Chapter Introduction

This chapter covers the activities associated with identifying and adjusting for defective pricing: Defining Defective Pricing (FAR 52.215-10(a)). Defective pricing is any contracting action subject to the Truth in Negotiations Act (TINA) where the negotiated (other than sealed bidding procedure) contract price including profit or fee was increased by a significant amount because:

- The contractor or a subcontractor at any tier furnished to the Government cost or pricing data that were not complete, accurate, and current as certified in the contractor's Certificate of Current Cost or Pricing Data;

- A subcontractor or a prospective subcontractor at any tier furnished to the contractor cost or pricing data that were not complete, accurate, and current as certified in the contractor's Certificate of Current Cost or Pricing Data; or

- Any of the above parties furnished data of any description that were not accurate.

Defective Pricing Remedies (FAR 15.407-1, FAR 15.408, FAR 52.215-10, and FAR 52.215-11). When defective pricing occurs, the Government is entitled to a price reduction to eliminate any significant overpricing related to the defective data. That reduction must consider increases in both cost and profit or fee related to the defective data.

In addition to a price adjustment, the Government is also entitled to:

- Interest on any overpayments that resulted from the defective pricing of supplies or services accepted by the Government.

- A penalty equal to the amount of any overpayment, if the contractor knowingly submitted cost or pricing data which were incomplete, inaccurate, or not current.

The Government entitlement to these remedies is incorporated in the prime contract using one of the following clauses:

- Price Reduction for Defective Cost or Pricing Data, or

- Price Reduction for Defective Cost or Pricing Data --Modifications.

The prime contract also requires that covered subcontracts must include the substance of the appropriate clause above.
New Contract Threshold (FAR 15.403-4(a)(1)). For a new contract, the applicable cost or pricing data threshold is the threshold that is in effect on the date of agreement on price, or the date of award, whichever is later. The cost or pricing data threshold is currently 550,000. This amount is subject to review and possible adjustment starting October 1, 2000 and every five years thereafter.

Subcontract and Modification Cost or Pricing Data Threshold (FAR 52.215-13 and FAR 52.215-21). For prime contract modifications, new subcontracts at any tier, and subcontract modifications, the applicable cost or pricing data threshold is established by the prime contract.

- For most contracts, the applicable cost or pricing data threshold is the current threshold on the date of agreement on price, or the date of award, whichever is later.
- Some older contracts specify a dollar threshold that does not automatically change as the current threshold changes. However, a specific dollar threshold can be updated using a bilateral contract modification.

**TINA Cost or Pricing Data Requirements (FAR 15.403-4(a)(1)).** Unless an exception applies, the Truth in Negotiations Act (TINA), as amended, requires you to obtain cost or pricing data before accomplishing any of the following actions when the price is expected to exceed the cost or pricing data threshold:

- The award of any negotiated contract (except for undefinitized actions such as letter contracts).
- The award of a subcontract at any tier, if the contractor and each higher-tier subcontractor have been required to furnish cost or pricing data.
- The modification of any sealed bid or negotiated contract (whether or not cost or pricing data were initially required) or subcontract.

  - When calculating the amount of the contract price adjustment, consider both increases and decreases. (For example, a $150,000 modification resulting from a reduction of $350,000 and an increase of $200,000 is a pricing adjustment exceeding the current cost or pricing data threshold.)
  - This requirement does not apply when unrelated and separately priced changes for which cost or pricing data would not otherwise be required are included for administrative convenience in the same contract modification.

**Exceptions to TINA Cost or Pricing Data Requirements (FAR 15.403-1).** The same laws that establish requirements for cost or pricing data also provide for mandatory exceptions. **Never** require cost or pricing data, when an exception applies.

<table>
<thead>
<tr>
<th>Except from TINA requirements if...</th>
<th>Standard for Granting the Exception</th>
</tr>
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</table>
| The contracting officer determines that the agreed-upon price is based on adequate price competition. | A price is based on adequate price competition when one of the following situations exists:
- Two or more responsible offerors, competing independently, submit priced offers that satisfy the Government's expressed requirement and both of the following requirements are met:
  - Award will be made to the offeror whose proposal represents the best value where price is a substantial factor in the source selection; and
  - There is no finding that the price of the otherwise successful offeror is unreasonable. Any finding that the price is unreasonable must be supported by a statement of the facts and approved at a level above the contracting officer.
- There was a reasonable expectation, based on market research or other assessment, that two or more responsible offerors, competing independently, would submit priced offers that satisfy the Government's expressed requirement and both of the following requirements are met:
offers in response to the solicitation's expressed requirement, even though only one offer is received from a responsible, responsive offeror and both of the following requirements are met:

- Based on the offer received, the contracting officer can reasonably conclude that the offer was submitted with the expectation of competition, e.g., circumstances indicate that:
  - The offeror believed that at least one other offeror was capable of submitting a meaningful offer; and
  - The offeror had no reason to believe that other potential offerors did not intend to submit an offer; and
- The determination that the proposed price is based on adequate price competition and is reasonable is approved at a level above the contracting officer.
- Price analysis clearly demonstrates that the proposed price is reasonable in comparison with current or recent prices for the same or similar items adjusted to reflect changes in market conditions, economic conditions, quantities, or terms and conditions under contracts that resulted from price competition.

<table>
<thead>
<tr>
<th>The contracting officer determines that the item price is set by law or regulation.</th>
<th>Pronouncements in the form of periodic rulings, reviews, or similar actions of a governmental body, or embodied in the laws, are sufficient to demonstrate a set price.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The contracting officer determines that you are acquiring a commercial item.</td>
<td>A new contract or subcontract must be for an item that meets the FAR commercial-item definition. A contract or subcontract modification of a commercial-item contract must not change the item from a commercial item to a noncommercial item.</td>
</tr>
<tr>
<td>The head of the contracting activity waives the requirement.</td>
<td>The head of the contracting activity (HCA) (without power of delegation) waives the requirement in writing. The HCA may consider waiving the requirement if the price can be determined to be fair and reasonable without submission of cost or pricing data. Note: Consider the contractor or higher-tier subcontractor to whom the waiver relates to have been required to provide cost or pricing data. Consequently, award of any lower-tier subcontract expected to exceed the cost or pricing data threshold requires the submission of cost or pricing data unless an exception otherwise applies to the subcontract.</td>
</tr>
</tbody>
</table>

*Other Prohibitions Against Requiring Cost of Pricing Data (FAR 15.403-1(a) and FAR 15.403-2).*

**Never** require cost or pricing data for:

- Any contract or subcontract action with a price that is equal to or less than the simplified acquisition threshold. When calculating the price adjustment related to a contract modification, consider both increases and decreases, unless unrelated and separately priced changes for which cost or pricing data would not otherwise be required are included for administrative convenience in the same contract modification.

- The exercise of a contract option at the price established at contract award or initial negotiation.
• Proposals used solely for overrun funding or interim billing price adjustments.

_Cost or Pricing Data Requirements Authorized by the Head of the Contracting Activity_ (FAR 15.403-4(a)(2)).

If none of the exceptions or prohibitions described above apply, the head of the contracting activity (without power of delegation) may authorize the contracting officer to require cost or pricing data for any contract action below the cost or pricing data threshold.

• The head of the contracting activity must justify the requirement.

• Documentation must include a written finding that cost or pricing data are necessary to determine whether the price is fair and reasonable and the facts supporting that finding.

_Cost or Pricing Data_ (FAR 15.401 and FAR 15.406-2). Cost or pricing data:

• Are all facts that, as of the date of price agreement or, if applicable, another date agreed upon between the parties that is as close as practicable to the date of agreement on price, that prudent buyers and sellers would reasonably expect to affect price negotiations significantly.

• Must be certified as accurate, complete, and current in accordance with FAR 15.406-2.

• Are factual, not judgmental, and are therefore verifiable.

• Include the data that form the basis for the prospective offeror's judgment about future cost projections. The data do not indicate the accuracy of the prospective contractor's judgment.

• Are more than historical accounting data; they are all the facts that can be reasonably expected to contribute to the soundness of estimates of future costs and to the validity of determinations of costs already incurred.

• Include such factors as:
  - Vendor quotations;
  - Nonrecurring costs;
  - Information on changes in production methods and in production or purchasing volume;
  - Data supporting projections of business prospects and objectives and related operations costs;
  - Unit-cost trends such as those associated with labor efficiency;
  - Make-or-buy decisions;
  - Estimated resources to attain business goals; and
  - Information on management decisions that could have a significant bearing on costs.

_Data Submission_ (FAR 15.406-2(c), FAR 15.408, and FAR Table 15-2). FAR Table 15-2 makes a clear distinction between submitting cost or pricing data and merely making available books, records, and other documents without identification.

• The offeror's requirement to submit cost or pricing data is met when all accurate cost or pricing data reasonably available to the offeror have been submitted, either actually or by specific identification, to the contracting officer or an authorized representative (e.g., the cognizant auditor).

• As later information comes into the offeror's possession, the offeror should promptly submit it to the contracting officer in a manner that clearly shows how the information relates to the offeror's price proposal.

• The requirement for submission of cost or pricing data continues up to the time of agreement on price, or another date agreed upon between the parties involved.

• The offeror must include an index (appropriately referenced) of all the cost or pricing data and information accompanying or identified in the proposal. Any additions or revisions to the original data submission must be annotated on a supplemental index.
Judgment and Cost or Pricing Data (Texas Instruments, Inc., 87-3 BCA 20,195 and Grumman Aerospace Corp., 86-3 BCA 19,091).

Cost or pricing data are facts and do not include any contractor judgment used to estimate future costs. However, there are cases where the Boards of Contract Appeals (BCAs) have found that fact and judgment were so entwined that the judgments must be disclosed.

**Example 1:** A BCA ruled that a contractor was required to submit a computer-generated report used for estimating unit cost and forward pricing, even though the report contained both cost history and judgment. The judgment was not cost or pricing data. However, the cost history that served as the basis for that judgment was cost or pricing data. The BCA ruled that the report was not excluded from disclosure simply because it included judgment along with the cost or pricing data.

**Example 2:** A BCA ruled that a contractor was required to submit a draft cost analysis report. The contractor erroneously contended that the narrative analysis contained in the report did not constitute facts and that the bottom line contained in the report was itself meaningless if the Government was provided with the numbers required to perform the arithmetic to reach that bottom line. However, given the nature of the report, the BCA found that the narrative analysis added meaning to the raw figures and could not be said to lack factual content simply because it contained elements of judgment. Moreover, the draft status of the report did not affect its availability for disclosure to the Government, even though the contractor had an internal policy against releasing draft documents.

Situations Requiring a Certificate of Current Cost or Pricing Data (FAR 15.406-2(e)). Whenever you obtain cost or pricing data, you must obtain a Certificate of Current Cost or Pricing Data unless you find after data submission that the proposal qualifies for an exception to the submission requirement. Never require a Certificate of Current Cost or Pricing Data when a proposal qualifies for an exception.

If you determine after data submission that a proposal should be excepted from the cost or pricing data requirement, treat the data received as information other than cost or pricing data.

**Certificate Wording (FAR 15.401, FAR 15.403-4, and FAR 15.406-2(a)).** FAR prescribes the following wording for the Certificate of Current Cost or Pricing Data:

```
Certificate Of Current Cost Or Pricing Data
This is to certify that, to the best of my knowledge and belief, the cost or pricing data (as defined in section 15.401 of the Federal Acquisition Regulation (FAR) and required under FAR subsection 15.403-4) submitted, either actually or by specific identification in writing, to the contracting officer or to the contracting officer's representative in support of ________* are accurate, complete, and current as of ________**. This certification includes the cost or pricing data supporting any advance agreements and forward pricing rate agreements between the offeror and the Government that are part of the proposal.
Firm __________________________________________
Signature _________________________
________________________
Name _________________________________________
Title ___________________________________________
Date of execution*** _____________________________

* Identify the proposal, quotation, request for price adjustment, or other submission involved, giving the appropriate identifying number (e.g., RFP No.).
** Insert the day, month, and year when price negotiations were concluded and price agreement was reached or, if applicable, another date agreed upon between the parties that is as close as practicable to the date of agreement on price.
*** Insert the day, month, and year of signing, which should be as close as practicable to the date when the price negotiations were concluded and the contract price was agreed to.
```

The offeror must use the exact language in FAR 15.406-2(a). Accepting any variation from the FAR language could potentially invalidate the certificate.
For example: Suppose an offeror innocently replaced part of the last sentence "...includes the cost or pricing data supporting any advance agreements and forward pricing rate agreements between the offeror and the Government that are part of the proposal," with the following words "...includes the cost or pricing data supporting estimates of all direct labor hours and direct material costs in the proposal." If the contracting officer accepted the modified certification and labor rates or overhead rates were later found to be based on defective data, the contracting officer may have unwittingly weakened a legitimate defective pricing case.

Contractor Sweeps. Defective pricing could result, if any person in the contractor's organization knew that cost or pricing data submitted by the offeror were not accurate, complete, and current, when price negotiations were concluded and price agreement was reached or (if applicable) on another agreed-upon date. For example, defective pricing could occur if a subcontract buyer knew that a subcontractor intended to revise its proposal downward by $50,000, and failed to advise others in the prime contractor's organization.

To assure compliance with TINA requirements, many contractors have instituted programs for conducting extensive reviews of available cost or pricing data after negotiations are complete, but before submitting the Certificate of Current Cost or Pricing Data.

- These reviews are commonly known as "sweeps."
- The objective is to identify any new or revised data required to assure that all cost or pricing data are accurate, complete, and current.
- The offeror then submits the new or revised data to the Government with the Certificate of Current Cost or Pricing Data.
- In some cases, offerors have taken several months to complete a sweep for a single contract.

If a contractor requires more than 30 days to submit a Certificate of Current Cost or Pricing Data, the delay could indicate serious flaws in the contractor's estimating system. Consider the potential for such flaws as you analyze future cost proposals.

Additional Data After Agreement on Price (FAR 15.408 and FAR Table 15-2).

Whenever the contractor submits new or revised cost or pricing data after agreement on contract price but prior to contract award, you should require the contractor to provide an index of the data and a statement that explains how the data relate to the offeror's price proposal.

- Review The Data and Related Explanation. Determine if the new or revised data will have a significant impact on the negotiated price.
- Establish Your Position On The Need To Adjust Contract Price. If the data indicate that the negotiated price was increased or decreased by any significant amount because the contractor did not submit accurate, complete, and current data before price agreement, establish your position on any price changes needed before contract award. Consult with agency legal counsel to assure that your position conforms to the requirements of the law and agency policy.

For example: The DoD Inspector General (DODIG) has established the following position on the treatment of cost or pricing data identified by offerors after agreement on price but before contract award:

- Do not increase the contract price as a result of data submitted after price agreement.
- Reduce the agreed-upon price if the data indicate that the negotiated contract price was increased by any significant amount because the contractor did not submit the data before price agreement.
- Reach Agreement With The Offeror. Because you do not yet have a binding contract, the contracting officer and the contractor must negotiate, using the new or revised data submitted by the offeror.
- When Needed, Obtain An Updated Certificate Of Current Cost Or Pricing Data. If contract price changes based on the new or revised data, you must decide whether to rely on the certification submitted with the data or require a new certification. Consult with agency legal counsel to assure that your position conforms to the requirements of the law and agency policy.
If the discussions with the offeror are limited to cost or pricing data covered by the existing Certificate of Current Cost or Pricing Data, a new certificate will normally not be necessary.

If the discussions with the offeror are based on data not covered by the existing Certificate of Current Cost or Pricing Data, require the offeror to submit a new certificate. That certificate must certify that the data were accurate, complete, and current as of the close of the reopened negotiations or (if applicable) on another agreed-upon date.

- **Document Your Actions.** Whatever action you take, assure that it is clearly documented in the contract file.


Your price negotiation memorandum must indicate what cost or pricing data you relied upon when negotiating contract price. Courts and BCAs have refused to support Government allegations of defective pricing when the contractor argued successfully that the Government did not rely on the defective cost or pricing data. The strongest evidence of reliance on cost or pricing data is a clear price negotiation memorandum.

- Reliance exists when you directly or indirectly use offeror cost or pricing data to establish a contract price or a contract price negotiation objective.
  - Direct reliance occurs when you use cost or pricing data obtained directly from the offeror's proposal.
  - Indirect reliance occurs when you use audits, cost estimates, should-cost studies, technical evaluations, or any other evaluations which in turn considered the contractor's cost or pricing data.

- Reliance is not limited by what you "should have known." For example, a contractor cannot argue that a careful comparison with another proposal by the company would have revealed an error.

- Reliance is not negated by offeror price reductions or concessions made in the give-and-take of negotiations, unless the reduction or concession is specifically tied to updated cost or pricing data.

- Reliance does not exist if you knew, at the time of price agreement, that specific data provided by the contractor were not accurate, complete, and current. In fact, FAR requires you to notify the contractor if you learn prior to price agreement that the cost or pricing data are not accurate, complete, and current.

### 5.1 Identifying Possible Defective Pricing

*Indicators That Cost or Pricing Data Are Defective (DCAM 14-117).* You may uncover indicators of defective cost or pricing data during day-to-day operations or during reviews of contractor operations (e.g., technical reviews for negotiating other related contracts, purchasing system reviews, or contract performance reviews). Examples of situations that may raise your concern about possible defective pricing include:

- Incurred costs (either generally or in a particular category) seem to be running significantly less than projected.

- Operations included in the contractor's proposal are not actually performed in completing the contract.

- Direct cost items included in the proposal appear to be priced higher than they should be based on information available to the contractor (and not disclosed to the Government) at the time of contract price agreement.

- Data presented during later negotiations with the same company provide information that is significantly different from that presented in earlier negotiations.
Data collected during market research for a subsequent contract are inconsistent with the certified data.

Defective pricing is identified on related contracts.

Operating budget plans (e.g., indirect cost budgets) contain data that are different from the data in the contract proposal.

Labor-mix estimates do not include data on the actual labor mix on the same or similar contracts.

Review of other proposals indicates that the value of the contractor's inventory was erroneously computed or the latest valuation was not reflected in the contractor's proposal.

Estimating system reviews reveal deficiencies in procedures for identifying and submitting cost or pricing data.

Contractor pricing personnel or negotiators informally state that they failed to follow contractor internal pricing policy or estimating and/or purchasing manual instructions.

Technical review of contract performance indicates that quantity estimates were erroneous because the contractor did not use current product drawings or failed to read drawings correctly.

Purchasing reviews indicate that the contractor did not submit available evaluations of vendor quotations or failed to reveal changes in its evaluations.

Purchasing reviews indicate that purchase order cancellations were not disclosed to the Government.

Later technical evaluations indicate that the contractor did not disclose projected increases in business volume that would affect current and projected overhead and general and administrative expense rates.

Contract performance reviews indicate that the contractor duplicated cost estimates for the same task.

The make-or-buy plan submitted with the proposal is significantly different than the plan being used in contract performance.

New or revised production processes which will be used in contract performance were not disclosed.

Discuss Concerns with the Contractor. After contract award, investigate whenever you suspect that the data provided by the contractor or subcontractor were not accurate, complete, and current as of the close of negotiations or (if applicable) on another agreed-upon date.

To assure that you understand the situation, you may wish to contact the contractor to discuss your suspicions before contacting the cognizant auditor. During your discussions:

- Describe the data that you suspect are defective.
- Unless it would jeopardize the Government's position, describe the reasons that you suspect that the data are defective.
- Obtain the contractor's position on whether the cost or pricing data were accurate, complete, and current.

Document your suspicions and the results of your discussions with the contractor. Place a copy in the affected contract file(s).

Discuss Concerns with Auditor. If you are not satisfied with the contractor's position, you may wish to informally contact the cognizant auditor before requesting a defective pricing audit. A situation that appears suspicious may, in fact, result from using acceptable accounting and estimating practices.

Consider Defective Pricing Significance (FAR 15.407-1(b), FAR 52.215-10, FAR 52.215-11, DCAM 14-120.1, and Kaiser Aerospace & Electronics Corp., 90-1 BCA 22,489).

The FAR defective pricing clauses provide that the Government is entitled to remedies if a contract price was increased by any "significant amount," because the contractor provided cost or pricing data that were
not complete, accurate, and current. However, it does not define what amount is significant. One BCA found that the Government was entitled to a reduction of $5,000 even though that amount was only two-tenths of one percent of the contract price. The decision pointed out that the language of the Truth in Negotiations Act does not vest in a contractor the right to keep amounts obtained through supplying defective pricing data on the grounds that the amount so obtained was insignificant in relation to the overall contract price. However, substantial resources are required to identify, pursue, and settle defective pricing allegations. Accordingly, you should consider the materiality of alleged defective pricing before you decide to pursue the allegation.

There are no universal Government policy on materiality, but DCAA provides one useful guideline. In DCAA potential price adjustments of less than five percent of contract price or $50,000, whichever is less, are normally considered immaterial and not pursued unless:

- A contractor's deficient estimating practices have resulted in recurring defective pricing; or
- The potential price adjustment is due to a system deficiency which affects all contracts priced during the period.

**Request a Defective Pricing Audit (FAR 15.407-1(c)).** If you still suspect that the contract price significantly increased because of defective cost or pricing data, request an audit to evaluate the accuracy, completeness, and currency of the cost or pricing data submitted by the contractor through the close of negotiations. As part of your request, provide the following information:

- Identify the data that you suspect are defective.
- Describe, in detail, your reasons for suspecting that the data are defective.
- Provide the auditor a copy of:
  - The PNM if one was not previously provided.
  - The final proposal index of cost or pricing data provided by the contractor.
  - Any cost or pricing data provided to the contracting officer to support the contractor's pricing proposal, but not previously provided to the auditor.
  - If the auditor needs any additional information or support to complete the audit, you should provide it in a timely manner.

### 5.2 Developing The Government Position On Price Adjustment

**Requirement for Prompt Audit Resolution (FAR 15.407-1, DODD 7640.2, and OMB Circular A-50).** The first step in developing a Government position on a price reduction for defective pricing is a post-award audit. Although the FAR requires contracting officers to request a Government audit when they suspect defective pricing, most audits that identify defective pricing are undertaken as part of a systematic agency audit program or defective pricing reviews conducted by the GAO and Inspectors General. Regardless of why the audit was initiated or which organization performed the audit, Public Law and Office of Management and Budget (OMB) guidance require audit resolution within six months of the date that the audit was issued. Resolution occurs when the Government prenegotiation objective on the defective pricing is documented and approved in accordance with agency requirements.

- For GAO audits resolution requires an agency response to Congress.
- For other defective pricing audits, resolution occurs when:
  - The audit organization and agency management or contracting officials agree on the Government's prenegotiation objective, or,
  - If the parties cannot agree, when the audit follow-up official determines the matter to be resolved.

Contractor agreement is not required to achieve audit resolution. A defective pricing audit report is considered resolved when the prenegotiation objective is approved even though the contractor still has
the right to negotiate, appeal, or litigate the resolution.

*Process for Developing a Prenegotiation Position (DODD 7640.2).* Agency directives (e.g., Department of Defense Directive (DODD) 7640.2, Policy for Follow-up on Contract Audit Reports) provide detailed policy and procedural guidance for the resolution and disposition of specified audit reports. The table below delineates typical steps in a negotiated settlement of an alleged case of defective pricing [in order to achieve disposition in accordance with DoDI 7640.2]. If a negotiated settlement cannot be reached, the process can take much longer [especially if it goes into litigation].

<table>
<thead>
<tr>
<th>Step</th>
<th>Contracting Officer Action</th>
<th>Complete by Day</th>
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<tbody>
<tr>
<td>1</td>
<td>Receive audit and initiate tracking.</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Review the audit report and develop action plan.</td>
<td>10</td>
</tr>
</tbody>
</table>
| 3    | Assemble related facts:  
        - Request contractor comments and rebuttal, if any, to defective pricing allegations.  
        - Review the PNM and other documents related to cost or pricing data submission and contract negotiation.  
        - Consult with Government personnel involved in the negotiation process. | 75              |
| 4    | Review the contractor’s response:  
        - Request audit comments on the contractor’s rebuttal and any additional information uncovered during your review.  
        - Request legal comments on the audit and the contractor’s rebuttal. Include copies of all relevant documents in your request.  
        - If new information is uncovered during your review, request additional contractor comments and rebuttal, if any. | 135             |
| 5    | Develop, Document, and Obtain Approval of Prenegotiation Objective (Agency Decision) | 180             |
| 6    | Conduct settlement discussions with the contractor. | 240             |
| 7    | Complete the adjustment: (Completion of Action)  
        - Prepare the following documents:  
        - Price negotiation memorandum.  
        - Contract modification - if the contractor owes the Government money. (Make modification bilateral if agreement was reached, unilateral if agreement was not reached.) | 300             |
Review the Audit Report. Assure that the audit report:

- References the correct cost or pricing data cutoff date for receipt of updated cost or pricing data. The "as of" date is crucial, not date of certificate execution.

- Reflects the use of the contractor's latest certified cost or pricing data as reconciled with the PNM, and that the auditor considered all cost or pricing data and updated proposals.

- Clearly demonstrates a causal relationship between the cost or pricing data defect and the increase in contract price.

- Specifically references the exact cost category of the contractor's proposal deemed defective.

- Considers any prime contract special provisions that control the method of pricing contract modifications (when applicable).

- Findings are not affected by:
  - Incomplete or undefined contractor nomenclature;
  - Information outside the scope of certified cost or pricing data (e.g., judgments that had been made by contractor personnel);
  - An unclear audit scope; or
  - Unsubstantiated statements or conclusions that are not specifically supported by the audit findings.

Immediately consult your legal counsel for assistance and direction if a defective pricing case appears to involve fraud. Hold all actions involving suspected fraud in abeyance pending receipt of legal advice and any required coordination with the Department of Justice.

Request Contractor Comments (FAR 15.407-1(d), DCAM 4-303.1, DCAM 4-304.3, and DCAM 14-122). DCAA and most other Government audit organizations discuss factual matters with contractors throughout the post-award audit process. They also generally request contractor comments on a draft copy of the audit report exhibits, explanatory notes, disputed documents, and other significant audit information prior to final audit release. If the contractor refuses to provide comments on a draft report, the auditor may even ask for contracting officer assistance in obtaining a response. Generally, the contractor's responses to audit findings and the auditor's comments on those responses are included in the final audit report.

Still, you should give the contractor one final opportunity to comment on the audit findings before you develop your prenegotiation objectives. Limit the data released to that used as a basis for the prime contract price reduction.

- If there is some reason that you are unable to release the entire audit report, provide the contractor with a detailed summary of key elements.

- If the defective pricing allegations relate to subcontractor data, provide information necessary to support a prime contract price reduction available to the prime contractor. Assure that you do not disclose subcontractor trade secrets or confidential business information.

- If the contractor requests a copy of the price negotiation memorandum (PNM), most agencies authorize contracting officer release of pertinent portions. However, you should consult your agency legal counsel to determine your authority for release and any conditions required for
Establish a reasonable date for contractor response (normally 30 days). The period for response may be extended if necessary, but you should always emphasize to the contractor that a timely and complete response is essential to timely disposition of the defective pricing allegations.

Review Information Available Within Government Resources. Review the PNM and other information available within Government resources related to cost or pricing data submission and contract negotiation. Weigh the audit findings against any other information identified.

- In particular, you should consider the documentation in the PNM. The PNM should provide essential information concerning the cost or pricing data submitted by the contractor and the reliance placed on that data in contract pricing.
- You may find documents that clearly support the position that the data were defective and significantly affected the negotiated price.
- You may find other documents with information indicating that the data were not defective, such as:
  - Additional proposal updates provided by the contractor during the course of negotiations (e.g., later purchase orders, more current labor and overhead rates, or production techniques proposed by the contractor during negotiations).
  - Evidence indicating that the defective data did not have a significant effect on contract price because the contracting officer did not rely on it.
- Collect factual information and documentation from engineers, price analysts, production specialists, and others who may possess information on the preaward negotiation process that is not included in the contract file.

Review the contractor's response to identify areas of agreement and the contractor's rationale for any disagreement. If the contractor agrees with the audit findings, your task is easy. Occasionally, a contractor will even submit a check with its audit response. However, more often, the contractor will submit a rebuttal to the audit findings.
Obtain support as necessary from other members of the negotiation team. Support from the cognizant auditor and legal counsel can be particularly valuable.
Remember that the Government's right to a price adjustment is not affected by any of the following circumstances:
- The contractor or subcontractor was a sole-source supplier or otherwise was in a superior bargaining position.
- The contracting officer should have known that the cost or pricing data at issue were defective even though the contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the contracting officer.
- The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.
- The prime contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data relating to the contract.

Your review may raise additional questions concerning the contractor's position and related information that must be answered before you can begin to prepare your prenegotiation objectives. In fact, you may find it necessary to exchange questions and answers with the contractor several times before the true differences between the audit position and the contractor's position are clear. If all parties can agree on the facts, it should be much easier to dispose of the audit.

The cognizant contracting officer is responsible for determining the price adjustment, if any, due the
Government as the result of the alleged defective pricing. If your position differs from the final position of the cognizant auditor, assure that you comply with your agency and local procedures for documentation and review procedures to achieve audit resolution. If you believe that the data provided by the contractor were defective, you must determine what the price would have been if the data had not been defective. The difference is the price adjustment due the Government as a result of the defective pricing.

- **Establish A Price-Adjustment Baseline.** Your price-adjustment baseline should be the price supported by the defective cost or pricing data submitted by the offeror before the close of negotiation or another agreed-upon date. Draw information on the data submitted from the PNM and the last cost or pricing data index submitted by the contractor.
  
  - Normally, you should use the baseline calculated by the auditor and reported in the defective pricing audit. This audit should have been adjusted for any additional cost or pricing data submitted by the contractor up to the time of price agreement and any sweeps data submitted after price agreement but before contract award.
  
  - You may modify the audit baseline if you identify new data or interpret existing data in a manner other than that used by the auditor in preparing the report. Normally, you should coordinate with the auditor before adopting an adjusted baseline to identify any pitfalls associated with your approach.
  
  - BCA decisions (e.g., Sylvania Elect. Products, 70-2 BCA 8387, affirmed 202 Ct. Cl. 16,479 F.2d 1342) have accepted baselines based on the amount negotiated when the facts of the case clearly demonstrated that the specific cost element was reduced from the proposed amount to the amount negotiated. However, you should not adjust a baseline based on general across-the-board price reductions because there is no way to determine if those adjustments were related to the specific costs involved.

- **Calculate A Dollar-for-Dollar Reduction.** Normally, you should calculate the price reduction amount using the difference between the analysis baseline and a comparable price based on accurate, complete, and current data for the negotiation period.
  
  - That dollar-for-dollar reduction assumes that the *natural and probable consequence* of defective pricing is a price increase equal to the amount of the data defect plus applicable overhead and profit/fee.
  
  - The contractor may question the dollar-for-dollar reduction alleging that the defective data did not create a dollar-for-dollar change in contract price. For example, the firm could present evidence indicating that the contracting officer used a method (e.g., a pricing formula) that was not affected by the defective data. If that happens and the case goes to a BCA or Court, you:
    
    - Must provide evidence that defective data led to a price increase and the amount of that increase.

- **Consider Special Rules For Reductions Related To Unused Subcontract Quotes** *(FAR 15.407-1(f)(1)).* Special treatment is required for situations where a prime contractor uses defective subcontractor data in its pricing proposal but does not award a subcontract to the proposed subcontractor.
  
  - If the prime contractor awards the subcontract to a lower priced subcontractor, any adjustment in the prime contract price due to defective subcontract data is limited to the difference (plus applicable indirect cost and profit/fee) between the subcontract quote used for pricing the prime contract and the actual subcontract price (provided the data on which the actual subcontract price is based is not defective).
  
  - If the prime contractor performs the work in-house, any adjustment in the prime contract price due to defective subcontract data is limited to the difference (plus applicable indirect cost and profit/fee) between the subcontract quote used for pricing the prime contract and actual cost to the prime contractor.
• **Consider Offsets.** When one element of proposed cost is overstated because a firm based its proposal on defective data, another cost in the same proposal may be understated because the firm based its proposal on defective data. If a contractor claims an offset, you should request support from the cognizant auditor in evaluating that claim.

  o Allow an offset for any proposed costs that were understated because the firm based its cost proposal on defective data, up to the amount of the Government's defective pricing claim. In other words, the overall contract price must not increase because the contractor provided defective cost or pricing data.

  o Only allow an offset in an amount supported by the facts if the contractor:

    o Certifies that, to the best of the contractor's knowledge and belief, the contractor is entitled to the offset in the amount requested; and

    o Proves that the cost or pricing data were available before the date of agreement on price, but were not submitted.

  o Only allow an offset for understated cost elements in the same pricing action. The understated cost need not come from the same cost grouping (e.g., material, direct labor, or indirect cost).

  o Do not allow an offset if the:

    o Understated data were known by the contractor to be understated when the Certificate of Current Cost or Pricing Data was signed; or

    o The facts demonstrate that the price would not have increased in the amount proposed for offset even if the available data had been submitted before the date of price agreement or another agreed-upon date.

*Interest Adjustment Prenegotiation Objective* (**FAR 15.407-1(b)(7)**). In calculating the interest due:

• Determine the defective pricing amounts that have been overpaid to the contractor by the Government.

• Consider the date of each overpayment.

  o For subcontract defective pricing, use the date that payment was made by the Government to the prime contractor, based on the prime contract progress billings or deliveries, which included payments for a completed and accepted subcontract item.

  o For other defective pricing, use the date that payment was made by the Government to the prime contractor for the related completed and accepted contract items.

• Apply the underpayment interest rate(s) in effect for each quarter from the time of overpayment to the time of repayment, utilizing rate(s) prescribed by the Secretary of the Treasury. Remember that interest continues to accrue until repayment is made.

*Penalty Prenegotiation Objective* (**FAR 15.407-1(b)(7)**). The current contract clauses on price reduction for defective pricing require the contracting officer to assess a penalty for any overpayment that resulted from knowing submission of defective cost or pricing data under any Government contract. Prior to 1 October 1995, the penalty provision only applied to DoD contracts.

The contract clauses require you to set the penalty at an amount equal to the amount of the overpayment. *Obtain Objective Review and Approval* (**DODD 7640.2** and **OMB Circular A-50**). Before entering into discussions with the contractor, obtain all reviews and approvals required by FAR, agency, or contracting activity guidance. This action will normally meet the requirement for audit resolution.

Even if it is not specifically required, consider obtaining legal review before entering into discussions with the contractor on a defective pricing case.

**5.3 Completing Settlement Action**

*Process for Completing the Settlement Action.* After all the necessary reviews and approvals have been completed, you will be in a position to complete settlement action, including the following.

• Conduct settlement discussions with the contractor;
• Complete settlement documentation;
• Obtain necessary clearance reviews and approvals; and
• Distribute the appropriate documents to the parties involved.

Conduct Settlement Discussions (FAR 33.210). Conduct settlement discussions with the contractor to reach a bilateral agreement. If you believe it would benefit discussions, invite the cognizant auditor to participate in discussions.

In attempting to reach a settlement, do not:
• Make an agreement that precludes further defective pricing audit reviews on the same or other contracts.
• Make an agreement that is contingent upon settling defective pricing found in other contracts.
• Accept contractual goods or services on the same or other contracts as compensation for, or disposition of, a defective pricing case.
• Credit the amount of defective pricing in negotiating a concurrent or subsequent contract, including a follow-on contract.
• Adjust only one contract for defective pricing when the same defective pricing was cited on multiple contracts with the same contractor.
• Settle, compromise, pay, or otherwise adjust any claim involving fraud, or any claim or dispute for penalties or forfeitures prescribed by statute or regulation that another Federal agency is specifically authorized to administer, settle, or determine.

If you cannot reach agreement with the contractor, issue a contracting officer's final decision under the contract Disputes clause.

Complete Settlement Documentation (FAR 15.407-1(d) and FAR 33.211). Documentation is required, no matter how successful you are in reaching a negotiated settlement. In addition to a copy of the defective pricing audit, any comments obtained from the contractor, other documents used in preparing prenegotiation objectives, and prenegotiation objectives, assure that the contract file documentation includes, the price negotiation memorandum, a final decision (if necessary), a contract modification, and the demand for payment (if needed).

• **Defective Pricing Memorandum.** The pricing memorandum must include the following:
  o Your determination as to whether or not the submitted data were accurate, complete, and current as of the date certified and whether or not the Government relied on the data; and
  o The results of any contractual action taken.

• **Contracting Officer's Final Decision (if required).** The final decision must:
  o Describe the claim for defective pricing.
  o Reference the pertinent contract clause.
  o State the factual areas of agreement and disagreement.
  o State your decision with supporting rationale.
  o Include the paragraph at FAR 33.211(a)(4)(v) delineating the contractor's right to appeal.
  o Demand payment whenever the decision results in a finding that the contractor is indebted to the Government.

• **Price Reduction Contract Modification and Demand Letter.** If the contract price is reduced as a result of the alleged defective pricing, document the price reduction in a contract modification. If the amount due the Government exceeds the amount remaining on the contract, issue a demand letter to obtain the difference. Assure that the contract modification and any demand letter include the following information:
  o The repayment amount.
The penalty amount (if any).
- The interest amount through a specified date.
- A statement that interest will continue to accrue until the date repayment is made.

Obtain Clearance Reviews and Approvals. Before distributing documents related to the settlement, obtain any approvals required by agency or local guidance.

Distribute Documents (FAR 15.407-1(d)). Distribute the defective pricing memorandum as follows:
- Send one copy to the cognizant auditor.
- If the contract has been assigned for administration, send one copy to the ACO.
- Notify the contractor of your determination by providing the contractor a copy of the defective pricing memorandum, or by some other means.

Distribute other contractual documents as required by FAR and agency procedures.*
- 6.0 - Chapter Introduction
  - 6.1 - Issues And Factors To Consider In Making Equitable Adjustments
    - 6.1.1 - Equitable Adjustment Concepts
    - 6.1.2 - Cost Issues
    - 6.1.3 - Profit/Fee Issues
    - 6.1.4 - Proposal Analysis And Negotiation Process Issues
  - 6.2 - Pricing Contract Changes
  - 6.3 - Other Situations Requiring Adjustment
  - 6.4 - Definitizing Undefinitized Contract Actions
  - 6.5 - Special Considerations For Pricing Claims

6.0 Chapter Introduction
This chapter will examine the application of equitable adjustment and settlement concepts in a variety of situations.

6.1 Issues And Factors To Consider In Making Equitable Adjustments
This section will examine some of the major concepts and issues that you should consider in making an equitable adjustment.
- 6.1.1 - Equitable Adjustment Concepts
- 6.1.2 - Cost Issues
- 6.1.3 - Profit/Fee Issues
- 6.1.4 - Proposal Analysis And Negotiation Process Issues

Defining Equitable Adjustment. The term “equitable adjustment” appears expressly or implicitly in several places in the FAR text and several contract clauses (e.g., Changes, Government Property, and Differing Site Conditions). Unfortunately, neither the FAR text nor the contract clauses objectively define what is equitable, so we are left with subjective definitions.
- Webster's Third New International Dictionary defines “equitable” as “characterized by equity...fair to all concerned ... without prejudice, favor, or rigor entailing undue hardship...that can be sustained or made effective in a court of equity or upon principles of equity jurisprudence.”
- As suggested by the dictionary definition, the Courts and Boards of Contract Appeals (BCAs) have relied on such concepts as “fair and reasonable” and legal precedent to define “equitable adjustment.”
  - Unfortunately, there are no hard and fast rules that will always assure agreement between contractors and the Government.
There are not even any rules that will always assure success before the Courts and BCAs.

- The material presented in this chapter offers a framework for you to consider in pricing equitable adjustments.

### 6.1.1 Equitable Adjustment Concepts

**Need for Equitable Adjustments.** Equitable adjustments are necessitated by some modification of the contract effort. In general, these contract modifications can be defined in one of three ways:

- Addition of work to the contract.
- Deletion of work from the contract.
- Substitution or replacement of one item of work for another (i.e., an addition with a related deletion).

This modification may come from an overt change in Government requirements or it may come from a change in the conditions surrounding the contract (e.g., differing site conditions or late delivery of Government-furnished property).

**Certification Requirements** (DFARS 243.204-70 and 252.243-7002). The Department of Defense requires a Certification of Requests for Equitable Adjustment for any request exceeding the simplified acquisition threshold. The amount of the equitable adjustment is the aggregate sum of the dollar increase plus dollar decrease.

- The required language of the certification reads:
  "I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of my knowledge and belief."

- The instructions for completing the certification put the contractor on notice that the certification requires full disclosure of all relevant facts, including:
  - Any required cost or pricing data; and
  - Actual cost information and information to support any estimated costs, even if cost or pricing data are not required.

**Objectives in Making an Equitable Adjustment** (Condor Reliability, Inc., 90-3 BCA 23,254). Whatever the reason for the contract modification, the related equitable adjustment should be based on the difference between the reasonable cost of performing the contract without the addition, deletion, substitution or replacement, and the reasonable cost of performing with it.

In other words, the contractor should not be left in a better or worse cost or profit position on the unchanged work after the change than it was before the change.

To attain this objective, the price adjustment should include the:

- Direct cost of added work;
- Estimated direct cost of deleted work not already performed;
- Indirect cost affected by the modification; and
- Profit/fee affected by the modification.

**Approaches to Equitable Adjustment.** Over the years, Courts and BCAs have generally used one of the following four approaches to establish equitable adjustments in specific cases:

- Reasonable cost;
- Jury Verdict;
- Total cost; or
- Reasonable value.

Since the Court of Claims decision on Bruce Construction in 1963, the reasonable cost approach has generally been considered the best approach for pricing an equitable adjustment. Use it whenever accurate information is available concerning contractor costs affected by the modification. However, if contractors do not have accurate cost information, you should consider other approaches.

- Under the reasonable cost approach, the net cost of a contract modification is calculated as follows:

\[ N = A - (D - C) \]

Where:
- \( N \) = Net change in cost related to a contract modification
- \( A \) = Current estimate of the cost to complete the added work
- \( D \) = Current estimate of the cost of all deleted work
- \( C \) = Actual cost of deleted work already performed

- Consider the following points whenever you use this approach:
  - General tests of cost reasonableness.
  - Is this type of cost generally recognized as necessary in conducting business?
  - Is the cost consistent with sound business practice, law, regulation, and the principles of "arms-length" bargaining?
  - Does the contractor's action reflect a responsible attitude toward the Government, other customers, and the taxpayers at large?
  - Are the offeror's actions consistent with established practices?
  - **No presumption of incurred cost reasonableness.** If you challenge an actual cost after an initial review of the facts, the contractor has the burden to prove that the cost is reasonable. As you answer the above questions on cost reasonableness, consider the contractor's:
    - Situation at the time that the cost was incurred.
    - Unique business judgment.
    - The amount of cost incurred and the actions of the contractor in incurring those costs.
    - **Prudent effort.** Contractors may incur excess costs despite good faith efforts. Such costs are generally considered reasonable as long as they do not exceed the costs that a prudent person would have incurred under the circumstances. For example:
      - When a contractor's decision affecting contract costs does not require Government approval, you should consider the contractor's prudent effort and the facts available when the decision was made.
      - However, if the contractor's decision required Government approval and the contractor proceeded without the required approval, the resultant costs in excess of what the Government would have approved should normally be considered unreasonable.


Where costs cannot be segregated and identified for reasonable cost analysis, both the Government and the contractor must approach an equitable adjustment with fewer facts and increased reliance on judgment.

- In such cases, the Courts and the BCAs often use the Jury Verdict approach -- an approach that relies on available facts and expert opinion.
  - Experts for the contractor and the Government have an opportunity to present the
available evidence, including the opinions of qualified experts (e.g., estimators).

- Both sides have the opportunity to directly challenge the facts and judgment presented by the other side.
- Based on the information presented, the Court or BCA can reach a decision on an equitable adjustment in the same manner as a jury.

- Normally, your negotiations to arrive at an equitable adjustment will not have the formality of a courtroom or a hearing room. However, you should consider the key principles of the Jury Verdict approach in cases where the following elements are present:
  - **Clear evidence that an adjustment is appropriate.** Do not use the principles of this approach, unless the facts of the case clearly demonstrate that an equitable adjustment is appropriate.
  - **Not enough information available to use for reasonable cost approach.** Good business practice and the findings of Courts and BCAs require you to use the Reasonable Cost approach when adequate cost information is available.
  - **Lack of cost information is not unreasonable.** There are many situations where it is reasonable for a contractor to have incomplete records on costs affected by a contract modification. However, you should normally not use this approach in situations where the contractor was required to maintain adequate cost information (e.g., the contractor was required to comply with the Change Order Accounting clause).
  - **Convincing evidence of costs affected.** To use this approach, you should have convincing evidence of the nature and kinds of costs affected.
  - **Reasonable basis for judgment.** This approach uses judgment instead of the calculations of the Reasonable Cost approach, but that judgment must be based on the facts available. If the facts available do not provide a reasonable bases for adjustment, you should consider the viability of the Total Cost approach before continuing.


Under the Total Cost approach, the total cost of the change is the difference between the original contract price and the actual cost of performing the contract as changed.

- Generally, this approach is considered to be less desirable than the approaches above for two reasons:
  - Total costs can include not only the additional costs properly attributable to Government action or inaction, but also those attributable to contractor action or inaction.
  - Original contract prices are often based on unrealistically low bids/proposals.

- Consider using the key principles of the Total Cost approach in cases where the following elements are present:
  - **Clear evidence that an adjustment is appropriate.** Do not use the principles of this approach, unless the facts of the case clearly demonstrate that an equitable adjustment is appropriate.
  - **Impracticable to use another approach.** Only use this approach when it is not practicable to use the Reasonable Cost or Jury Verdict approach to calculate the equitable adjustment required. Consider use when costs cannot be allocated to specific changes and the facts available do not permit development of reasonable estimates of actual costs.
  - **Lack of cost information is not unreasonable.** Normally, you should not use this approach in situations where the contractor was required to maintain adequate cost information on the contract modification (e.g., the contractor was required to comply with
the Change Order Accounting clause).

- **Realistic base for adjustment.** Only use this approach when you can establish a realistic price for contract work without the modification.

- The basis for adjustment is normally the contract price before the modification took place.

- If the contract price before the modification was unrealistically low, do not permit the contractor to "get well" by over-pricing the contract modification.

- When the contract price before the modification was unrealistic, you may consider another basis for adjustment (e.g., the contract price adjusted for known elements of unrealistic pricing).

- **Reasonable total cost.** Only use this approach when the contractor's total cost records are accurate and the total cost appears reasonable for the effort required.

- **Contractor not responsible for added cost.** Before using this approach, you must be reasonably sure that the increased costs resulted from the modification and include only those cost increases attributable to Government action/inaction.

**Reasonable Value Approach** (Bruce Construction v. U.S., CT-CL 97 324 F2d 516). In the past, reasonable value, was frequently used to estimate the change in contract value that resulted from the contract modification. However, this method has been replaced by the reasonable cost approach since the Court of Claims decision on Bruce Construction in 1963.

- In that case, Bruce Construction claimed a $42,425.98 price increase for replacing concrete blocks in a construction project with sand blocks.

- Based on market prices, that claim appeared reasonable because the market price for sand blocks was generally higher than the price for concrete blocks in the area.

- In fact, Bruce purchased sand blocks for the price of concrete blocks.

- The Court rejected the claim -- finding that cost is the best measure of value.

**6.1.2 Cost Issues**

**Contract Clauses Control Adjustment Costs.** You can consider both the direct and indirect costs of the contract that are affected by the contract modification. However, applicable clauses may set limits on the types of cost that you can consider. Carefully read the applicable clause in your contract before you attempt to negotiate an equitable adjustment. Several of the most often used clauses will be examined in later sections of this chapter.

**Direct Impact Costs** (FAR Table 15-2 and T.C. Bateson Const. Co. v. U.S., 177 CT-CL 1094). Direct impact costs are costs that can be foreseen as the result of a contract modification and readily calculated based on the information available. Most direct costs affected by a contract modification are direct impact costs.

Consider the following points when estimating direct impact costs:

- The cost for added work not yet performed should be the current best estimate of the costs involved. Remember that an apparently minor modification (e.g., changing a single component) may have substantial related effects:

  - Other components may have to be changed for compatibility.

  - The labor hours or labor rates to install the new component may be affected.

  - Labor hours could be effected by different product requirements or the effect of the new component on the efficiency of assembly operations.

  - Rates could be affected by factors such as level of worker qualification requirements, timing of the labor effort, or overtime required to meet schedule requirements.

  - Delays in obtaining the new component may cause schedule delays which affect other costs.
Changing a single component could force a redesign to assure system compatibility (e.g., increased power requirements).

Such factors as a work sequence interruption, lack of a steady flow of work, and the unavoidable use of less-experienced labor may seriously affect a contractor's efficiency and increase costs.

Excessive overtime necessitated by additional work may affect labor efficiency. For example, the Court of Claims found that a 12-hour workday and a 6-day workweek tend to impair labor efficiency.

- The cost for added work already performed should be the reasonable actual cost of the work required.
- The cost of deleted work not yet performed should be the current best estimate of the costs required.
  - The estimate used to price the original contract may have been much higher or lower. For example, the original estimate for a component may have been $30,000 but the current estimate is $60,000. In this situation, $60,000 should be deleted from the contract cost.
  - Do not allow the contract modification to change the contractor's profitability on the unchanged contract effort.
- The cost of deleted work already performed must be retained in the contract cost. For example, the contractor already acquired components for $30,000, but the contract modification requires the contractor to use different components in the final system.
  - That cost must be retained in the total contract cost along with the cost of the replacement component.
  - The contract provision requiring the equitable adjustment will define the Government's right to prescribe the manner used to dispose of property made obsolete by a contract modification.

Unallowable Costs (FAR Part 31 and FAR 31.205-20). Costs of a type that are unallowable for other contract actions are also unallowable for contract modifications. For example, many requests for equitable adjustment include costs for interest related to financing additional work under the contract. Like other interest expense, interest related to contract modifications is unallowable.


Cumulative-impact costs are costs that are unforeseeable or costs that were not readily computable at the time of an initial equitable adjustment. They typically occur as the result of an unanticipated loss of efficiency or productivity caused by numerous contract modifications on a single major contract. As you examine a request for equitable adjustment to cover cumulative impact, consider the:

- Need For Separate Adjustment. Whenever possible, you should negotiate all adjustments for a contract modification at the same time. However, unforeseeable or uncomputable costs may be considered later.
  - A contractor cannot request a separate adjustment for cumulative-impact costs simply because it underestimated the impact of the change on other operations.
  - To request a separate adjustment for cumulative-impact costs, the contractor must show that neither side intended to consider such costs during previous equitable adjustments. For example, a contractor could assert during negotiations of an equitable adjustment that the modification or modifications have far reaching effects on efficiency that cannot be estimated at the time but must be considered after contract completion. If it is not clear that the equitable adjustment covers all costs related to the modification, the contractor might later claim the right to such an adjustment.

- Unforeseeable Effect Of Numerous Modifications. To obtain a separate adjustment for the cumulative effect of numerous modifications, the contractor must provide documented evidence
that there were numerous changes and reasonable evidence that there was an unforeseen or uncomputable effect on contract operations efficiency related to those changes.

- Cumulative impact costs were allowed in the Ingalls Shipbuilding case -- where three shipbuilding contracts were affected by several thousand change orders that occasioned a 58 percent contract price increase (from $113 to $209 million) and spawned a 4-year delay in the first incremental delivery.

- Cumulative impact costs were denied in the Dyson case (Dyson & Company, 78-2 BCA. 13,482, affirmed, 79-1 BCA 13,661)-- where cumulative impact costs presented on behalf of a mechanical subcontractor whose work had been exposed to 39 change orders that increased subcontract performance costs by roughly 19 percent ($612,454 was added to $3.3 million) and added 100 days of time extension.

**Unforeseeable Effect Of A Single Modification.** The contractor could assert that there was an unforeseeable impact from a single contract modification. For example, in the Penner case (Joseph Penner , 80-2 BCA 14,604), the contractor obtained an equitable adjustment for the delay, disruption, and ripple effects which resulted from the Government's directive to change the method of pile driving under a construction contract. In that case:

- During the installation of piling, it became apparent that the vibrations produced by the steam-activated pile-driving rig being used might damage adjacent property, and the Government directed the contractor to change to using water jetting.

- While the contractor took reasonable steps to prepare for the large amounts of water produced by the jetting procedure, the firm was overwhelmed by the actual amount of water and mud that resulted.

- As a result, the contractor was forced to make changes in the sequence of work and experienced considerable delay in its projected schedule.

- Since the contractor was not at fault for the type of jetting used or the method of work, the Government was responsible for the unanticipated consequences of the contract modification.

**Effect On Modified Contract Only.** A contractor is normally not entitled to recover cumulative impact costs for the ripple effect of Government-caused disruption of one contract on the contractor's efficiency and productivity on other Government contracts, unless there is specific contract language authorizing such damages. For example, if the component produced in Contract A is Government-furnished property for Contract B, any delay in providing the item under Contract B would be grounds for a separate equitable adjustment.

*Normal Indirect Cost Adjustment for Additions and Deletions (FAR 15.404-1(c), FAR 15.404-2(a), FAR 15.404-2(d), FAR 15.407-3, and CBC Enterprises, Inc., 24 CT-CL 187).*

In most cases, you should estimate the indirect cost effect of additions or deletions using the current estimated or actual indirect cost rates and bases for each accounting period affected by the equitable adjustment. As with direct costs, the current rates may be substantially different than those used to price the contract. As you estimate the effect of the contract change on indirect costs, consider applicable:

**Forward Pricing Rate Agreements.** A Forward Pricing Rate Agreement (FPRA) is a formal bilateral agreement that binds the contractor to propose the negotiated rates and the Government to accept them in pricing individual contract actions. Each agreement includes provisions for canceling all or a portion of the agreement if circumstances change and the rate(s) are no longer valid representations of future costs. If the contractor and the Government have negotiated a forward pricing rate agreement (FPRA), and:

- The effect of the Government action is relatively small considering the contractor's total business base, you should normally use the FPRA rates in negotiating an equitable adjustment.

- The effect of the Government action is relatively large considering the contractor's total business base, you should contact the contracting officer responsible for FPRA
negotiation, to discuss the possible need to reopen FPRA negotiations.

- **Forward Pricing Rate Recommendations.** Forward Pricing Rate Recommendations (FPRRs) are formal rate recommendations developed by the cognizant ACO for all Government buying activities.
  - Although FPRRs are only recommendations, you should not develop an independent position without first contacting the contract administration office that issued the FPRR. The contract administration office should be able to supply information supporting the reasonableness of the recommended rate.
  - Consider inviting the ACO who issued the FPRR and cognizant auditor to attend negotiations concerning indirect cost rates.

- **Audit Recommended Rates.** These are rates developed by Government audit personnel as a result of their review of the contractor's indirect cost rate proposal. The recommendation may result from the audit of the current contract proposal, a recent (within the last 12 months) contract proposal, or a separate indirect cost rate proposal. These are important recommendations, because auditors are the only members of the Government Acquisition Team who have general access to the contractor's accounting records. However, they are recommendations. The contracting officer is still responsible for evaluating contract price reasonableness.

*Unabsorbed and Extended Overhead (DCAM 12-603 and DCAM 12-803).* Indirect costs are absorbed (charged) to various cost objectives using indirect cost rates. As a contract incurs the indirect cost allocation base, indirect costs are absorbed using the appropriate indirect cost rates. When the Government stops or delays all or part of the contract effort, the actual indirect cost allocation base (e.g., hours or dollars) for the accounting period will decrease. Unless new, expanded, or rescheduled work under other contracts can replace the affected effort or the indirect cost pool can be reduced, the lower allocation base will increase the actual indirect cost rate for the period. The higher indirect cost rates will directly affect the cost of other contracts. You can provide equitable adjustment relief to cover any unabsorbed or extended overhead associated with Government delays or work stoppages, if the contractor can show that it necessarily suffered actual damage because the nature of the delay or work stoppage made it impractical to undertake the performance of other work. Methods for estimating the proper relief for unabsorbed indirect cost are presented later in the chapter.

**6.1.3 Profit/Fee Issues**

*Authority to Adjust Profit (FAR 52.242-14(b)).* Before you allow profit/fee as part of an equitable adjustment, assure that the contract permits such an allowance, either expressly or by implication. For example, the FAR Suspension of Work clause specifically excludes profit from any adjustment resulting from a suspension, delay, or interruption of work under the clause.

*Consistent Profit/Fee Rationale.* Use the same rationale to establish the profit/fee on added work that you use to establish the profit/fee on deleted work. However, depending on the nature of the work added or deleted and the risk involved, the profit rates for work added and deleted by the same modification could be different.

*Basic Contract Profit/Fee Rate (FAR 15.404-4(c)(6)).* For equitable adjustments, you may use the basic contract profit/fee rate as the prenegotiation objective for an equitable adjustment when the contract change or modification:
  - Calls for essentially the same type and mix of work as the basic contract; and
  - Is of relatively small dollar value compared to the total contract value.

*Major Adjustment Profit/Fee Rate (FAR 15.404-4).* When an equitable adjustment does not meet one of the criteria identified above, you must develop a profit/fee objective considering the FAR profit/fee factors and applicable agency guidance.

*Incurred Costs And Risk Evaluation.* When you evaluate risk as part of profit/fee analysis, consider the relationship between incurred costs and profit/fee. For example, if the negotiations are to definitize an undefinitized contract action, contractor cost risk may be reduced, because substantial costs may have already been incurred. As long as incurred costs are reasonable, they are not subject to estimating error
or any type of speculation. There is no forward pricing risk associated with these costs. In addition, the experience gained in incurring these costs may have reduced the cost risk on the remainder of the contract.

Follow your agency profit/fee analysis guidelines in evaluating the effect of incurred costs on contract risk. For example (DFARS 215.404-71-3(d)(2) and NASA 1815.404-471-3(d)(2)):

- If you are assigned to a DoD organization, you must consider any reduced risk on the portion of the contract performed before definitization and the portion that will be performed after definitization.
  - When costs have been incurred prior to definitization, generally regard contract type risk to be at the low end of the designated range.
  - If a substantial portion of the costs have been incurred prior to definitization, you may assign a value as low as zero percent to cost risk, regardless of the contract type.

- If you are assigned to NASA, your evaluation of contract risk must consider all attendant circumstances and should not be based solely on the portion of costs incurred, or percentage of work completed, before definitization.
  - Under some circumstances, you may reason that the total amount of cost risk has been effectively reduced.
  - Under other circumstances, you may reason that the contractor's cost risk is substantially unchanged.

6.1.4 Proposal Analysis And Negotiation Process Issues
Consider the steps in the following table as you evaluate contractor proposals for equitable adjustments or termination settlements (FAR 43.204(b)).

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<th>Analysis And Negotiation Process</th>
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### Dates of any pertinent Government actions or other key events during contract performance which may have an impact on the contractor's request for equitable adjustment.

3. After technical and/or audit/pricing support is received, determine if fact-finding is required to support resolution of identified issues. In determining the need for fact-finding, consider the:
   - Time delays or disruptions involved.
   - Complexity of the issues involved.
   - Technical complexity of the requirement.
   - Dollars involved.

4. Establish your negotiation objective based on the contractor's proposal and other available information. Document and coordinate your objective in accordance with agency procedures. Depending on the circumstances, your objective may be an increase, a decrease, or no change in contract price.

5. Conduct negotiations. During negotiations remind the contractor of the importance of providing current, accurate, and complete data, especially when the contractor is incurring contract costs while negotiations are in progress.

6. Use a bilateral contract modification to document agreement on an equitable adjustment.

7. If you cannot reach agreement on a fair and reasonable price, issue a unilateral change administratively changing the contract price to a figure that you can support as being fair and reasonable. Advise the contractor that it has the right to pursue a claim under the Disputes clause.

**Cost or Pricing Data Exceptions (FAR 15.403-1(c)).** NEVER require cost or pricing data if the contract or subcontract modification meets one of the following requirements:

- Price analysis clearly demonstrates that the proposed price is reasonable, based on comparison with current or recent prices for the same or similar items;
- Prices are set by law or regulation;
- A commercial-item contract modification does not change the item from a commercial item to a noncommercial item; or
- The head of the contracting activity, without power of delegation, has waived the requirement for cost or pricing data submission (in exceptional cases).

**Requirement for Cost or Pricing Data (FAR 15.403-4(a)).** If none of the above exceptions apply, you must obtain cost or pricing data before pricing a contract modification (whether or not cost or pricing data were initially required) when the price is expected to exceed the cost or pricing data threshold:

- When deciding whether cost or pricing data are required, sum the value of related increases and decreases in contract requirements. For example, a $150,000 modification resulting from a reduction of $350,000 and an increase of $200,000 is a $550,000 price adjustment when determining the need for cost or pricing data.
• Do not sum the value of unrelated and separately priced changes for which cost or pricing data would not otherwise be required. Such changes may be included in the same contract modification for administrative convenience.

**Modification Cost or Pricing Data Threshold (FAR 52.215-13 and FAR 52.215-21).** For prime contract and subcontract modifications, the applicable cost or pricing data threshold is established by the prime contract.

- For most contracts, the applicable cost or pricing data threshold is the current threshold on the date of agreement on price, or the date of award, whichever is later.
- Some older contracts specify a dollar threshold that does not automatically change as the current threshold changes. However, a specific dollar threshold can be updated using a bilateral contract modification.

**Cost or Pricing Data Below the Threshold (FAR 2.101 and FAR 15.403-4(a)(2)).** You may require cost or pricing data below the cost or pricing data threshold, but only if all three of the following requirements are met:

- The estimated value of related increases and decreases priced together exceeds the simplified acquisition threshold.
- No exception to requiring cost or pricing data applies.
- The head of the contracting activity (without power of delegation) authorizes you to require cost or pricing data.
  - The head of the contracting activity must justify the requirement for cost or pricing data.
  - File documentation must include a written finding that cost or pricing data are necessary to determine whether an offered price is fair and reasonable and the facts supporting that finding.

**Cost or Pricing Data (FAR 15.401, FAR 15.406-2, and FAR 52.215-21).** Cost or pricing data are all facts that, as of the date of price agreement or, if applicable, another date agreed upon between the parties that is as close as practicable to the date of agreement on price, prudent buyers and sellers would reasonably expect to affect price negotiations significantly. Submissions:

- As a minimum, must meet contract data requirements for modifications.
- Require certification as accurate, complete, and current in accordance with FAR 15.406-2.

**Information Other than Cost or Pricing Data (FAR 15.401, FAR 15.406-2, and FAR 15.403-3).** Information other than cost or pricing data, is any type of offeror information that is necessary to determine price reasonableness or cost/price realism, but does not require certification as accurate, complete, and current, in accordance with FAR 15.406-2. It may include pricing, sales, or cost information.

If you can establish an equitable adjustment using price information alone, you should limit offeror information requirements to price information other than cost or pricing data. For example, the contract modification replaces one catalog-priced item with a similar catalog-priced item. Normally, the equitable adjustment will be limited to the price difference between the two products. Price information other than cost or pricing data should be enough to support the adjustment.

If you need cost information other than cost or pricing data, you can use FAR Table 15-2 as a guide to assist you in developing tailored information requirements. Limit requirements to the information that you need to determine price reasonableness. Normally, you should permit the contractor to select the format that the firm will use to submit information other than cost or pricing data.

### 6.2 Pricing Contract Changes

**Contract Change Authority.** A change is any alteration within the scope of the contract that is made under the authority of the contract Changes clause. As delineated in the table below, the type of changes that can be made under the authority of the Changes clause depends in part on the type of contract involved.

<table>
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<tr>
<th>Contract Changes Under the Changes Clause</th>
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<tr>
<td>Type of Contract</td>
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| Non-Commercial Supply-Fixed-Price Contract or Cost-Reimbursement       | • Drawings, designs, or specifications when the supplies to be furnished are to be specifically manufactured for the Government in accordance with the drawings, designs, or specifications.  
  • Method of shipping or packing.  
  • Place of delivery |
| Non-Commercial Service-Fixed-Price Contract or Cost-Reimbursement       | • Description of services to be performed.  
  • Time of performance (i.e., hours of the day, days of the week, etc.).  
  • Place of performance of services. |
| Time-and-Material or Labor-Hour                                         | • Drawings, designs, or specifications  
  • Method of shipping or packing.  
  • Place of delivery  
  • Amount of Government-furnished property |
| Architect-Engineer or Other Professional Services Contracts-Fixed Price | • Services to be performed. |
| Transportation Services - Fixed Price                                   | • Specifications.  
  • Work or services.  
  • Place of origin.  
  • Place of delivery.  
  • Tonnage to be shipped.  
  • Amount of Government-furnished property. |
| Research and Development-Fixed-Price Contract or Cost-Reimbursement    | • Drawings, designs, or specifications.  
  • Place of inspection, delivery, or acceptance. |
| Construction or Dismantling, Demolition, or Removal of Improvements-    | • Specifications (including drawings and designs).  
  Fixed-Price Contract                                                 |  
  • Method or manner of performance of the work.  
  • Government-furnished property or services.  
  • Acceleration in the performance of the work. |
| Construction -Cost-Reimbursement                                       | • Plans and specifications or instructions incorporated in the contract. |
Initiation of Changes. You can implement contract changes, initiated by the Government or the contractor, under the Changes clause. For example, you can change the contract specifications because of a change in Government requirements or because of a product improvement recommended by the contractor. 

Unilateral and Bilateral Modifications (FAR 43.103, FAR 43.101, FAR 52.212-4(c), and FAR 52.243-1). In Government contracting, there are two basic types of authorized contract modifications -- unilateral and bilateral:

- **Unilateral modifications** are signed only by the contracting officer. Unilateral modifications are used to:
  - Make administrative changes.
  - Issue change orders.
  - Make changes authorized by clauses other than a changes clause (e.g., Property clause, Options clause, or Suspension of Work clause).
  - Issue termination notices.
  - The contractor is required to continue performance of the contract as changed and can request an equitable adjustment within the period prescribed in the contract.

- **Bilateral modifications** are signed by both the contractor and the contracting officer. You can use a bilateral modification to:
  - Define all aspects of the contract modification, including an equitable adjustment, at the time that the change is made;
  - Definitize a letter contract.
  - Reflect other agreements of the parties modifying the terms of the contract.

Preference for Bilateral Modifications (FAR 43.102(b)). Price contract modifications, including changes that could be issued unilaterally, before their execution if you can do so without affecting the interest of the Government. If a significant cost increase could result from the contract modification and time does not permit price negotiation, negotiate a not-to-exceed price whenever practical.

Costs to Consider (FAR 52.243-1, 52.243-2, 52.243-3, and 52.243-4). Carefully read the Changes clause in the contract before you attempt to negotiate an equitable adjustment. The Changes clauses for fixed-price supply and service contracts, cost-reimbursement supply and service contracts, time-and-materials/labor-hour contracts, and fixed-price construction contracts all include words similar to the following:

If any such change causes an increase or decrease in the cost of, or the time required for, performance of any part of the work under this contract, whether or not changed by the order, the Contracting Officer shall make an equitable adjustment....

The various Changes clauses require the contractor to assert its right to an equitable adjustment within a specific number of days. However, if the facts justify, the contracting officer may receive and act upon a request received at any time prior to final payment under the contract.

An equitable adjustment under the Changes clause can consider:

- **The Cost of Changed Work.** You can negotiate an adjustment in both the direct and indirect costs of changed work.

- **The Cost Effect on Unchanged Work.** You can negotiate an equitable adjustment for any increased costs for unchanged work incurred as a result of the change.

- **The Cost of Preparing a Request for Equitable Adjustment.** To obtain an equitable adjustment, the contractor must submit a proposal asserting its right to an adjustment. Since this proposal is required by the contract, the costs related to proposal preparation are allowable in accordance with the terms of the contract.
Costs Related To The Change Incurred Before Contractor Notice in Construction. The Changes clause for fixed-price construction contracts is unique in that it includes a provision allowing you to consider costs related to changes other than written contract modifications signed by the contracting officer.

- Other written or oral orders (including direction, instruction, interpretation, or determinations) may be considered as changes under the Changes clause provided that the contractor provides the contracting officer with a written notice stating the following:
  - The date, circumstances, and source of the order.
  - The contractor regards the order as a change order.
  - Under this clause, you can make an equitable adjustment for costs related to a change that were incurred even before the contractor provided written notice of the change. If the request for equitable adjustment is:
    - Based on defective specifications and the Government is responsible, include in the equitable adjustment any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.
    - Not based on defective specifications, do not make any adjustment for change-related costs incurred more than 20 days before the contractor provided written notice.

Costs Not to Consider (FAR 31.201-2, FAR 31.205-47(h)(1), FAR 52.243-1, FAR 52.243-2, FAR 52.243-3, and FAR 52.243-4). Never consider the following types of cost when making an equitable adjustment:

- **Affected Costs On Other Contracts.** A contract modification may affect the costs of performing other contracts. For example modifying a production operation could eliminate labor-hour improvement anticipated when a related contract was priced. Do not consider an equitable adjustment for cost increases or decreases for other contracts, unless there is specific contract language authorizing such adjustment.

- **Costs Of Changes Made By Persons Other Than The Contracting Officer.** Except for construction (see above), the Changes clauses do not provide for equitable adjustments based on changes made by persons other than an authorized contracting officer.

- **Costs Of Prosecuting A Claim.** The costs of preparing an equitable adjustment are allowable, but the costs of prosecuting a claim or appeal against the Government are not. Normally, a request for an equitable adjustment becomes a claim when it is certified as a claim or the contracting officer issues a final decision and the contractor proceeds with action under the contract Disputes clause.

- **Costs That Are Otherwise Unallowable.** Costs that are generally unallowable for other contract actions under the general factors for determining cost allowability are also unallowable for contract changes.

**Profit/Fee** (FAR 52.243-1, FAR 52.243-2, FAR 52.243-3, and FAR 52.243-4). Equitable adjustments for a contract change should include profit/fee unless specifically precluded by the contract. The FAR Changes clauses do not preclude including profit/fee in an equitable adjustment. However, another contract clause may preclude including profit/fee in an adjustment.

**Change Order Accounting** (FAR 52.243-6). If the contract includes the Change Order Accounting clause, you may require change order accounting whenever the cost of a change or a series of related changes exceeds $100,000. Under change order accounting, the contractor must maintain separate accounts, by job order or other suitable accounting procedure, of all incurred segregable direct costs (less allocable credits) for work, both changed and unchanged, allocable to the change order. The contractor must maintain the accounts until the parties agree to an equitable adjustment or the matter is conclusively disposed of in accordance with the Disputes clause.

If the contract does not include the Change Order Accounting clause, assure that the contractor knows that accurate records of actual costs can be extremely valuable in pursuing any request for equitable adjustment.
Resolution and Release (FAR 43.204(c)). To avoid later controversy, ensure that the equitable adjustment addresses all elements that require adjustment as a result of the contract modification. If the modification definitizes a change order, assure that the modification includes a release similar to the following:

**Contractor's Statement Of Release**
In consideration of the modification(s) agreed to herein as complete equitable adjustment(s) for the Contractor's ______(describe)_____ "proposal(s) for adjustment," the Contractor hereby releases the Government from any and all liability under this contract for further equitable adjustments attributable to such facts and circumstances giving rise to the "proposal(s) for adjustment" (except for __________).

6.3 Other Situations Requiring Adjustment

*Other Equitable Adjustment Situations.* Contracts contain other clauses that provide for an equitable adjustment for Government action or inaction that affects contract performance. This section examines adjustments related to: Government property; suspension of work; Government delay of work; or a stop-work order.

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<th>Clauses Providing Basis for Adjustment</th>
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| Government Property (Fixed-Price Contract Contracts) FAR 52.245-1 | Required for all non-commercial-item fixed-price contracts. | • The property is not delivered to the contractor by the scheduled time.  
  • The property is received by the contractor in a condition not suitable for the intended use.  
  • The Government decreases the property provided or provides substitute property.  
  • The Government fails to repair or replace Government property for which the Government is responsible. |
| Government Property (Cost-Reimbursement Contract, Time-and-Material, or Labor-Hour Contracts) FAR 52.245-1 | Required for all cost-reimbursement, time-and-material, and labor-hour contracts. | Performance of all or any part of the contract work is, for an unreasonable time, suspended, delayed, or interrupted:  
  • By an act of the contracting officer in administration of the contract, or  
  • By the contracting officer's failure to act with the time specified in the contract, or within a reasonable time if not specified.  
  • A claim shall not be allowed for any costs incurred more than 20 days before the contractor notifies the contracting officer in writing and the claim is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption but not later than the final |
| Suspension of Work FAR 52.242-14 | Required for non-commercial-item fixed-price construction or architect-engineer contract | Performance of all or any part of the contract work is, for an unreasonable time, suspended, delayed, or interrupted:  
  • By an act of the contracting officer in administration of the contract, or  
  • By the contracting officer's failure to act with the time specified in the contract, or within a reasonable time if not specified.  
  • A claim shall not be allowed for any costs incurred more than 20 days before the contractor notifies the contracting officer in writing and the claim is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption but not later than the final |
| **Government Delay of Work**<br>FAR 52.242-17 | **Required for non-commercial-item fixed-price supply contracts. Optional for non-commercial-item fixed-price service contracts.**<br>**Performance of all or any part of the work is delayed or interrupted:**<br>• By an act of the contracting officer that is not expressly or implicitly authorized by the contract; or<br>• By the failure of the contracting officer to act within the time specified in the contract, or within a reasonable time if not specified.<br>• A claim shall not be allowed for any costs incurred more than 20 days before the contractor notifies the contracting officer in writing and the claim is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption but not later than the final payment under the contract. |<br>**Stop-Work Order**<br>FAR 52.242-15 | **Non-commercial-item fixed-price contracts for supplies, services, or research and development Required (Alt I) for cost-reimbursement contracts**<br>**The stop-work order results in an increase in the time required for, or in the contractor's cost properly allocated to, the performance of any part of the contract; and**<br>The contractor asserts its right to the adjustment within 30 days after the end of the period of work stoppage; or if the facts justify the contracting officer may receive and act on a claim any time before final payment. |

*Government Property Clause (FAR 52.245-1).* As shown in the table above, the Government property clause listed provides for an equitable adjustment when the Government fails to provide required Government-furnished property (GFP). In general, any equitable adjustment under the Government property clause must follow the same procedures outlined earlier in the chapter for pricing contract changes.

A contractor may be entitled to an equitable adjustment and guidelines affecting that adjustment:

- If Government furnished property (GFP) is received by the contractor in a condition not suitable for the intended use:
  - The contractor must notify the contracting officer, detailing the facts.
  - As directed by the contracting officer, the contractor must either repair, modify, return, or otherwise dispose of the property.
  - After completing the directed action, the contractor can submit a written request for an equitable adjustment.

- If the GFP is not delivered to the contractor by the required time, the contractor can submit a written request to the contracting officer requesting an equitable adjustment for any delay caused the contractor in performing the contract.

- If the contracting officer, decreases the GFP provided or to be provided to the contractor, or substitutes other GFP for the property to be provided by the Government, or acquired by the contractor, under the contract:
The contractor must promptly take action as directed by the contracting officer regarding the removal, shipment, or disposal of the property.

The contractor can submit a written request for an equitable adjustment based on the contracting officer's action.

- If the contracting officer withdraws authority for the contractor to use Government property provided under another contract or lease, the contractor can submit a written request for an equitable adjustment.
- If damage occurs to Government property and the risk has been assumed by the Government under the contract:
  - The contractor must repair the property as directed by the contracting officer.
  - If the contractor cannot make required repairs within the time required, the contractor must dispose of the property as directed by the contracting officer.
  - When any property for which the Government is responsible is replaced or repaired by the contractor, the contracting officer must make an appropriate equitable adjustment.

Similar Coverage Under the Suspension of Work and Government Delay of Work Clauses (FAR 52.242-14 and FAR 52.242-17).

Note from the table above that the Suspension of Work and Government Delay of Work clauses both:
- Provide for equitable adjustments as a result of similar acts or failures on the part of the contracting officer.
- Require an equitable adjustment for a performance cost (excluding profit) increase necessarily caused by the suspension, delay, or interruption.
- Preclude an equitable adjustment under the clause for any suspension, delay, or interruption:
  - To the extent that performance would have been suspended, delayed, or interrupted by any other cause, including the fault or negligence of the contractor, or
  - For which an equitable adjustment is provided for or excluded under any other term or condition of the contract.
  - For any costs incurred more than 20 days before the contractor notifies the contracting officer in writing of the act or failure involved (but this requirement shall not apply to a claim resulting from a suspension order under the Suspension of Work clause).
  - Unless the claim, in a stated amount, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

Unique Government Delay of Work Clause Coverage (FAR 42.1304(b) and FAR 52.242-17). The Government Delay of Work clause (unlike the Suspension of Work clause) does not authorize the contracting officer to order a suspension, delay, or interruption of contract work, and the FAR specifically forbids use of the clause for that purpose.

Stop-Work Order (FAR 52.242-15). The Stop-Work Order clause provides for an equitable adjustment (including profit), if:
- The contracting officer issues a stop-work order;
- The order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of the contract; and
- The contractor asserts its right to the adjustment within 30 days after the end of the period of work stoppage. However, the contracting officer may receive and act upon the claim submitted at any time before final payment under the contract.

Adjustment for Unabsorbed Indirect Cost (DCAM 12.803 and DCAM 12.804, Togo D. West, Jr., Secretary of Veterans Affairs v. All State Boiler; and All State Boiler v. Togo D. West, Jr., Secretary of Veterans Affairs; US-CT-APP-FC, 42 CCF 77,323).
Any of the clauses examined in this subsection could result in an equitable adjustment related to Government delay of contractor performance. When a delay occurs, contractors will often request an equitable adjustment for unabsorbed indirect cost.

- Consider an equitable adjustment for unabsorbed indirect cost when the contractor shows that it was required to stand by during the Government-caused delay and that it was impractical to take on additional work during that period.
  - A contractor is on standby when contract work is suspended for a period of uncertain duration and the contractor can at any time be required to return to work immediately.
  - The contractor can use any relevant information to demonstrate that it was impractical to replace the contract effort in the allocation base. To prevent recovery, the Government must either show that:
    - It was not impractical for the contractor to obtain other work to which it could re-allocate its indirect costs; or
    - The contractor’s inability to obtain other work was caused by some circumstance other than the Government-caused delay.

- Consider whether the Eichleay formula results are equitable. BCAs and Courts have generally ruled that the Eichleay formula is the acceptable method for computing unabsorbed overhead resulting from Government-caused delay.
  - The Court of Appeals for the Federal Circuit has specifically ruled that the Eichleay formula is the exclusive means for calculating unabsorbed overhead in cases arising out of construction contracts.
  - The Armed Services Board of Contract Appeals (ASBCA) has supported the application of the Eichleay formula for the recovery of unabsorbed overhead on manufacturing/supply contracts.

- If the basic Eichleay formula produces inequitable results, consider adjustments to the formula.
- If the use of the Eichleay formula is not appropriate, consider other approaches to estimating unabsorbed indirect cost.

**Eichleay Formula.** The basic Eichleay formula was originally developed to allocate home office expenses on construction contracts when there is an assumption that almost all overhead is fixed rather than variable. Under the basic Eichleay formula, the normal fixed overhead allocable to a contract is identified and expressed in terms of a daily rate. The daily rate is then multiplied by the days of delay to arrive at the total amount of unabsorbed overhead.

Using the Eichleay formula, the unabsorbed indirect cost of a delayed contract is calculated as follows:

\[
\text{Unabsorbed Indirect Cost Adjustment} = \frac{\left(\frac{A}{B}\right) \times C}{D} \times E
\]

Where:
- A = Total billings for the delayed contract between the date of delayed-contract award and the date of delayed-contract completion.
- B = Total company billings for all contracts between the date of delayed-contract award and the date of delayed-contract completion.
- C = Total fixed overhead between the date of delayed-contract award and the date of delayed-contract completion.
- D = Number of days of actual performance between the date of delayed-contract award and the date of delayed-contract completion.
- E = Number of days that performance was delayed.

**Note:** You may use estimates for A, B, C, and D above when the equitable adjustment is negotiated.
Calculation example: Assume that you are administering a contract to remodel office space at your facility. The contractor is denied access to the area for ten days because of a terrorist threat. An equitable adjustment can be calculated using the Eichleay Formula.

| A = Total billings on the remodeling contract. | $954,800 |
| B = Total billings on all contracts between award and completion of the remodeling contract. | $3,410,00 |
| C = Total fixed overhead between award and completion of the remodeling contract. | $411,431 |
| D = Number of days between award and completion of the remodeling contract, including the delay. | 180 |
| E = Number of days that performance was delayed. | 10 |

Unabsorbed Indirect Cost Adjustment = \( \left( \frac{A}{B} \right) \times \frac{C}{D} \times E \)

\[
= \left( \frac{954,800}{3,410,000} \right) \times \frac{411,431}{180} \times 10
= \frac{0.28 \times 411,431}{180} \times 10
= \frac{115,200}{180} \times 10
= 640 \times 10
= 6,400 \text{ equitable adjustment for the delay}

Inequitable Eichleay Formula Results (DCAM 12-805). Use of the Eichleay formula is based on the assumptions presented below. If the current situation does not meet these assumptions, consider use of a modified form of the formula or an alternative approach:

- Overhead costs include only fixed costs.
- The contractor cannot replace the suspended work with other work.
- There is a total work stoppage.
- The cost of the delay is the same regardless of the percentage of contract completion. (The formula will produce the same result whether the contract is 1 percent or 99 percent complete.)
- The facilities are operating at or near capacity.

Eichleay Formula Adjustments (DCAM 12-805). The following adjustments to the Eichleay formula may produce more equitable results in the situations identified. Carefully document your rationale for using any of these adjustments.

- **Eichleay Formula Adjusted for a Partial Replacement of Work.** If the contractor replaced a portion of the work involved, consider adjusting the number of delay days to compensate. For example, assume that there is a 40-day delay period and that the contractor cannot replace 75 percent of the work while 25 percent is replaced. Using the basic Eichleay method, the number of
delay days would be 40. However, you can compensate for the partial loss by only considering 30 delay days (75 percent of the 40).

- **Eichleay Formula Adjusted for a Partial Work Stoppage.** In cases of a partial work stoppage, the number of days of the stoppage may be adjusted. For example, consider a 50 percent work stoppage for 30 days. Using the basic Eichleay method, the number of days would be 30. You can adjust for the partial stoppage by only considering 15 delay days (50 percent of 30).

- **Eichleay Formula Adjusted for Less Than Capacity Operation.** If the value of total contractor billings during the contract period has been depressed from full capacity, consider adjusting the value of the billings upward to approximate what the value would have been.

*Other Methods.* If you can document why use of the Eichleay formula is not appropriate, even with adjustments, you may consider other approaches to estimating unabsorbed indirect cost.

- **Allegheny Formula** *(DCAM 12-808).* This method visualizes the impact of a delay as a time line. It involves an attempt to recreate what would have happened had the delay not occurred. The difference between the recreated indirect cost rate and the rate actually incurred is the effect on indirect cost expense caused by the Government delay. Only consider this method in situations where:
  - The contractor has the capacity to perform the delayed work simultaneously with other scheduled work.
  - The contractor did not turn down other work during the period of extended contract performance.

- **Simulation Method.** Under the simulation method:
  - Contract billings are divided by the actual days worked to determine average contract billings per day worked.
  - The daily average is then multiplied by the number of days of delay to simulate the work that would have been performed had the delay not occurred.
  - This amount is added to both contract billings and total billings, the resulting ratio is used to allocate total overhead to the contract.
  - The total amount so allocated, less the amount allocated to actual work performed, yields the cost of the delay.

- **Burden Fluctuation Method.** Do not use this method if you believe that the original contract offer may have been underestimated. Under this method:
  - The difference between the experienced rates and the rates used by the contractor in its bid/proposal is calculated, and this difference is multiplied by the value of residual labor costs.
  - The residual labor costs represent the difference between the incurred total direct labor dollars and the labor dollars incurred on the contract.
  - The result is designated as unabsorbed overhead.

- **Total Cost Method.** This method is seldom used by BCAs. In the rare cases where this method must be used, a price adjustment would represent the difference between the total cost used to estimate total contract price and the costs actually incurred in contract performance. Before considering this method require the contractor to prove that:
  - The nature of the delay/disruption makes it impossible or highly impracticable to directly determine actual delay costs with a reasonable degree of accuracy.
  - The original offer was realistic.
  - The actual incurred costs were reasonable.
  - The Government was responsible for the differences between the offered and incurred
costs.

Other Cost Considerations. Other unique costs that you will encounter in considering equitable adjustments related to suspensions, delays, or interruptions will include the following:

- **Labor stand-by cost.** During the suspension, delay, or interruption, there may have been a period of time when the contractor had to pay workers for non-productive effort.
  - To the extent the contractor could not eliminate the cost, the Government is liable.
  - If the contractor simply kept the work force standing by and did not take prudent steps to reassign work or release workers, then the Government would not be liable for the excess costs.

- **Rental equipment stand-by.** Rental equipment may be required to stand by during the suspension, delay, or interruption:
  - If the contractor has rented equipment for use on the contract, and must incur additional rental costs, the Government is liable.
  - If the contractor had the opportunity to use the equipment on another job or return it to the rental company during the period of delay, then the Government would not be liable for the excess costs.

- **Loss of efficiency.** While more abstract than the previous examples, the contractor may be entitled to compensation for increased costs due to inefficiencies resulting from the suspension, delay, or interruption. For example, the layoff and rehiring of skilled tradesmen can create inefficiencies due to different people than the original work force members being rehired and retrained. In this case, a technical evaluation and cost/price analysis must be used to determine if inefficiency exists, and what the difference is between the actual cost of performance and what the costs would have been if not for the suspension, delay, or interruption.

6.4 Definitizing Undefinitized Contract Actions

**Undefinitized Contract Action** (FAR 16.603, DFARS 217.7401, and DFARS 217.7601). An undefinitized contract action (UCA) is any contract action for which the contract terms, specifications, or price are not agreed upon before performance is begun under the action. As used here:

- The term includes:
  - Letter contracts -- written preliminary contractual instruments that authorize the contractor to begin immediately manufacturing supplies or performing services;
  - Unpriced orders under basic ordering agreements; and
  - Provisioned item orders -- an undefinitized order issued under a contract which includes the Government’s requirements for an established range and quantity of spare parts, repair parts, support equipment, and test equipment required to operate and maintain an end item for an initial period of service.

- The term does not include:
  - Unilateral changes under the contract Changes clause;
  - Administrative changes;
  - Funding modifications; or
  - Any other modifications that are within the scope and under the terms of the contract (e.g., engineering change proposals or value engineering proposals, and over and above work requests).

**Undefinitized Contract Action Use** (FAR 16.603-2(a) and DFARS 217.7403). Only consider UCA use when:

- The negotiation of a definitive contract action is not possible in sufficient time to meet Government requirements, and
The Government interest demands that the contractor be given a binding commitment so that contract performance can begin immediately.

UCAs must be as complete and definite as practicable under the particular circumstances. Definitization (DFARS 217.7401(b)). Definitization is the agreement on, or determination of, contract terms, specifications, and price, which converts an undefinitized contract action to a definitive contract. Ceiling Price (FAR 16.603-2(b) and DFARS 217.7404-2). Each UCA should include a not-to-exceed price.

- All letter contracts awarded based on price competition must include a not-to-exceed price.
- All UCAs issued by DoD activities must include a not-to-exceed price.

Definitization Schedule (FAR 16.603-2, FAR 52.216-25, and DFARS 217.7404-3(a)). Each letter contract must include a definitization schedule, including the following:
  - Dates for submission of the contractor's:
    - Price proposal;
    - Required cost or pricing data;
    - Make-or-buy plan (if required); and
    - Subcontracting plan (if required).
  - A date for the start of negotiations.
  - A target date for definitization. Establish the earliest practicable target date for definitization.
    - Unless the period is extended following agency procedures, letter contracts must be definitized no later than
    - 180 days after the date of the letter contract; or
    - Before completion of 40 percent of the work, whichever occurs first.
    - In the DoD, all UCAs must provide for definitization by the earlier of the following dates:
      - 180 days after UCA issuance (this date may be extended but may not exceed 180 days after the contractor submits a qualifying proposal), or
      - The date on which the amount of funds obligated under the contract action is equal to more than 50 percent of the not-to-exceed price.

Maximum Liability (FAR 16.603-2(d), FAR 52.216-24, and DFARS 217.7406(a)). Use the Limitation of Government Liability clause to limit Government contract liability prior to definitization. Under that clause, liability is restricted to a maximum of 50 percent of the estimated cost of the definitive contract (unless a higher maximum is approved in advance by the official that authorized the letter contract).

Provisional Billing Prices. In some cases contractors have asked the Government for billing prices for use on items delivered under UCAs. Take care to ensure that such requests are appropriate under the unique circumstance of the contract action. Further, the billing price should be set at a level where the contractor will still be motivated to negotiate within the definitization schedule and within the funding limits established in the contract action.

6.5 Special Considerations For Pricing Claims

Introduction (FAR 52.233-1). Any of the pricing actions considered in this chapter may result in a claim against the Government.

- A claim is a written demand or assertion by one of the contracting parties seeking, as a matter of right:
  - The payment of money in a sum certain;
  - The adjustment or interpretation of contract terms; or
  - Other relief arising under or relating to the contract.
- A written demand or written assertion by the contractor seeking the payment of money exceeding
$100,000 is not a claim under the Disputes clause until it is certified (see Claim Requirements below).

- A voucher, invoice, or other routine request for payment may be converted to a claim under the Contract Disputes Act, by complying with the submission and certification requirements.

**Contractor Claim Submission (FAR 33.206(a)).** A contractor claim must be made in writing and submitted to the contracting officer for written decision within six years after accrual of the claim, unless the contracting parties agreed to a shorter time period. This 6-year time period does not apply to contracts awarded prior to October 1, 1995.

**Government Claims (FAR 33.206(b)).** The contracting officer must issue a written decision on any claim initiated by the Government against the contractor within six years after accrual of the claim, unless the contracting parties agree to a shorter period. This 6-year time period does not apply to contracts awarded prior to October 1, 1995, or to a Government claim based on a contractor claim involving fraud.

**Requirement for Claim Certification.** Contractors must certify any claim:

- Exceeding $100,000. Increased costs and decreased costs must be added to determine if the dollar threshold has been met.

- Regardless of amount when using:
  - Arbitration conducted pursuant to 5 U.S.C. 575-580; or
  - Any other Alternate Dispute Resolution (ADR) technique that the agency elects to handle in accordance with the Alternate Dispute Resolution Act (ADRA)

**Certificate Execution (FAR 33.207).** The certification must:

- Read as follows:

  "I certify that the claim is made in good faith; that the supporting data are accurate complete and current to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the contractor."

- Be executed by a person duly authorized to bind the contractor with respect to the claim. That person should have knowledge of the:
  - Basis of the claim;
  - Accuracy and completeness of the support data; and
  - Claim itself.

**Defective Certification (FAR 33.207(f)).** A claim certification that does not meet the above requirements is defective. A defective certification will not deprive a Court or BCA of jurisdiction over the claim. However, the Court or BCA must require correction of a defective certification before entry of final judgment.

**Fraudulent Claims (FAR 33.209).** If the contractor is unable to support any part of a claim and there is evidence that the inability is attributable to contractor misinterpretation of fact or contractor fraud, you must refer the matter to the agency official responsible for investigating fraud.

**Contracting Officer's Authority (FAR 33.210).** As a contracting officer, you have authority, within the limits of your warrant to decide or settle all claims arising under or relating to a contract subject to the Contract Disputes Act. This authority does not extend to:

- A claim or dispute for penalties or forfeitures prescribed by statute or regulation that another Federal agency is specifically authorized to administer, settle, or determine; or

- The settlement, compromise, payment, or adjustment of any claim involving fraud.

**Contracting Officer's Decision (FAR 33.211).** When a claim cannot be resolved by mutual agreement and a decision on the claim is necessary, you must:

- Review the facts pertinent to the claim.

- Secure assistance from legal and other advisors.

- Coordinate with the contract administration office or contracting office as appropriate.
- Prepare a written decision following FAR requirements. If the decision results in a finding that the contractor is indebted to the Government, the decision must include a Demand for Payment.

- Furnish a copy of the decision to the contractor by certified mail, return receipt requested, or by other method that provides evidence of receipt.

This shall apply to decisions on claims initiated by or against the contractor.

**Interest on Contractor Claims (FAR 33.208).** The Government must pay interest on any amount found due under a contractor's claim.

- Interest must be on the amount found due and unpaid from:
  - The date the contracting officer receives the claim (properly certified, if required); or
  - The date payment otherwise would have been due, if that date is later.

- If the contractor submits a claim with a defective certification:
  - Interest must be paid from the either the date that the contracting officer initially received the claim or October 29, 1992, whichever is later.
  - If a contractor has provided a proper certificate prior to October 29, 1992, after submission of a defective certificate, interest must be paid from the date the proper certificate was received by the Government.

- Simple interest is calculated from the proper date above until the date of payment. The rate shall be the rate determined by the Secretary of the Treasury which is applicable to the period during which the contracting officer receives the claim and then at the rate applicable for each 6-month period that the claim is pending.

**Interest on Government Claims (FAR 52.232-17).** The contractor may also be required to pay interest on an amount found due under a Government claim.

- The FAR Interest clause requires interest on any contractor debt unpaid after 30 days from issuance of a demand unless the contract:
  - Specifies another due date or procedure for charging or collecting interest;
  - Is a kind excluded from the requirement to include the Interest clause;
  - The contract or its debt has been exempted from interest charges under agency procedures.

- If interest is not already applicable under the contract terms, interest in contractor debt must be made an element of any agreement entered into on deferment of collection.

Unless otherwise specified in the Interest clause, the interest charge must be at the rate established by the Secretary of the Treasury under Public Law 95-563 for the period in which the amount becomes due. The interest charge must be computed for the actual number of days involved beginning with the due date and ending on the date:

- On which the designated office receives payment from the contractor;
- Of issuance of the Government check to the contractor from which an amount otherwise payable has been withheld as a credit against the contract debt;
- On which an amount withheld and applied to the contract debt would otherwise have become payable to the contractor

The interest charge may be reduced under procedures prescribed in FAR 32.608-2 in effect on the date of the contract.

- **7.1 - Commercial-Item Contract Termination For Convenience**
- **7.2 - Commercial-Item Contract Termination For Cause**
7.0 Chapter Introduction

7.1 Commercial-Item Contract Termination For Convenience

Commercial and Simplified Acquisition Clauses (FAR 12.403, FAR 13.302-4 and FAR 52.212-4.). The FAR Contract Terms and Conditions -- Commercial Items clause includes a paragraph that permits the Government to terminate the contract for the convenience of the Government. That paragraph:

- Is 90 percent shorter than the noncommercial-item fixed-price contract clause examined later in this chapter, and
- Prescribes a settlement process that is much less complex.
- The drawback is that the Government does not receive title to materials. For instance, if the Government places a contract for a commercial item that is available from stock and the contract is terminated as a result of a bid protest, the Contractor is entitled to the full contract value and also retains the goods. The same effect occurs if the item can be readily used on another government contract, sold to another customer, or returned to a vendor for a full refund. For this reason it is recommended that the standard clause not be used. An acceptable clause is as follows:

- (52.212-4(l) Termination for the Government's convenience. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of physical completion of the work performed prior to the notice of termination (including subcontractor effort, regardless of whether title has passed plus reasonable settlement expenses the Contractor can demonstrate to the satisfaction of the Government using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. The Contractor shall not be paid for any work performed or costs incurred, which reasonably could have been avoided. The Government shall not pay for any costs which can be mitigated (i.e., returnable to vendors, common items as defined in FAR 31.205-42(a), items transferable to other work, either commercial or government, or any items for which there is a ready customer) and seller agrees to take all reasonable steps possible to mitigate such damages. In the event the costs can be mitigated to less than 5 percent of the contract value, or if the contractor does not file a proposal within 120 days of the effective date of termination, the termination shall be settled for 5 percent of the contract price of the items terminated. The final settlement shall not exceed the contract value inclusive of settlement expenses. Equitable adjustments due to partial terminations are not compensable. The government reserves the right to take title to all substantially complete items or components, which are included in the percentage of completion. The failure of a prime contractor to include an appropriate termination clause in any subcontract, or to exercise the clause rights, shall not --
  - Affect the Government's right to require the termination of the subcontract; or
  - Increase the obligation of the Government beyond what it would have been if the subcontract had contained an appropriate clause.
Before settlement partial payments on settlement proposals may be requested by a prime contractor at any time after submission of its settlement proposal. If the TCO's examination of the data indicate that the requested partial payment is proper, reasonable payments may be authorized at the discretion of the TCO.

Settlement Objective (FAR 12.403(d)). The termination clause specifically says, "The Contractor shall not be required to comply with the cost accounting standards or contract cost principles" as stated in FAR Part 31.). Negotiate a settlement that pays the contractor:

- The percentage of the contract price reflecting the percentage of work performed prior to the notice of contract termination.
- Any charges the contractor can demonstrate directly resulted from the termination. The contractor:
  - May demonstrate such charges using its standard record keeping system, and
  - Is not required to comply with cost accounting standards or the FAR contract cost principles.

No Government Audit (FAR 12.403(d)(1)(ii)). The Government does not have any right to audit the contractor's records solely because of the termination for convenience.

Termination Proposal (FAR 12.403(d)(2)). Generally, the parties should mutually agree upon the requirements for the termination proposal. The parties must balance the Government's need to obtain sufficient documentation to support payment to the contractor against the goal of having a simple and expeditious settlement.

7.2 Commercial-Item Contract Termination For Cause

Simplified Clause (FAR 12.403(c) and FAR 52.212-4(m)). The FAR Contract Terms and Conditions -- Commercial Items clause also includes a paragraph that permits the Government to terminate the contract for cause. That paragraph prescribes a settlement process that is much shorter and less complex than the noncommercial-item fixed-price contract clause.

Government Right to Terminate for Cause (FAR 52.212-4(m)). The Government may terminate a commercial-item contract, or any part thereof, for cause if the contractor:

- Defaults;
- Fails to comply with any contract terms and conditions; or
- Fails to provide the Government, upon request, with adequate assurances of future performance.

Government Rights After Termination for Cause (FAR 12.403(c)(2) and FAR 52.212-4(m)). Under the clause, the Government's rights after a termination for cause includes all remedies available to any buyer in the marketplace.

- The Government is liable to the Contractor for any amount for supplies or services accepted.
- The contractor is liable to the Government for any and all remedies provided by law. The Government's preferred remedy will be to acquire similar items from another contractor and to charge the defaulted contractor with any excess reprocurement costs together with any incidental or consequential damages incurred because of the termination.
  - Incidental damages are damages that result from a breach of contract, including all reasonable expenses incurred because of the breach, and reasonable costs incurred by the Government in an attempt to avoid further loss.
  - Consequential damages are damages that do not flow directly and immediately from the termination but rather flow from the results of the termination.

Notice of Remedies (FAR 12.403(c)(3)). As part of the termination notice, indicate which remedies the Government intends to seek or provide, and a date by which the Government will inform the contractor of the remedy.

Consult with your legal counsel before issuing the termination notice.

7.3 Noncommercial-Item Fixed-Price Contract Termination For Convenience

Pricing Objective (FAR 49.201). When pricing noncommercial-item fixed-price terminations for
convenience, your primary objective should be to negotiate a reasonable settlement by agreement. The settlement should compensate the contractor fairly for the work done and the preparations made for the terminated portions of the contract, including a reasonable allowance for profit.

- Use judgment in arriving at the amount of reasonable compensation.
- Use cost and accounting data as guides, not rigid measures of reasonable compensation.
- May use other types of data, criteria, or standards as guides to fair contractor compensation.
- Agree on the total amount to be paid the contractor. There is no requirement to agree on the particular elements of cost or profit included in the agreement.

**Key Points to Consider.** As you establish a settlement amount, consider the following key points:

- Maximum settlement amount:
- General settlement proposal requirements;
- Basis used to develop the settlement proposal (inventory, total cost, or other);
- Settlement expenses;
- Settlement for profit;
- Adjustment for loss contracts; and
- Deductions from gross settlement amount.

**Maximum Settlement Amount (FAR 52.249-2(f) and (g)).** The maximum amount of a termination settlement may not exceed the sum of:

- Total contract price as reduced by:
  - The amount of any payments previously made, and
  - The contract price of any work not terminated; plus

- Reasonable settlement costs including:
  - Accounting, legal, clerical, and other expenses reasonably necessary for preparation of termination settlement proposals and supporting data;
  - The termination and settlement of subcontracts (excluding the amounts of such settlements); and
  - Storage, transportation, and other incurred costs reasonably necessary for the preservation, protection, or disposition or the termination inventory.

**General Proposal Requirements (FAR 49.206-1 and FAR 49.602).** Subject to the provisions of the termination clause, the contractor should promptly submit a settlement proposal for the amount claimed because of the termination. Settlement proposals:

- Must be submitted within one year from the effective date of the termination, unless the period is extended by the termination contracting officer (TCO).
- May include termination charges from two or more divisions or units of the prime contractor under a single prime contract consolidated and included in a single settlement proposal.
- Must cover all cost elements including settlements with subcontractors and any proposed profit.
  - With TCO consent, proposals may be filed in successive steps covering separate portions of the contractor’s costs.
  - Each interim proposal must include all costs of a particular type, unless otherwise authorized by the TCO.
- Must be on the FAR-prescribed forms unless the forms are inadequate for the contract involved.
- Must be made in reasonable detail and supported by adequate accounting information.
o Actual, standard (appropriately adjusted), or average costs may be used in preparing settlement proposals if they are determined under generally recognized accounting principles consistently followed by the contractor.

o When actual, standard, or average costs are not reasonably available, estimated costs may be used if the TCO approves the method of arriving at the estimates.

o Never require contractor to maintain an unduly elaborate cost accounting system merely because its contracts may be terminated.

• Must include one SF 1439, Schedule of Accounting Information, per termination, unless the contractor uses a SF 1438, Settlement Proposal (Short Form).

  o Unless otherwise instructed by the TCO, the contractor may use the SF 1438 for any total proposal less than $10,000.

  o Settlements that would normally be included in a single proposal (e.g., a series of separate orders for the same item under one contract), should be consolidated whenever possible and not divided to bring them below the threshold for SF 1438 use.

Inventory Basis (FAR 49.206-2(a)). The inventory basis is the preferred basis for settling most complete and partial terminations for convenience. Under the inventory basis, the settlement proposal:

• May only propose costs allocable to the terminated portion of the contract, and the settlement proposal must separately itemize all of the following costs:
  
  o Raw materials, purchased parts, metals, work in process, finished parts, components, dies, jigs, fixtures, and tooling at purchase or manufacturing cost;
  
  o Charges such as engineering costs, initial or start-up costs, and general and administrative costs;
  
  o Costs of settlements with subcontractors;
  
  o Settlement expenses; and
  
  o Other properly allocable charges.

• Must make an allowance for profit (or adjustment for loss) to complete the gross settlement proposal.

• Must deduct all unliquidated advance and progress payments and all disposal and other credits known when the proposal is developed from the gross settlement proposal.

Total Cost Basis (FAR 49.206-2(b)). The total cost basis of settlement pricing is preferred for complete terminations of construction and lump-sum professional services contracts. For other terminations, the TCO may approve contractor use of the total cost basis, when use of the inventory basis is not practical or will unduly delay settlement.

• Consider use of the total cost basis in situations such as those where:
  
  o Production has not begun and the accumulated costs represent planning and preproduction (get ready) costs.
  
  o The contractor's accounting system cannot readily establish the unit costs for work in process and finished products.
  
  o The contract does not specify unit prices.
  
  o The termination involves complete termination of a letter contract.

• For complete terminations, the contractor must:
  
  o Itemize all costs incurred under the contract up to the effective date of the termination.
  
  o Add the costs of settlements with subcontractors and applicable settlement expenses.
  
  o Make allowance for profit (or adjustment for loss).
o Deduct the contract price for all end items which have been or are to be delivered and accepted.

o Deduct all unliquidated advance and progress payments, as well as disposal and other credits known when the proposal is submitted.

- For partial terminations, the contractor must:
  o Not submit the settlement proposal until completion of the continued portion of the contract.
  o Prepare the settlement proposal in accordance with the procedures for a complete termination except that all costs incurred to the date of completion of the continued portion of the contract must be included.

*Other Basis (FAR 49.206-2(c)).* Contractor use of any basis for termination settlement other than the inventory basis or the total cost basis must be approved in advance by the chief of the cognizant contracting activity or contract administration office.

*Settlement Profit (FAR 49.202).* Profit consideration is an integral part of the settlement process whether you are using the inventory basis or the total cost basis.

- Allow profit on preparations made and work accomplished by the contractor on the terminated portion of the contract, considering the following factors:
  o The extent and difficulty of the work done by the contractor as compared with the total work required by the contract (engineering estimates of the percentage of completion ordinarily should not be required, but if available should be considered).
  o Engineering work, production scheduling, planning, technical study and supervision, and other necessary services.
  o Efficiency of the contractor, with particular regard to:
    o Attainment of quantity and quality production.
    o Reduction of costs.
    o Economic use of materials, facilities, and manpower.
    o Disposition of termination inventory.
    o Amount and source of capital and the extent of risk assumed.
    o Inventive and developmental contributions, and cooperation with the Government and other contractors in supplying technical assistance.
    o Character of the business, including the source and nature of materials and the complexity of manufacturing techniques.
    o The rate of profit that the contractor would have earned had the contract been completed.
    o The rate of profit both parties contemplated at the time the contract was negotiated.
    o Character and difficulty of subcontracting, including selection, placement and management of subcontracts, and effort in negotiating settlements of terminated subcontracts.

- For construction contracts:
  o Allow profit on the prime contractor's settlements with construction subcontractors for actual work in place at the job site, but
  o Exclude profit on the prime contractor's settlements with construction subcontractors for materials on hand and for preparations made to complete the work.

- Do not:
  o Allow profit on settlement expenses.
Allow anticipatory profits on work not accomplished or consequential damages.

Base profit for contractor effort in settling subcontractor proposals on the dollar amount of the subcontract settlement, but you should consider the contractor's efforts when determining the overall profit rate allowed.

Allow the contractor profit for material or services that, as of the effective date of the termination, had not been delivered by a subcontractor, regardless of the completion percentage.

Inventory Basis Adjustment for Loss Contracts (FAR 49.203). If the contractor was performing the contract at a loss, the contractor should not be able to "get well" due to a termination for convenience. If the termination is being settled using the inventory basis, calculate the adjusted settlement using the following formula, less all disposal credits and unliquidated advance and progress payments:

\[ S = E + D + \left( I \times \frac{P}{C + F} \right) \]

Where:
- \( S \) = Adjusted Settlement -- still subject to the deductions described later in this section
- \( E \) = Settlement Expenses -- negotiated or determined
- \( D \) = Contract Price (as adjusted) for acceptable completed end items
- \( I \) = Remainder of the inventory basis settlement amount otherwise agreed upon or determined
- \( P \) = Contract Price
- \( C \) = Incurred Costs before contract termination
- \( F \) = Estimated Cost to complete the contract

Note: The expression \( \frac{P}{C + F} \) is referred to as the loss ratio. It is to the contractor's advantage to understate the estimate to complete, to avoid application of the loss ratio and possibly earn profit. Review the estimate carefully to ensure that it is reasonable and accurately reflects the current contract status.

For example: What would be the settlement given the following information?

- \( E \) = Settlement Expenses \$7,000
- \( D \) = Price of Items Delivered and Accepted \$50,000
- \( I \) = Remainder of Settlement \$350,000
- \( P \) = Contract Price \$700,000
- \( C \) = Costs Incurred Prior to Termination \$400,000
- \( F \) = Estimate to Complete \$450,000

\[ S = E + D + \left( I \times \frac{P}{C + F} \right) \]

\[ = 7,000 + 50,000 + \left( 350,000 \times \frac{700,000}{400,000 + 450,000} \right) \]

\[ = 7,000 + 50,000 + \left( 350,000 \times \frac{700,000}{850,000} \right) \]

\[ = 7,000 + 50,000 + (350,000 \times .82) \]

\[ = 7,000 + 50,000 + 287,000 \]

\[ = 344,000 \text{ adjusted settlement amount} \]

Total Cost Basis Adjustment for Loss Contracts (FAR 49.203(c)). If the termination is being settled using the total cost basis, calculate the adjusted settlement using the following formula, less all disposal credits, unliquidated advance and progress payments, and all other amounts previously paid under the contract:
\[ S = E + \left( T \times \frac{P}{C + F} \right) \]

Where:

\( S \) = Adjusted Settlement -- still subject to the deductions described later in this section

\( E \) = Settlement Expenses -- negotiated or determined

\( T \) = Remainder of the total cost basis settlement amount otherwise agreed upon or determined (includes price of items delivered)

\( P \) = Contract Price

\( C \) = Incurred Costs before contract termination

\( F \) = Estimated Cost to Complete the contract

For example: What would be the settlement given the following information?

\( P \) = Contract Price  $800,000

\( E \) = Settlement Expenses  $10,000

\( T \) = Remainder of Settlement  $500,000

\( C \) = Costs Incurred Prior to Termination  $500,000

\( F \) = Estimate to Complete  $450,000

\[ S = E + \left( T \times \frac{P}{C + F} \right) \]

\[ = 10,000 + \left( \frac{500,000 \times 800,000}{500,000 + 450,000} \right) \]

\[ = 10,000 + \left( \frac{500,000 \times 800,000}{950,000} \right) \]

\[ = 10,000 + (500,000 \times .84) \]

\[ = 10,000 + 420,000 \]

\[ = 430,000 \text{ adjusted settlement amount} \]

Note: Under the inventory basis for settlement, the loss ratio is only applied to the cost of the items not accepted. Under the total cost basis, it is applied to all costs incurred before termination. Therefore the ratio adjustment will have a greater effect on the adjusted settlement amount.

Deductions From Gross Settlement Amount. From the gross settlement amount payable to the contractor, you must deduct:

- The agreed price for any part of the termination inventory purchased or retained by the contractor, and the proceeds from any materials sold that have not been paid or credited to the Government;

- The fair value, of any part of the termination inventory that, before transfer of title to the Government or to a buyer, is destroyed, lost, stolen, or so damaged as to become undeliverable (normal spoilage is excepted, as is inventory for which the Government has expressly assumed the risk of loss); and

- Any other amounts as appropriate for the particular termination.

7.4 Noncommercial-Item Fixed-Price Contract Termination For Default

Government Right to Terminate for Default (FAR 49.402-1 and FAR 52.249-8). When the noncommercial-items fixed-price contract contains the Default clause, the Government has the right, subject to the notice requirements of the clause, to terminate the contract completely or partially for default if the contractor fails to:
• Make delivery of the supplies or perform the services in the time specified in the contract.
• Perform any other provision of the contract.
• Make progress and that failure endangers performance of the contract.

Key Points to Consider. When you are involved in the administration of a noncommercial-items fixed-price termination for default, consider the following key points:
• Government rights;
• Amounts due the contractor;
• Government protection from overpayment; and
• Repurchase against the contractor's account.

Government Rights (FAR 49.402-2). Under a noncommercial-item fixed-price contract termination for default:
• The Government is not liable for the contractor's costs on undelivered work.
• The Government is entitled to the repayment of advance and progress payments (if any) applicable to the terminated portion of the contract.
• The Government may elect to require the contractor to transfer title and deliver to the Government completed supplies and manufacturing materials as directed by the contracting officer.
  o Never use the Default clause as authority to acquire any complete supplies or manufacturing materials when the Government has title under some other contract clause.
  o Only acquire manufacturing materials under the Default clause for furnishing to another contractor, after considering the difficulties the new contractor may have in using the materials.
• The contractor is liable to the Government for any excess costs incurred in acquiring supplies or services similar to those required by the contract terminated for default.
• The contractor is liable to the Government for any other damages, whether or not repurchase is affected.

Amounts Due the Contractor (FAR 52.249-8(f)). Under a fixed-price termination for default, the Government:
• Must pay the contract price for completed supplies delivered and accepted.
• Must negotiate an agreement on the amount of payment for:
  o Manufacturing materials (if any) delivered to and accepted by the Government.
  o Protecting and preserving property in which the Government has an interest.
• May withhold from the amounts above any sum necessary to protect the Government against loss because of outstanding liens or claims of former lien holders.

Government Protection From Overpayment (FAR 49.402-2(d)). Protect the Government from overpayment that might result from failure to provide for the Government's potential liability to laborers and material suppliers for lien rights outstanding against the completed supplies or materials after the Government has paid the contractor for them. To accomplish this, take one or more of the following actions before paying for the supplies or materials.
• Ascertain whether payment bonds (if any) provided by the contractor are adequate to satisfy all lienors' claims or whether it is reasonable to obtain similar bonds to cover outstanding liens.
• Require the contractor to furnish appropriate statements from laborers and material suppliers disclaiming any lien rights they may have to the supplies or materials.
• Obtain appropriate agreement by the Government, the contractor, and lienors ensuring release of the Government from any potential liability to the contractor or lienors.

• Withhold from the amount due for the supplies or materials any amount that you determine is necessary to protect the Government's interest, but only if the above measures cannot be accomplished or are considered inadequate.

• Take other appropriate action considering the circumstances and the degree of contractor solvency.

Repurchase Against the Contractor's Account (FAR 49.402-6). Generally, the contracting officer will decide before issuing the default termination notice whether or not the supplies or services required by the contract will be repurchased.

• When supplies or services are still required after contract termination, repurchase the same or similar supplies of services against the contractor’s account as soon as practicable.

• Repurchase at as reasonable a price as practicable, considering the quality and delivery requirements.

• If the repurchase is for a quantity not over the undelivered quantity terminated for default, the contracting officer is authorized to use any appropriate terms and acquisition method.
  o Obtain competition to the maximum extent practicable for the repurchase.
  o Cite the Default clause as the authority.

• You may repurchase a quantity in excess of the undelivered quantity terminated for default when the excess quantity is needed:
  o Treat the entire quantity as a new acquisition.
  o The excess cost may not be charged against the defaulting contractor's account for more than the undelivered quantity terminated for default (including variations in quantity permitted by the terminated contract).

• If you repurchase at a price over the price of the supplies or services terminated, after completion and final payment of the repurchase contract, make written demand on the contractor for the total amount of the excess, giving consideration to any increases or decreases in other costs such as transportation, discounts, etc.

• If the contractor fails to make payment, follow the FAR procedures for collecting contract debts due the Government.

7.5 Cost-Reimbursement Contract Termination For Convenience

Cost Allowability. Terminations for convenience under a cost-reimbursement contract are subject to the same general rules of allowability as other contract costs.

Key Points to Consider. As you establish a settlement costs and related fee (if any), consider the following key points:

• Complete termination settlement limits;
• Complete termination cost voucher treatment;
• Complete termination settlement proposal;
• Complete termination proposal audit;
• Complete termination indirect cost;
• Complete termination final settlement;
• Partial termination settlement limits;
• Partial termination cost voucher treatment;
• Partial termination settlement proposal; and
Complete Termination Settlement Limits (FAR 49.301). Pricing actions with a cost-reimbursement contract termination for convenience, are limited to the settlement of costs and fee (if any) associated with the termination. Consult the contract clauses governing costs to determine what costs are allowable. 

Complete Termination Cost Voucher Treatment (FAR 49.302). When the contract is completely terminated, the contractor may continue submitting cost vouchers until the last day of the sixth month following the month in which the termination is effective. The contractor may elect to stop using vouchers at any time during the 6-month period.

Complete Termination Settlement Proposal (FAR 49.302 and FAR 49.303-1). The contractor must submit a final settlement proposal covering unvouchered costs and any proposed fee within one year of the effective date of the contract termination, unless the period is extended by the TCO.

- The proposal must not include costs that have been:
  - Finally disallowed by the contracting officer.
  - Previously vouchered and formally questioned by the Government but not yet resolved.

- If the contractor has vouchered all costs within the 6-month period, it may limit the settlement proposal to the related fee.

Complete Termination Proposal Audit (FAR 49.303-3). Unless the proposal is limited to fee only, refer the proposal to the cognizant auditor for review. If the proposal is limited to fee, no referral is required.

Complete Termination Indirect Cost (FAR 49.303-4). If the contract contains the clause, Allowable Cost and Payment, and it appears that waiting for final indirect costs will unduly delay final settlement, the TCO may (after obtaining information from the cognizant auditor) agree with the contractor to:

- Negotiate the amount of indirect costs for the contract period for which final indirect cost rates have not been negotiated, or to use billing rates as final rates for the period if the billing rates appear reasonable, or

- Reserve any indirect cost adjustment in the final settlement agreement, pending establishment of negotiated rates.

Complete Termination Final Settlement (FAR 49.303-5 and FAR 49.305-1). Proceed with the settlement and execution of a settlement upon receipt of the audit report (if applicable) and the contract audit closing statement covering vouchered costs.

- You may include in the final settlement agreement, all demands of the Government and proposals of the contractor under the terminated contract. However, do not allow any disallowed cost or any other cost of the same nature.

- If you and the contractor can reach an overall settlement, agreement on each element of cost is not necessary.
  - Differences may be compromised and doubtful questions settled by agreement.
  - Do not include costs that are clearly unallowable under the terms of the contract.

- Adjust fee in the manner prescribed by the contract. Generally, you should base fee on the percentage of completion of the contract or terminated portion. Consider factors such as:
  - The extent and difficulty of the work performed the contract.
  - Work performed by the contractor in stopping performance, settling terminated subcontracts, and disposition of termination inventory.
  - The contractor's adjusted fee shall not include an allowance for fee for subcontract performance included in subcontracts' settlement proposals.

Partial Termination Settlement Limits (FAR 49.304-1). In a partial termination, limit the settlement to adjustment of contract fee (if any). With contracting officer concurrence, the TCO may also reduce estimated contract cost to reflect the reduced contract effort. However, you should process the partial termination following the guidelines for a complete termination, when either of the following situations exist:
• The terminated portion is clearly severable from the balance of the contract; or
• Performance of the contract is virtually complete, performance of any continued portion is only on subsidiary items or spare parts, or performance is otherwise not substantial.

**Partial Termination Cost Voucher Treatment (FAR 49.304-3).** When the contractor's proposed partial termination settlement is limited to adjustment of fee, the contractor must continue to submit the SF 1034, Public Voucher for Purchases and Services Other than Personal, for costs that are reimbursable under the contract. Never reimburse the contractor for costs of settlements with subcontractors unless required approvals or ratifications are received.

**Partial Termination Settlement Proposal (FAR 49.304-2).** The contractor must submit a final settlement proposal covering unvouched costs and any proposed fee within one year of the effective date of the contract termination, unless the period is extended by the TCO. The contractor must:
• The proposal in the form prescribed in FAR 49.602-1 or by certified letter.
• Substantiate the amount of fee claimed.

**Partial Termination Final Settlement (FAR 49.304-1).** As described above, the final settlement is limited to a fee adjustment and a concurrence of the contracting office to a reduction in the estimated contract costs. The TCO shall adjust the fee as provided in FAR 49.304-2 and FAR 49.305 unless:
• The terminated portion is clearly severable from the balance of the contract; or
• Performance of the contract is virtually complete or performance of any continued portion is otherwise not substantial.

### 7.6 Cost-Reimbursement Contract Termination For Default

**Principles for Settlement (FAR 49.403).** Settlement of a cost-reimbursement contract terminated for default is subject to the principles for settlement of a termination for convenience, except that:
• The costs of preparing the contractor's settlement proposal are not allowable; and
• The contractor is reimbursed the allowable costs, and an appropriate reduction is made in the total fee (if any).

**No Repurchase Against the Contractor's Account (FAR 49.403(c)).** A cost-reimbursement contract does not contain any provision for Government recovery of excess repurchase costs after termination for default.

### 7.7 Equitable Adjustment For Continued Portion Of A Fixed-Price Contract

**Need for Equitable Adjustment (FAR 49.208).** After a partial termination of a fixed-price contract, the contractor may request an equitable adjustment in the price or prices of the continued portion. This is not part of the actual termination settlement. The purpose of an equitable adjustment is to provide for any increases in the unit costs of the continued portion of the contract as a result of the reduction in volume. For example, start-up costs may not have been fully amortized at the time of the termination because of a significant decrease in volume, or the average labor hours necessary to produce each unit may not have decreased as anticipated because of learning or efficiency improvements.

**Proposal for Equitable Adjustment (FAR 52.249-2(l)).** The contractor may file a request with the contracting officer for an equitable adjustment of the price(s) of the continued portion of a fixed-price contract partially terminated for the convenience of the Government. Any contractor proposal for an equitable adjustment, must be submitted within 90 days from the effective date of the partial termination unless the period is extended in writing by the contracting officer.

**Cost Adjustment.** Consider a proposed equitable adjustment related to a partial termination following the same guidelines that you would follow when considering any other equitable adjustment.

**Profit Adjustment (FAR 15.404-4).** Consider reasonable adjustments in contractor profit as part of the equitable adjustment.
• Base profit analysis on the cost effects considered in the equitable adjustment.
• Develop a profit objective considering the FAR profit factors and applicable agency guidance.

**No Settlement/Adjustment Duplication (FAR 49.208).** When the contracting officer responsible for
negotiating the equitable adjustment and executing a supplemental agreement is not the TCO, the contracting officer must ensure that no part of the equitable adjustment is included in a termination settlement made or in process. The TCO must also ensure that no portion of the costs included in an equitable adjustment is included in a termination settlement.

Timing. Although the termination settlement and the equitable adjustment, may be negotiated by separate contracting officers and require separate agreements, both negotiations should normally be completed at the same time.

Clear separation of the costs associated with the termination settlement and costs associated with the equitable adjustment may be difficult at any point of time. The different contracting officers involved may have differing opinions about which costs should be considered where. Communication between contracting officers should be ongoing to prevent inclusion of duplicate settlement costs.

- **8.1 - Evaluating Cost Realism**
- **8.2 - Considering The Uncompensated Overtime Effect On Cost Realism**
- **8.3 - Considering Cost Realism In Cost-Reimbursement Proposal Evaluation**
- **8.4 - Considering Cost Realism In Fixed-Price Proposal Evaluation**

### 8.0 Chapter Introduction

#### 8.1 Evaluating Cost Realism

*Pricing Responsibility* (*FAR 15.402(a)*, *FAR 15.405(b)*, and *FAR 16.103(a)*). When negotiating a contract price, the primary concern should be the price the Government is willing to pay to obtain the required supplies or services from a responsible contractor. The objective should be to negotiate a contract type and price (or estimated fee and cost) resulting in reasonable contractor risk and provide the contractor with the greatest incentive for efficient and economical contract performance.*

*Cost Realism Analysis* is the process of evaluating specific elements of each offeror’s proposed cost estimate to determine whether the estimated proposed cost elements are realistic for the work to be performed. It is important to determine the proposed cost elements are (labor-hours and material) realistic in order to determine the probable cost of performance as it relates to the technical approach proposed by each offeror.

*Unrealistically Low Offers* (*Buying In, FAR 3.501*). Unrealistically low offers can generally occur, because the offeror:

- **May have a Lack of Understanding of the Contract Requirements.** Government requirements may not be clearly stated or the offeror may be unfamiliar with common product terminology. If the offeror underestimates the magnitude or complexity of a proposed task, the estimated costs could be far below the probable cost of successful contract performance.

- **Did Not Properly Coordinate Proposal Preparation.** The cost proposal may not be consistent with the offeror’s technical proposal. The inconsistency may occur as the result of inadequate coordination between the team preparing the technical proposal and the team preparing the cost proposal.

- **Consciously Understated The Proposed Cost/Price.** In the face of competitive pressure, an offeror may submit an unrealistically low price in order to win a contract (i.e., use a buy-in pricing strategy).
  
  - On cost-reimbursement contracts, the contractor may expect to recoup all or most of the costs related to any cost overrun that may occur.
  - On fixed-price contracts, the contractor may hope to:
    - Increase the contract amount after award (e.g., through unnecessary or excessively priced contract modifications), or
    - Receive follow-on contracts at unrealistically high prices to recover losses on the buy-in contract.
Cost Realism Analysis (FAR 15.101, FAR 15.401, and FAR 15.404-1(d)). Cost realism analysis is the process of independently reviewing and evaluating specific elements of each offeror's proposed cost estimate to determine whether the estimated proposed cost elements:

- Are realistic for the work to be performed;
- Reflect a clear understanding of contract requirements; and
- Are consistent with the unique methods of performances and materials described in the offeror's technical proposal.

Based on the evaluation criteria stated in the solicitation, you can then use the results of your analysis in selecting the offer that provides best value to the Government.

Situations for Cost Realism Analysis (FAR 15.404-1(d)). When evaluating competitive offers for a:

- Cost-reimbursement contract, you must use cost realism analysis to determine the probable cost of performance for each offeror.
- Fixed-price incentive contract or (in exceptional cases) other fixed-price contract, you may use cost realism analysis to assess offeror responsibility and contract performance risk when:
  - New requirements may not be fully understood by competing offerors;
  - There are quality concerns; or
  - Past experience indicates that contractors proposed costs have resulted in quality or service shortfalls.


Many protests to the Comptroller General (CGEN) have challenged Government cost realism analyses. The CGEN has generally sustained the contracting officer's judgment on cost realism -- as long as that judgment is:

- Informed;
- Accurate;
- Sufficiently thorough for the acquisition situation;
- Reasonable -- not arbitrary; and
- In accordance with evaluation criteria stated in the solicitation.

Clear, complete, accurate, and validated documentation is essential, because it is the documentation that demonstrates to others the basis for your analysis. You can use clear documentation to guide your efforts to resolve offeror disagreement with the results of your analysis, before that disagreement becomes a formal protest. If you are faced with a protest, clear documentation will greatly affect your chances of success in a sustaining an award decision.

Although a low offer may indicate a lack of understanding of the requirement, or that the cost proposal does not match the cost elements in the technical proposal. It is also possible that the offeror may have a more efficient technical solution to perform the required tasks in the technical proposal. If the technical proposal is found to be realistic for the work to be performed the analyst must compare the cost proposal to the technical proposal cost elements to determine whether, for example, direct material and/or direct labor categories and labor hours match and no discrepancies exist.

Cost Realism Analysis Process. Consider the following process whenever you perform cost realism analysis:

- Assure that the solicitation states how cost realism analysis will be used in the contract award decision.
- Obtain information other than cost or pricing data needed to support cost realism analysis.
- Obtain other information necessary to support analysis.
- Obtain analysis support from other members of the Government Acquisition Team.
- Identify costs/prices that are understated for the required contract effort.
- Estimate the probable cost of contract performance (when necessary).
- Use your cost realism analysis in offer evaluation.

**Award Criteria and Cost Realism Analysis** *(FAR 9.103(c), FAR 9.104-1, FAR 15.101-1, FAR 15.101-2, FAR 15.206, FAR 15.404-1(d), and DCAM 9-311.4a).* If you plan to consider cost realism in evaluating offers for contract award, your solicitation must define how it will be considered. Normally, you should make this decision during acquisition planning. However, you may decide that cost realism analysis is necessary after evaluating the offers received. At that point, you may issue an amendment revising offer evaluation criteria for contract award and requiring each offeror to submit the information required for analysis.

However, remember that changing award criteria after receipt of proposals is likely to raise questions about the fairness of the proposal evaluation process.

- For cost-reimbursement contracts, you:
  - Must use the probable cost of contract performance developed in cost realism analysis to determine best value. An award based on an unreasonably low cost proposal would be false economy, because the final price paid by the Government will depend on final contract cost.
  - May also use cost realism analysis as a factor in evaluating the offeror's understanding of contract technical requirements and the risk associated with the offeror's technical proposal.

- For fixed-price contracts, you must not adjust offered prices as a result of your analysis. However, you may use cost realism analysis in assessing:
  - Contract performance risk. An unrealistic price will normally increase the risk of successful contract completion. Evaluators should consider this increased level of risk when assessing best value.
  - Offeror responsibility. An unrealistic price:
    - Will put additional pressure on the offeror's financial resources available to support contract performance.
    - May indicate that an offeror cannot comply with the required or proposed schedule for contract performance.
    - May indicate that an offeror does not have the organization, experience, and technical skills needed to perform the contract.

**Obtain Necessary Information Other Than Cost or Pricing Data** *(FAR 15.403-5).* Once you decide to use cost realism analysis, you must decide what information other than cost or pricing data you will need to complete your analysis. In particular, you must decide what information to require from offerors. Normally, you should make this decision during acquisition planning and identify necessary cost information requirements in the solicitation. You may establish the requirement after receipt of offers, but the acquisition will be delayed while offerors gather and submit the information required.

The solicitation requirement for information other than cost or pricing data:
- Should be limited to the data that you anticipate will be needed for cost realism analysis. For example, if you are primarily concerned about the realism of labor estimates, you may limit the information requirement to labor rate and labor hour estimates. In that situation, you need not require submission of information on material, indirect costs, or profit.
- Should permit each offeror to determine its submission format unless you need a specific format for efficient and effective analysis. For a commercial item acquisition, limit information requirements, to the maximum extent practicable, to information in the form regularly maintained by the offeror in its commercial operations.
- Should require each offeror to submit information that is sufficiently current to permit effective
cost realism analysis.

- May include specific information requirements adapted from FAR Table 15-2.

Obtain Other Information Necessary to Support Analysis (FAR 15.403-3(a), FAR 22.404, and FAR 22.1002).

You should not require offerors to provide more information than necessary. Obtain additional information from other sources to support your analysis.

- A detailed and well documented Independent Government Estimate (IGE) is a valuable tool for supporting cost realism analysis. It provides a:
  - Model to identify the offeror information required for cost realism analysis, and
  - Primary benchmark for cost realism analysis.

- Sources of market cost information include:
  - Cost estimating relationships or pricing models; or
  - Wage determinations under the Davis-Bacon Act or Service Contract Act; and
  - Published cost/price indexes.
  - Ensure the information in the IGE can be validated.

Obtain Other Information Necessary to Support Analysis (FAR 15.306(e)(2) and FAR 15.404).

- Sources of information about specific offerors include:
  - Technical evaluations of offeror proposals for similar contract requirements;
  - Audit reports on recent proposals;
  - Forward pricing rate proposals and any forward pricing rate recommendations, or current forward pricing rate agreements;
  - Contract and program histories related to the current acquisition; and
  - Results from related cost estimating system reviews.

- DO NOT use data from one offeror's proposal to question the realism of another offeror's proposal. The two proposals are based on different cost accounting systems and may be based on entirely different technical approaches.

Obtain Government Acquisition Team Support (FAR 3.104-5(a), FAR 15.207, FAR 15.306(e), and FAR 15.404-2(a)(3)).

The contracting officer is ultimately responsible for performing the cost realism analysis, but the contracting officer cannot be an expert in all the disciplines involved in proposal preparation and analysis. Support from both in-house and field members of the Government Acquisition Team can be invaluable in evaluating proposal cost realism. Communicate with team members early in the acquisition process to determine the information already available, extent of assistance required, specific areas where assistance is needed, and information necessary for an efficient and effective review. Assure that the Government personnel supporting the analysis are aware of their responsibility to safeguard sensitive contractor information. During the evaluation process, disclosure of proprietary offeror information must be governed by FAR procedures and applicable agency regulations governing the disclosure, protection, and marking of proprietary and source selection information. Government personnel must not visit any offeror or discuss the proposal with any offeror without proper approval. Only request the support needed to evaluate the offers received. As the number of personnel involved in the evaluation process increases, the chance of unauthorized disclosure of proprietary proposal information also increases.

- In-House Support. Technical specialists and others familiar with specific contract requirements, are typically the Government personnel best qualified to evaluate technical proposals. They can also raise key questions about apparent inconsistencies between offeror's technical and pricing proposals. For example, the technical proposal describes the type of work typically performed by a top scientist, but the pricing proposal is based on using journeyman engineers. Are journeyman
• **Audit Support.** Their familiarity with offeror cost accounting information, puts auditors in a unique position to question inconsistencies in proposed costs. For example, an auditor may question proposed indirect cost rates that are significantly lower than the rate projections supported by available cost data.

Before requesting an audit, contact the auditor to determine how the audit office can efficiently and effectively support the cost realism analysis. A proposal audit may not even be necessary to meet your analysis objectives. For example, you may be able to verify the realism of proposed labor rates over the telephone, based on information already available to the auditor. If an audit is necessary, only request audit support in areas where adequate analysis information not already available.

• **Field Support.** The contract administration team can include administrative contracting officers, price analysts, quality assurance personnel, engineers, plus small business and legal specialists. These specialists can use their unique understanding of offeror operations to raise questions about the proposal or help answer questions raised by in-house personnel.

Before requesting field pricing support, contact field Acquisition Team members to determine how they can efficiently and effectively support the cost realism analysis. Only request field support in areas where adequate analysis information is not already available.

**Identify Understated Costs/Prices (DCAM 9-311.4a).** Ask the following questions to determine whether proposed costs/prices are significantly understated for the required contract effort.

• Does the information other than cost or pricing data submitted by the offeror satisfy the solicitation requirements?

The information submitted must be adequate for proposal analysis. Inadequate information could indicate a lack of understanding of contract requirements or an attempt to hide weaknesses in proposal development.

• Does the offeror's cost and or price appear realistic based on a comparison with the Independent Government Estimate?

A valid and well documented Independent Government Estimate (IGE) serves as the initial benchmark against which all proposals are measured.

• Analyze any significant differences between the proposal and the IGE.

• If you believe that the IGE is complete, accurate, and therefore reasonable, require the offeror to demonstrate why its proposal is appropriate for the contract.

• If you determine that the IGE is not reasonable (e.g., a major element was omitted), you should take action to correct the estimate before completing your analysis.

• Do the proposed costs/prices reflect an accurate understanding of contract requirements?

With the assistance of other Government Acquisition Team members, determine if the proposal is consistent with the technical and other solicitation requirements. Inconsistencies need to be identified and clarified. A lack of understanding of the technical requirements can lead to severe contract over or under pricing. Further, a lack of understanding can jeopardize successful contract completion.

• Are the proposed costs/prices consistent with the various elements of the technical proposal?

The cost/price proposal should be a dollars and cents representation of the technical proposal and must be consistent with the technical proposal. Inconsistencies may be identified in any element of the offeror's cost estimate (e.g., direct labor cost, direct material cost, or indirect cost).

• **Example 1.** The offeror has submitted a proposal on a contract that is part of a complex on-going research program to develop and test a state-of-the-art analysis system. In the technical proposal, the offeror has proposed to use 10 doctoral level engineers in completing the effort over a 12-month period. Instead of the market labor rate for doctoral engineers, the offeror has proposed the market labor rate for engineering assistants. It appears impossible to hire the proposed types of engineers at that labor rate.
• **Example 2.** The offeror has proposed to integrate a top-of-the-line material handling unit into a new system being designed for the Government. However, the price proposed is 50 percent less than the lowest known sales price for the item.

• **Example 3.** The offeror has proposed to conduct a stringent test program in a special test facility located in the contractor's plant. However, the proposal does not include the overhead cost normally applied to test units using the test facility.

• How have the offeror's actual contract costs incurred on previous contracts compared with the price proposed?

Past performance can be a strong indicator of future performance. However, if records indicate historically poor cost performance, provide the offeror an opportunity to demonstrate that past problems were beyond the firm's control or that improvements have been made in the firm's cost estimating system.

• Is the contractor likely to satisfactorily meet all contract requirements at the proposed price?

Even if the proposal is internally consistent and reflects an accurate understanding of the work, the offeror may still have underestimated the cost of completing the contract. Assess the probability that the offer can complete the contract on time at the proposed price.


The probable cost is the Government's estimate of what it will cost for the offeror to complete the contract based on the Government's evaluation of the offeror's technical proposal and proposed costs.

• **Decide If A Probable Cost Estimate Is Necessary.** Depending on the solicitation award criteria and the offeror's proposal, you may or may not need to develop a probable cost estimate.

  o If you are performing a cost realism analysis of a proposal for a cost-reimbursement contract, you must develop a probable cost estimate to support your analysis of best value.

  o If you are performing a cost realism analysis of a proposal for a fixed-price contract, you may develop a probable cost estimate to assess contract performance risk or contractor responsibility. However, you may be able to analyze key areas of performance risk without a probable cost estimate.

• **Consider General Points For Probable Cost Development.** Whenever you develop a probable cost estimate, consider the following points.

  o As you collect the information required to evaluate the realism of the offeror's cost/price estimate, you are also collecting the information required to develop your own estimate of the most probable contract cost.

  o In developing your estimate, adopt the portion of the offeror's estimate that appears realistic and modify the portion of the estimate that you believe is unrealistic. For example, you may accept proposed labor hours and adjust the labor rate based on an audit recommendation. Adjustments may increase or decrease cost estimates.

  o Use relevant estimating tools and techniques.

  o As you complete your estimate, assure that you clearly document your rationale for any adjustment.

• **Assure That Assessment Is Reasonable.** The Comptroller General has repeatedly found that cost realism analysis is a judgmental process and review should be limited to assuring that the analysis is reasonable and not arbitrary.

• **Develop A Probable Cost Estimate For Each Offer.** Each probable cost estimate must consider the unique characteristics of the offeror and the technical proposal. For example, in 1993, the Comptroller General rejected a cost-plus-fixed-fee contract award decision based on probable cost, because the agency failed to consider each offeror's individualized approach and instead mechanically adjusted proposed labor hours and material costs. In that case, the Comptroller General found that:
The agency's cost analyst entered into a computer each offeror's labor hour and material cost estimate for the 100 work items in a work package. The computer was programmed to compare the offeror's proposed labor hours and material costs with the Government's labor hour and material cost estimates for each work item. The computer automatically accepted those offeror estimates that were within a predefined percentage of the Government's estimate. For all offeror estimates outside the predefined percentage range, the computer adjusted the offeror's estimate by means of a mathematical formula which approximately split the difference between the contractor estimate and the Government estimate.

Contract Decision Making. Consider the results of your cost realism analysis in offer evaluation, in accordance with the contract award criteria identified in the solicitation. Later sections of this chapter provide examples of how you can consider cost realism analysis in contract award decisions.

8.2 Considering The Uncompensated Overtime Effect On Cost Realism

Uncompensated Overtime Affects Analysis (Fair Labor Standards Act, § 213). The Fair Labor Standards Act (FLSA) establishes the national minimum wage and maximum hour requirements that apply to firms involved in interstate commerce. However, the FLSA exempts numerous labor categories in a wide range of industries from its mandatory requirements. Cost realism analyses for services acquired based on the number of labor-hours to be provided rather than the task to be performed are particularly affected by the FLSA's exemption of bona fide executive, administrative, and professional workers from wage and maximum labor-hour requirements.

- Many service companies strongly encourage or even require FLSA-exempt employees to accept "uncompensated overtime"—work in excess of an average of 40 hours per week by FLSA-exempt employees without additional compensation. Compensated personal absences (e.g., such as holidays, vacations, and sick leave) are included in the normal work-week for purposes of computing uncompensated overtime.
- Not all of the firms that encourage or require uncompensated overtime account for it in the same way.
- Other firms compensate each person working overtime with overtime pay or compensatory overtime.

These differences in use and accounting for uncompensated overtime can complicate cost realism analysis of both direct labor cost and the allocation of related indirect cost. Accordingly, the issues surrounding the analysis of uncompensated overtime are given special attention here.

Forty-Hour Accounting System. Here, the term "forty-hour accounting system" refers to a labor accounting system that only charges cost objectives for forty hours per week of each employee's time no matter how many hours the employee works. The hourly labor rate is based on one/fortieth of the employee's weekly salary. When an employee works more than 40 hours, only 40 hours of labor cost can be charged to cost objectives.

- Some forty-hour accounting systems charge labor costs only to cost objectives worked on during the first eight hours of the work-day.
- Others permit employees to select which cost objectives will be charged.

Forty-Hour Accounting System Gaming.

- Either method for distributing labor costs under a forty-hour accounting system provides the opportunity for employees or management to manipulate the allocation of labor costs and the indirect costs allocated based on labor hours or labor dollars.

For example: Suppose an employee works ten hours a day five days a week. One day the employee spends five hours working on a firm fixed-price contract and five hours working on a cost-reimbursement contract. If the employee can only charge eight hours, where should they be charged?

- **Method 1.** The firm requires employees to distribute labor costs only to cost objectives worked on during the first eight hours of the work-day. If the firm fixed-price contract were scheduled first:
The cost of five hours would be allocated to the fixed-price contract; the cost of three hours would be allocated to the cost-reimbursement contract; and the final two (uncompensated) hours would not be charged.

**Method 2.** Given the same situation, the contract charges could be manipulated by scheduling the employee to work on the cost-reimbursement contract first. Then, the cost of:

- Five hours would be allocated to the cost-reimbursement contract;
- Three hours to the fixed price contract; and
- The final two (uncompensated) hours would still not be charged.

**Method 3.** The opportunity for cost manipulation would be even greater if the employee could choose which contract to charge. In that situation, the five hours would almost certainly be charged to the cost-reimbursement contract, because that would maximize contractor income.

Full-Time Accounting (FAR 31.201-4, DCAM 6-410.4, and DCAM 6-410.5). Other contractors require their employees to charge for every hour worked. The Defense Contract Audit Agency (DCAA) and others contend that total time accounting is required for compliance with FAR 31.201-4, Determining Allocability; CAS 401, Consistency in Estimating, Accumulating, and Reporting Costs; and CAS 418, Allocation of Direct and Indirect Costs.

- The DCAA Audit Manual recognizes three acceptable methods of accounting for uncompensated overtime:

  1. Calculating a separate average labor rate for each labor period, based on the salary paid divided by the total hours worked, and distributing the salary costs to all cost objectives based on that rate.
  2. Determining the percentage of total hours worked on each cost objective during the labor period and distributing salary cost based on the percentage allocation. For example, if an employee was paid on a weekly basis and worked 20 hours on one project and 30 hours on another, 40 percent of the employee's salary would be charged to the first cost objective and 60 percent to the other.
  3. Computing an estimated hourly rate for each employee for the entire year based on the total hours the employee is expected to work during the year and distributing the salary costs using the estimated hourly rates. Any variance between the actual salary costs and the amount distributed, is charged/credited to overhead.

- The DCAA Audit Manual also recognizes that other methods of uncompensated overtime accounting may be acceptable -- subject to audit review. Examples include:

  1. Distributing the salary cost to all cost objectives based on a labor rate calculated based on an 8-hour day and 40-hour week, with the excess amount distributed to overhead.
  2. Determining a percentage allocation of hours worked on each cost objective each day and distributing the daily salary cost using the calculated percentages. However, the manual warns that the daily allocation may increase the possibility of employee or management manipulation of the allocation.

**Forward Pricing With Full-Time Accounting.** If the salary and overhead costs are always the same, how should the contractor calculate the labor and indirect cost rates for forward pricing? Most firms that use this method use average historical experience for forward pricing rate development. Solicitation Uncompensated Overtime Requirements (FAR 37.115-2 and FAR 37.115-3). Labor accounting differences can create substantial problems in the evaluation of offeror projections of the cost and quality of contract performance. For example, given the same annual salary, overhead costs, and indirect cost rates based on labor hours or labor cost, a firm basing its estimate on 50-hours week could offer a lower contract cost than a firm basing its estimate on a 40-hour week. Would the quality of product be the same? It is difficult or impossible to tell. Is a person working a 50-hour week as productive as a person working a 40-hour week? Are the employees of the contractor with the estimate based on the 40-
hour week actually working 50 hours a week?
To improve competitive proposal evaluation, solicitations for professional or technical services based on
the number of hours provided (rather than the task to be performed) must require offerors to identify
uncompensated overtime hours and the uncompensated overtime rate for direct-charge FLSA-exempt
personnel included in the prime and subcontract proposals. This includes uncompensated overtime hours
that are in indirect cost pools for personnel whose regular hours are normally charged as a direct cost.
For solicitations above the simplified acquisition threshold for such services, you must use the following
provision (FAR 52.237-10):

IDENTIFICATION OF UNCOMPENSATED OVERTIME (OCT 1997)
a. Definitions.
As used in this provision--
1. Uncompensated overtime means the hours worked without additional compensation in
   excess of an average of 40 hours per week by direct charge employees who are exempt from
   the Fair Labor Standards Act. Compensated personal absences, such as holidays, vacations,
   and sick leave, shall be included in the normal work week for purposes of computing
   uncompensated overtime hours.
2. Uncompensated overtime rate is the rate that results from multiplying the hourly rate for
   a 40-hour work week by 40, and then dividing by the proposed hours per week. For example, 45
   hour proposed on a 40-hour work week basis at $20.00 would be converted to an
   uncompensated overtime rate of $17.78 per hour. ($20 x 40 divided by 45 = $17.78)
b. For any proposed hours against which an uncompensated overtime rate is applied, the
   offeror shall identify in its proposal the hours in excess of an average of 40 hours per week, by
category at the same level of detail as compensated hours, and
   the uncompensated overtime
   rate per hour, whether at the prime or subcontract level. This includes uncompensated overtime
   hours that are in indirect cost pools for personnel whose regular hours are normally charged
direct.
c. The offeror’s accounting practices used to estimate uncompensated overtime must be
   consistent with its cost accounting practices used to accumulate and report uncompensated
   overtime hours.
d. Proposals that include unrealistically low labor rates, or which do not otherwise
demonstrate cost realism, will be considered in a risk assessment and evaluated for award in
   accordance with that assessment.
e. The offeror shall include a copy of its policy addressing uncompensated overtime with its
   proposal.

Evaluate Uncompensated Overtime Proposals. As you perform cost realism analysis, use the information
provided by the offeror to consider the risks to contract performance associated with proposed
uncompensated overtime. In particular, consider risks associated with:
• Unrealistically low rates, direct or indirect, that may result in quality or performance shortfalls.
• Unbalanced distribution of costs, direct or indirect, associated with uncompensated overtime
   accounting practices.

Solicitation Professional Employee Compensation Requirements (FAR 22.1102, FAR 22.1103, and FAR
52.222-46).
Include the FAR provision, Evaluation of Compensation for Professional Employees, in any solicitation for
a negotiated service contract expected to exceed $650,000 and when contract performance will require
meaningful numbers of professional employees.
A professional employee is any employee who is a member of a profession having a recognized status
based upon acquiring professional knowledge through prolonged study. Examples include accountancy,
actuarial computation, architecture, dentistry, engineering, law, medicine, nursing, pharmacy, the
sciences (e.g., biology, chemistry, and physics), and teaching. To be a professional employee, a person
must be a professional and must be involved essentially in the discharging of professional duties.
This provision requires offerors to submit total compensation plan setting forth proposed salaries and
fringe benefits for professional employees working on the contract. Supporting information should include
data -- such as recognized national and regional compensation studies of professional, public and private
organizations -- that were used in establishing the total compensation structure.

Evaluate Professional Employee Compensation Plans (FAR 52.222-46). The offerors compensation plan should provide valuable information for your cost realism analysis of proposed labor rates. Evaluate the plan to assure that it reflects a sound management approach and understanding of the contract requirements.

- Assess the offeror's ability to provide uninterrupted high-quality work.
- Consider the professional compensation in terms of its:
  - Impact upon recruiting and retention,
  - Cost realism, and
  - Consistency with a total plan.
- Assess whether the proposed compensation levels reflect:
  - A clear understanding of the contract effort, and
  - The capability of the proposed compensation structure to obtain and retain suitably qualified personnel.
- Evaluate the ability of offerors proposing compensation levels lower than those of predecessor contractors for the same work to maintain program continuity.

8.3 Considering Cost Realism In Cost-Reimbursement Proposal Evaluation

Cost Realism Analysis in Cost-Reimbursement Proposal Analysis (FAR 15.404-1(d)(2)).

- For cost-reimbursement contracts, you:
  - Must use the probable cost of contract performance developed in cost realism analysis to determine best value. An award based on an unreasonably low cost proposal would be false economy, because the final price paid by the Government will depend on final contract cost.
  - May also use cost realism analysis as a factor in evaluating the offeror's understanding of contract technical requirements and the risk associated with the offeror's technical proposal.

Not Limited to Downward Adjustment (DCAM 9-311.4a and EDAW, Inc., CGEN B-272884, Nov. 1, 1996). Even though the primary objective of cost realism analysis is to ensure proposed cost elements are realistic and not understated, you are not limited to making upward adjustments as you develop a probable cost estimate.

For example: In a 1996 case, EDAW, Inc. protested the award of a contract to Dames & Moore (D&M) under a request for proposal (RFP) issued by the Department of the Interior, Bureau of Reclamation (Reclamation), for the preparation of resource management plans (RMPs) in the Columbia Basin Area of Washington State.

- EDAW contended that:
  - The agency arbitrarily deleted proposed contingency labor hours and costs from D&M's proposal.
  - It was improper for the agency to eliminate D&M's contingent labor costs because under the terms of the RFP, offerors could include contingency labor costs in their proposals and D&M certified that its proposed costs for contingency hours were consistent with its cost accounting standards.
  - Without this "contrived" reduction, EDAW's proposal rather than D&M's would have had the lowest evaluated costs.
- The Comptroller General found that:
  - While EDAW was correct that the RFP allowed an offeror to propose contingency labor hours, there was nothing in the solicitation which precluded the agency from deleting these labor hours.
  - The record showed that in conducting a cost realism analysis of D&M's proposed costs,
the agency considered the extent to which D&M’s proposed costs represented a reasonable estimation of future costs.

- In the agency’s judgment, the contingency hours were not related to D&M’s ability to successfully perform the various RMP tasks. Stated differently, the agency concluded that proposed total labor hours were all that were necessary, given D&M’s technical approach to accomplishing the work.

- The agency’s position was bolstered by the fact that, even without these contingent hours, D&M’s proposal contained more labor hours than EDAW proposed.

- It did not make sense for the agency to include contingent labor hours and costs, which it believed were not necessary for contract performance, simply because D&M certified that these costs were consistent with its cost accounting standards. D&M’s certification that the costs proposed are consistent with its cost accounting standards simply was not relevant to the issue of whether the proposed contingency hours will actually be necessary for contract performance.

- The protester did not show that the deletion of the contingency hours was unreasonable.

The Comptroller General denied the protest.


Even firms with sophisticated estimating systems can submit unrealistic cost proposals. As you estimate probable cost, the difference between the probable cost and the offeror’s proposed costs may be quite large as long as the difference is supported by the facts of your analysis.

For example: In a 1993 case, Westinghouse Electric Corporation protested award of a cost-reimbursement contract to Raytheon Company under a request for proposals issued by the Department of the Army for ground-based radar.

- Westinghouse challenged the agency’s cost realism methodology, contending that the agency used a flawed, inaccurate, and out of date tri-service cost model in estimating certain costs. The protester stated that:
  - The agency admitted the flaws in its cost model; and
  - The unreasonableness of the methodology was evidenced by the agency’s conclusion that three sophisticated offerors had all submitted unrealistically low cost proposals.

- The Comptroller General found that:
  - The agency report established that the cost model did not constitute the agency’s primary methodology for evaluating cost realism.
  - The agency had performed a “bottoms-up” analysis, by which evaluators assigned to specific portions of the proposals estimated the cost of performance as proposed for each offeror.
  - The cost model, which the agency contends is not flawed, was only used along with other models to verify the “bottoms-up” analysis.
  - The agency adjusted the protester’s $943 million proposal upward over by $520 million (over 55 percent). Of the $520 million, $470 million came in three areas -- $105 million in material cost; $69 million in subcontract costs; and $296 million in interdivisional transfer costs.
  - Extensive agency documentation and hearing testimony supported the agency probable cost estimates.

- The Comptroller General denied the protest.


You may reasonably exclude costs that are not a substantial part of total contract cost from your probable
cost estimate for performance when the solicitation did not specifically state that these costs would be included.

**For example:** In a 1996 case, Allied Technology Group, Inc. (ATG) protested an award of a cost-plus-incentive-fee contract to Weiss Associates under a request for proposals issued by the Department of Energy for environmental restoration, decontamination and decommissioning, and waste management activities at the Laboratory for Energy Related Health Research (LEHR) and other selected sites in California.

- ATG contended that the agency's cost realism analysis was nonexistent or flawed, specifically contending that in evaluating Weiss's probable costs, the agency improperly failed to consider $1.5 million attributable to Weiss's subcontractors.
- The Comptroller General found that:
  - The agency evaluated cost proposals on the basis of the specified labor mix and level of effort.
  - The agency specified the level of effort and the skill mix necessary to perform the contract in the RFP and the offerors proposed costs on that basis.
  - Evaluators analyzed personnel labor rates, subcontractor costs, overhead rates, and general and administrative (G&A) rates, to determine whether they were reasonable or understated.
  - Evaluators took no exceptions to the costs proposed by Weiss or ATG.
  - The only issue identified by ATG with respect to Weiss's costs concerned the agency's evaluation of certain subcontract costs.
  - Weiss identified five subcontractors, two for which costs were proposed and three for which costs were not.
  - Weiss estimated that the cost for these three subcontracts would be "significantly less than $100,000."
  - Cost evaluators noted this and estimated the maximum potential impact as $1.5 million ($300,000 per year for 5 years), but did not include this cost in the probable cost estimate.
  - The cost evaluation board did advise the source selection official of its assessment that the subcontracts were currently unnecessary and if used, would not cost nearly the $1.5 million estimate.
- The Comptroller General denied the protest, because:
  - An agency is not required to verify each and every item in conducting its cost realism analysis.
  - An agency may rely on information contained in offerors' cost proposals in performing a cost evaluation without seeking additional independent verification of each item of proposed cost.
  - ATG was not prejudiced by the omission of these subcontractor costs in the cost realism assessment.
  - Reasonably construed, Weiss's proposal estimates the collective effort of these subcontractors as less than $100,000 per year, not $100,000 per subcontractor.
  - Accordingly, less than $500,000 ($100,000 per the five contract years) would be added to Weiss's proposal.
  - Since ATG's proposal was more than $2 million higher than Weiss's, the selection decision would not change.

Cost realism analysis is most commonly used to evaluate specific elements of each offeror's cost estimates, and reflect a clear understanding of the requirement as described in the offeror's technical proposal.

**For example:** In a 1994 case, JWK International Corporation protested the award of a contract to Value Systems Services (VSS), a division of VSE Corporation, under a request for proposals issued by the Naval Air Systems Command (NAVAIR) for the acquisition of logistics support services for Navy and Marine avionics weapons systems.

- JWK contended that the Navy's determination that JWK's proposal presented a high performance risk was unreasonable because the Navy unreasonably determined that JWK's proposed salaries were too low and that JWK proposed excessive uncompensated overtime.

- The Comptroller General found that:
  - Offerors were required to propose fully-burdened, fixed hourly rates for each labor category set forth in the RFP.
  - The solicitation provided that proposed labor rates would be evaluated for realism and that a proposal determined to have unrealistic rates would be assessed as having high performance risk.
  - The agency determined that JWK's proposed salaries were too low to retain a qualified work force, based on comparisons of proposed labor rates and salaries with the rates and salaries on:
    - JWK's incumbent contract;
    - Other JWK contracts;
    - The Independent Government Estimate; and
    - The general schedule (GS) salaries of comparable civil service employees.
  - The agency found that JWK proposed to have its employees work 47 hours per week including 7 hours per week of uncompensated overtime.
  - The agency reached its conclusion that JWK would require its employees to work 47 hours per week despite representations in the JWK proposal that its employees would work 45 hours per week.
  - The 2-hour difference related to understated indirect labor hours for leave and holidays.
  - The agency viewed 7 hours per week of uncompensated overtime as excessive and as contributing to the risk that JWK would be unable to retain its employees.
  - The Navy concluded JWK's proposed cost was unrealistic and its proposal presented a high performance risk, because of JWK's low salaries and excessive uncompensated overtime.

- The Comptroller General denied the protest.

**Failure to Perform an Adequate Cost Realism Analysis** (ManTech Envir. Tech., Inc., CGEN B-271002.3, June 3, 1996).

Whenever the resulting contract will be flexibly-priced, the contracting officer has a responsibility to conduct a cost realism analysis. If the contracting officer fails to perform an analysis or the results of that analysis are not reasonable, it is unlikely that the contract award decision will withstand scrutiny by The Comptroller General.

**For example:** In a 1996 case, ManTech Environmental Technology, Inc. protested the award of a cost-plus-fixed-fee contract to Dynamac Corporation under a request for proposals issued by the Environmental Protection Agency (EPA) for technical support services.

- ManTech raised a number of evaluation issues, primarily contending that the EPA failed to properly evaluate the realism of Dynamac's proposed costs. For example:
  - Dynamac's overall proposed costs were significantly lower than the Independent...
Government Estimate and the costs proposed by the other offerors.

- Although the technical proposal reflected Dynamac's intent to hire "as many of the incumbent staff as possible," the direct labor rates proposed for "new hires" were lower than:
  - Those paid incumbent ManTech personnel; and
  - Current Dynamac personnel in comparable positions.

- The Comptroller General found that:
  - The agency cost advisory report, pre/post negotiation memorandum, and source selection decision were all based on the written and oral DCAA analyses which purportedly found Dynamac's direct labor rates to be realistic. However, the DCAA audit and cost advisory report were qualified and the information on which they were based was incorrect.
  - Notwithstanding the agency's reliance on DCAA, there is no evidence that the agency cost evaluators considered DCAA's qualification of its usual recommendation that the proposal was acceptable as a basis for negotiation of a fair and reasonable price.
  - This qualification was based on DCAA's need for technical assistance in mapping the proposed labor rates to the RFP and evaluating Dynamac's weighted labor rates.
  - DCAA had requested assistance from the agency in determining whether the personnel, at the rates proposed, were appropriate for the positions identified in the RFP.
  - The agency did not provide any assistance.
  - Dynamac advised DCAA that its proposal manager had reviewed the RFP and had selected qualified individuals for the proposal.
  - DCAA verified that the labor rates for individuals named the cost proposal represented actual Dynamac 1995 labor rates.
  - While this DCAA assessment provides a reasonable basis for accepting labor rates for the named individuals, EPA accepted DCAA's limited statement as verification of all direct rates.
  - Since Dynamac had provided verifiable personnel rates for less than half of the 54 labor categories listed in its cost proposal, it was unreasonable for the agency to rely on this aspect of the audit to support a finding of cost realism for all direct rates.
  - There was no way to gauge the reasonableness of the proposed rates based on the audit analysis.
  - There was no indication that the agency attempted to assess the realism of the new hire rates.
  - The agency explained that it had received oral information from DCAA indicating that DCAA had verified the new hire rates.
  - During the protest, the agency learned that the DCAA auditor had confused this audit with another Dynamac audit being conducted at about the same time. The auditor did not verify the new hire rates proposed for the agency contract, believing that it was unnecessary because the other audit had verified the proposed rates.
  - While agencies may ordinarily rely on the advice of DCAA when performing a cost realism analysis, a contracting officer's determination based on incorrect information is not rendered reasonable because the incorrect information was supplied by another organization such as the DCAA.
  - The agency's cost evaluators qualified their evaluation by stating that they did not assess whether the personnel, at the rates proposed, met the RFP requirements.
The technical evaluation panel (TEP) documented concerns about the low Dynamac labor rates.

The TEP had noted that the rate proposed for a P-3 (second highest) level ecologist "seems very low" and that all the new hires were listed at low rates suggestive of entry level positions.

The TEP was concerned that "quality people cannot be hired at these rates" and observed that only a few existing employees worked at the rates identified for new hires.

Apart from relying on the DCAA audit information, written and oral, the agency apparently conducted no other cost realism analysis of Dynamac's direct labor rates. For example, the agency did not:

- Conduct any independent reasonableness review of the proposed rates,
- Question any of the rates in discussions, or
- Seek substantiation of the rates through market surveys or historical cost data from similar contracts.

The record does not include any of the "other" information on which the evaluators said they relied and, at the time of the agency's cost review.

The only thing that is apparent is that Dynamac's realistic costs are higher than those it proposed, but it is not clear how much higher they should be.

- The Comptroller General sustained the protest and recommended that the agency conduct a reasonable and complete cost realism analysis of Dynamac's direct and indirect costs.

### 8.4 Considering Cost Realism In Fixed-Price Proposal Evaluation

**Cost Realism Analysis in Fixed-Price Proposal Analysis (FAR 15.404-1(d)(3)).** For fixed-price contracts, you must not adjust offered prices as a result of your analysis. However, you may use cost realism analysis in assessing:

- Contract performance risk. For example, you could use cost realism analysis:
  - As a factor in evaluating the offeror's relative understanding of contract technical requirements and the performance risk associated with the offeror's technical proposal.
  - Technical offer acceptability.
  - In conjunction with price reasonableness as a separate factor for proposal evaluation, using words such as "Among those offers determined to be technically acceptable, award will be made to the responsible offeror who offers the lowest reasonable and realistic price."

- Offeror responsibility.

**Cost Realism in Performance Risk Trade-Off Analysis (Cardinal Scientific, Inc., CGEN B-270309, Feb. 12, 1996).**

Proposal trade-off evaluation criteria for a firm fixed-price contract may include cost realism analysis as one criterion for evaluation of the offeror's technical proposal. An unrealistic price may indicate deficiencies in the offerors understanding of contract quality and schedule requirements. A contract priced at a loss or at a minimal profit may represent a substantial performance risk.

**For example:** In 1996, Cardinal Scientific, Inc. (CSI) protested the award of a fixed-price contract to Defiance Electronics Inc. under an RFP issued by the Defense Logistics Agency (DLA), for portable x-ray darkrooms.

- CSI contended that the RFP contained defective evaluation factors and challenged the agency's evaluation of proposals.
- The Comp Gen found that:
  - The RFP stated that the agency would evaluate proposals based on proposed price and...
three factors (listed in descending order of importance): technical approach, management approach, and corporate experience/past performance.

- Technical evaluation criteria provided that the agency would evaluate proposals for realism, as it relates to an offeror's demonstration that the proposed price provides an adequate reflection of the offeror's understanding of the requirements of the solicitation.
- Only CSI and Defiance submitted proposals.
- The agency was initially concerned about the significant price difference between the two proposals. Accordingly, it requested and obtained information other than cost or pricing data from both offerors.
- Analysis of final proposal revisions (FPRs) revealed that both offers were technically acceptable:
  - CSI had three strong points under management approach and past performance;
  - Defiance had one strong point under management approach; and
  - Defiance’s FPR was $894,658, approximately half as much as CSI's FPR.
- A cost realism analysis found that Defiance's proposal demonstrated that its expected costs and overhead would allow it to successfully perform the contract and achieve a reasonable profit.
- The contracting officer:
  - Concluded that Defiance's proposal represented the best value to the Government, because CSI's slight technical advantage did not warrant the payment of the significant price premium associated with CSI's proposal.
  - Recommended award to Defiance and the source selection authority (SSA) concurred.
- The Comptroller General denied the protest.

Cost Realism in Evaluating Technical Offer Acceptability. When award will be made to the lowest price, technically acceptable, offeror, each offeror may be required to provide documentation supporting the realism of the prices proposed. If an offeror fails to furnish pricing documentation expressly requested and necessary for the agency to perform a cost realism analysis, the agency may properly reject the proposal, even though the offeror asserts that it could perform the required work at the proposed price.

For example: In a 1989 case, Industrial Maintenance Services, Inc. (IMS) (Ind. Maint. Svcs., Inc. & Log. Suprt., Inc., CGEN B-235717.2, Oct. 6, 1989), protested the Department of the Navy's award of a firm fixed-price food service contract to United Food Services (USF).
- IMS contended that:
  - While its offered price did not include certain required fringe benefits, this omission did not warrant the rejection of its offer.
  - The solicitation only required the contractor to provide its employees with these fringe benefits, not that the offeror expressly include the costs for these items in its proposed price.
  - The agency's rejection of its offer must have been based on a finding that it was nonresponsible--i.e., and should have been referred to the Small Business Administration under its certificate of competency (COC) procedures.
- The Comptroller General found that:
  - The solicitation required offerors to submit manning charts indicating the personnel that the contractor would employ to perform the contract.
  - Award criteria stated that award would be made to the low, responsive--that is, technically acceptable--offeror.
Twenty-seven firms responded to the RFP, submitting proposals ranging from a low monthly price of $39,485 to a high of $286,100.

The agency solicited final proposal revisions (FPRs) by amendment, and in view of the wide disparity in initial prices, also cautioned offerors that proposals found unrealistic in terms of price would be rejected.

The FPR prices still varied by more than $150,000 per month, and the agency, concerned that this continued disparity in price reflected a lack of understanding of the solicitation requirements, issued an amendment reopening the competition for a second round of FPRs and requiring offerors to include:

- A breakdown of the projected daily man-hours necessary to perform the contract, as well as
- An annotated, loaded compensation rate specifying the wage rates, fringe benefits and insurance to be paid employees as determined by the applicable wage determination.
- The agency also advised offerors that the estimated minimum staffing level for contract performance was 14,000 man-hours per month, and warned that proposals containing less than 98% of this estimated manning level would be rejected as unrealistic.
- IMS submitted the third low revised offer at a price of $114,540 per month, and UFS was seventh low at a price of $126,585 per month.
- The agency rejected as unrealistic the proposals of the six low offerors (including IMS) finding that each had failed to provide documentation that the agency could use to determine that the proposed prices in fact were realistic.
- For IMS, the agency determined that either IMS's price did not include amounts to pay employees according to the terms of the wage determination, or that if it planned to abide by the terms of the wage determination, its price was insufficient to support its proposed staffing level.
- The agency then made award to USF as the low, acceptable offeror.

The Comptroller General denied the protest.

Cost Realism as a Separate Evaluation Factor (Culver Health Corp., CGEN B-242902, Jun. 10, 1991). A solicitation may establish cost realism as a separate evaluation factor to be considered along with price reasonableness in making the contract award decision.

For example: In 1991, Culver Health corporation protested the award of a contract to NES Government Services, Inc. under an RFP issued by the United States Army Health Services Command for the healthcare services of General Medical officers at Army Medical Training Facilities across the United States. The award to NES was for Region II, which includes eight locations in the Western United States.

- Culver contended that:
  - Its offer was improperly evaluated.
  - Its prices and compensation rates were compiled after an extensive industry evaluation and discussions with prospective physicians and were realistic.
  - Because this is a fixed-price contract, all of the risk of Culver's alleged low prices would fall entirely on the contractor and that it was simply not reasonable to reject its low offer.
  - The contracting officer in evaluating the Region II proposals improperly relied upon the Government estimates which it points out were considered by the evaluators to be questionable in Region I due to the fact that all of the offers received for that region were below the estimate.

- The Comptroller General found that:
  - The RFP stated that cost/price would be one of three evaluation criteria considered in making contract award. It also stated that "Price will be evaluated, but not scored, for
reasonableness and realism."

- Fifteen offerors responded to the solicitation.
- During subsequent written discussions and the agency expressed its concern regarding Culver's compensation rates by stating: "At this time, the compensation rates you proposed appear to be unrealistically low. Request a complete review of your offer with cost realism in mind."
- After three rounds of discussion and FPRs, Culver's was the lowest offer at a total price of $6,300,714, while NES's $7,215,410 offer was the next low of the seven offerors remaining. Both of the offers were considered acceptable under the two technical evaluation factors.
- The evaluators were concerned that Culver's proposed hourly physician compensation for the Fort Hood, Carson, Polk, and Ord locations was significantly below the agency's estimates and thus recruitment and retention of physicians would become a problem. Further, the evaluators noted that Culver's total amount allowed for compensation in Region II, $5,167,959, was significantly lower than the agency's estimate of $5,860,900 and that its total price of $6,300,714 was also much lower than the overall agency estimate of $8,099,658 for Region II.
- The evaluators concluded that Culver's "overall rates are not realistic and would have an adverse effect on much needed performance" and the agency rejected the offer as unrealistically priced.
- NES's compensation total of $6,059,490 was higher than the Government's $5,860,900 estimate and it was more in line with the other offerors and was considered by the evaluators to be realistic, as was its $7,215,410 overall price.
- NES was awarded the contract for Region II as the low acceptable offeror with realistic pricing.

- The Comptroller General denied the protest.
In Government contracting, financial analysis involves analysis of the:

- Financial capability of potential contractors. Decisions on contractor responsibility must consider whether the offeror has adequate financial resources or the ability to obtain them.

- Effect that Government financing decisions will have on contractor financial management. Decisions on Government financing, including progress payments or performance based payments must consider the contractor’s financial condition.

- Need for Government protection from performance problems that may result from contractor financial problems. Decisions on whether to require performance bonds for contracts other than construction contracts or require subordination agreements should consider the financial risk associated with Government financing.

- Financial condition of current and potential contractors as part of Defense Industrial Capability Assessments. These assessments are performed to determine if there is a need for government action to preserve a critical defense capability and often focus on the profitability of a specific operating location or product line as well as the company’s overall financial condition. Unique requirements related to these assessments are contained in DoDi 5000.60 (Defense Industrial Capabilities Assessments) and DoD 5000.60 (Assessing Defense Industrial Capabilities).

Analysis Responsibility. Whether you must perform the analysis yourself or interpret the analysis of specialists (e.g., auditors, financial analysts, price/cost analysts), you must understand the basic concepts of financial analysis. Financial analysis typically provides information, not clear-cut answers. To do your job effectively, you must be able to ask the right questions and make the right decisions. If challenged by the contractor or others involved in the acquisition process, you must be able to defend that decision. Keep in mind that your objective when performing financial analysis is to determine the impact of weak finances on contract performance or, in the case of Industrial Capability Assessments, the company’s desire to continue producing a critical defense product or service.

Relationship Between Assets, Liabilities, and Owner's Equity. To effectively perform a financial analysis, you must understand the relationship between assets, liabilities, and owner's equity. Assets are the economic resources of the firm which are capable of giving service benefits to future operations and which can be measured objectively in monetary terms. The sources of these assets are the liabilities of the firm and owner's equity. The "basic accounting equation" is:

\[ \text{Assets} = \text{Liabilities} + \text{Owner's Equity} \]

Liabilities are the claims by parties outside the firm against the assets of the firm. Owner's equity is the owner's (sole proprietor's, partners', or stockholders') financial claim against the assets of the firm. For example: Two people each invest $10,000 in a business partnership. At that point in time, the firm's assets are $20,000; liabilities are zero; and owner's equity is $20,000. The next day they borrow $5,000 and purchase new equipment for $25,000. Now, the firm's assets are $25,000; liabilities are $5,000; and owner's equity is $20,000. Note that the firm's assets always equal the firm's liabilities plus owner's equity.

Tangible and Intangible Assets. Assets are the economic resources that are either tangible or intangible:

- **Tangible Assets.** Most assets are tangible -- they have physical substance, and their value comes from the use of that physical substance. Examples include: land, buildings, and equipment.

- **Intangible Assets.** Other assets are intangible--they do not have physical substance but nevertheless have value. Their value comes from a legal claim or excess earning power caused by a business transaction (e.g., goodwill, patents, or trademarks).

Current and Long-Term Assets. For financial analysis, assets are most often classified as current or long-term:

- **Current Assets.** These are assets that can be converted into cash within one year. They include:
  
  - Cash in the bank and on hand. However, only unrestricted cash that is freely available for withdrawal to meet company liabilities shall be classified as a current asset.
  
  - Marketable securities listed for trade through a licensed brokerage firm. They may include U.S. Government obligations, State and Municipal obligations, Corporate Securities, and Money Market Instruments.
  
  - Accounts receivable from sales made and billed to customers on credit terms. Only
customer accounts receivable arising from the sale of company products shall be classified as a current asset.

- Inventory that is good and salable.
- A merchandising company typically only has one class of inventory, items purchased from suppliers that are awaiting resale.
- Service companies also typically have one class of inventory, production supplies.
- Manufacturers typically show three different classes of inventory: raw materials, work-in-process, and finished goods.
- Other Current Assets, which typically include prepaid insurance, taxes, rent, and interest. Normally, this category is not large in relation to other balance sheet items.

- Long-Term Assets. These are items that a business cannot easily turn into cash and are not consumed within one year. They include:
  - Fixed assets, the materials, goods, services, and land used in production.
  - Examples include: real estate, buildings, plant equipment, tools and machinery, furniture, fixtures, office or store equipment, and transportation equipment.
  - The book value of all fixed assets, except for land, is depreciated (reduced) annually to consider the reduction in value over the asset's useful life.
  - Other long-term assets, including:
    - Marketable securities not listed for trade through a licensed brokerage firm.
    - Land, equipment, or buildings not used to produce customer goods or services.
    - Investment in subsidiary companies.
    - Intangible assets or assets usually not available for payment of the debts of a going concern (e.g., goodwill, patents, copyrights, mailing lists, catalogues, trademarks, organization expense, drawings, dies, cuts, patterns, and stock expenses)
  - Amounts due from officers or stockholders.
  - Mortgages and real estate contracts held by the contractor.
  - Claims and miscellaneous accounts.

Current and Long-Term Liabilities. Most liabilities require the payment of a specific sum of money to a particular party at a specified time in the future. However, some liabilities may be indefinite; the debt may be settled by some means other than the payment of money; the creditor may not be known; or the due date may be uncertain.

- Current Liabilities. Current liabilities are obligations that a business must pay within a year. Generally, they are obligations that are due by a specific date (usually within 30 to 90 days). However, trade practices may permit the exclusion of certain accounts such as customer's deposits and deferred income, provided the firm's records include an appropriate explanation. Current liabilities include:
  - Notes payable, including notes payable to banks, notes payable to officers or stockholders of affiliated companies, notes payable to the trade, and notes payable to others.
  - Accounts payable for merchandise or material requirements purchased on credit terms and not paid.
  - Accrued expenses including: reserve for taxes; amounts due officers, stockholders, etc.; amounts due affiliated companies; dividends unpaid; and funded current debt.
  - Currently due portion of long-term liabilities.
• Long-Term Liabilities. Long-term liabilities are liabilities that will mature in excess of one year from the balance sheet date. Normally, items in this area are retired in annual installments. Long-term liabilities include:
  o Funded debt including serial bonds; notes on mortgage installments, mortgages; and other funded debts due after one year. This is the most common type of long-term debt.
  o Miscellaneous deferred liabilities including such accounts as reserves for insurance and reserves for contingencies.
  o Deferred credit such as unearned income carried as a liability until the related product is completed and delivered.

Owners' Equity. Owners' equity is often referred to as net worth, because it is the net difference between the total assets and the total liabilities of the firm. It represents the owners' claims against the assets of the firm, but it is not a claim against a specific asset (e.g., cash). There are two sources:
  • Owner's Contribution. These contributions, sometimes referred to as capital stock, include cash or other assets.
  • Retained Earnings. These are the accumulated profits in excess of losses and payments to the owners. Earnings are retained by the firm to finance operations and growth.

Special Considerations: Parent/Subsidiary Relationships, Organizational Risk Assessments, and Parent Guaranty Agreements
• Divisions and operating segments are not legal entities separate from the corporate entity; a risk rating assigned to the corporate entity is applicable to its divisions and operating segments. Conversely, subsidiaries are legal entities separate from their parent companies, and they may have different levels of financial risk than their parents. Because a parent company can exercise significant control over the financial condition of its subsidiaries (through cash sweeps, sales of subsidiary assets, and other means), a subsidiary should not be assessed at a lower level of risk than that of its parent company.
  • To mitigate the government's risk, you should consider requiring a financial guaranty from the parent corporation when a contract will be awarded to a subsidiary.
    o If the parent is willing to provide such an agreement, the analysis should be performed at the parent level without requiring financial data from the subsidiary.
    o If the parent is unwilling to provide a guaranty, the analysis should be performed at the subsidiary level. Because, as noted above, a subsidiary should not be assessed at a lower level of risk than that of its parent, you should attempt to obtain parent financial data if possible.
      ▪ If the financial data of the parent indicates a lower level of risk than that of the subsidiary, the subsidiary should be assigned the higher level of risk associated with its own financial condition.
      ▪ If the financial data of the parent indicates a higher level of risk than that of the subsidiary, the subsidiary should be assigned the higher level of risk associated with the parent

9.1 Identifying Sources Of Financial Information
Analysis Comparisons. Analysis of the financial strength of a particular firm always involves comparison.
• Comparisons To Consider. The most common are comparisons with the:
  o Same company over time to identify trends in financial capability. Normally, you should consider trends in a firm's financial capabilities over a period of at least three years.
  o Same Industry to see how the firm compares with industry averages. If the same type comparison is not available, consider one very similar and then allow/adjust for known or
assumed differences.

- **Comparisons Not To Consider.** Do not make comparisons between:
  
  o Individual companies.
  
  o Two firms being compared may both be financially unsound. In that case, you might judge them to be equally sound and capable of performing the contract. Instead, neither should be considered for award.
  
  o One of the firms being compared may be the strongest firm in industry. A second firm might look poor by comparison but still be one of the soundest firms in the industry.
  
  o A company and averages for firms in a different industry or averages for all firms in all industries. Different industries require different financial structures. For example, you would not expect an engineering services firm to have the investment and assets required of a firm involved in the manufacture of heavy equipment.

**Data Available on Individual Entities.** To perform financial analysis, you must obtain financial data concerning the entity under analysis. Key sources of information include:

- **The Entity Itself.** The entity that you are about to analyze should be your primary source of information.

  o Publicly traded corporations must prepare annual reports. These reports include several items of information that will be useful in performing a financial analysis:
    
    o Balance sheets that identify major categories of assets, liabilities, and owner's equity.
    
    o Profit and loss statements for the fiscal year.
    
    o Statement of cash flows for the fiscal year.
    
    o Other information such as problems encountered during the just-completed fiscal year; plans for the future; contingent liabilities; off-balance sheet matters; and auditors notes to the financial statements.

  o Sole proprietorships, partnerships, and other privately held companies are not generally required to prepare annual reports. Normally, you should require these firms to submit financial statements (balance sheets, profit and loss statements, and cash flow statements). Because sole proprietorships and partnerships are not legally separate from the owners of the firm, these documents will include personal as well as business assets. It is desirable to have certified financial statements prepared by an independent Certified Public Accountant (CPA), but preparing certified statements would require an audit, which can be expensive. If certified financial statements from a CPA are not available, certification of their accuracy by the sole proprietor, partner, or an appropriate officer of the firm may be acceptable.

  o Additional useful information that the firm can provide includes accounts receivable and payable aging reports; lines of credit; and bank references.

  o Information about both publicly traded and privately held companies may also be available on the company’s website.

**The Government.**

- **The Securities and Exchange Commission (SEC).** The SEC publishes the filings required of publicly traded companies on its website at [http://www.sec.gov/](http://www.sec.gov/). In addition to annual and quarterly financial reporting, filings include notices related to large stock transactions, compensation of officers, and other information useful for a complete analysis. The annual and quarterly financial filings may include

  o Financial Statements (balance sheet, income statement, and cash flow statement) and their accompanying auditor's notes,

  o A statement from the company’s public accounting firm on the reliability of the information
provided,
  - A complete description of all business lines,
  - Corporate financial data broken down by operating division,
  - Description of any significant developments in the corporation that could impact earnings,
  - List of major debt holders and when debt is due, and
  - Executive compensation

In addition to the information on individual companies available on the SEC website, the site also provides a wealth of educational information. Though it is the primary overseer and regulator of the U.S. securities markets, the SEC works closely with many other institutions, including Congress, other federal departments and agencies, the self-regulatory organizations (e.g. the stock exchanges), state securities regulators, and various private sector organizations.

- Federal Reserve Bank Credit Reports. Contractors who apply for guaranteed loans on Government contracts submit to a thorough credit investigation by the Federal Reserve Bank. The reports of these investigations are available to the contracting officer.

- Commercial Sources. There are many excellent sources available; some have a fee or require membership but some information is free. These include:
  - **Dun and Bradstreet** (www.dnb.com): provides individual reports on current developments concerning size, credit, etc., for many United States and foreign companies. Examples of types of reports available from D&B include
    - Industry Norms and Key Business Ratios
    - Business Information Reports - the most widely used type report
    - Comprehensive Reports
    - **Moody's Investor Services**: publishes financial data for a wide variety of companies as well as other financial products and services.
    - **Hoovers** (a D&B company): provides company and industry reports and other financial data.


**Standard and Poor's** (a McGraw-Hill subsidiary) provides
- Corporate Records-provides information on over 12,000 corporations.
- Stock Reports-provides information on over 4,000 corporations.

**Thomas Register** provides Company Profiles.

**The Value Line Investment Survey**-provides an analysis of approximately 1,700 companies and 90 industries. It contains historical data on earnings, dividends, sales, working capital, and appraisals of the future prospects for the company. Although mainly a manual for investors, it includes valuable general information for financial analysis.

- The Risk Management Association (RMA) eStatement Studies-provides composite financial data on manufacturing, wholesaling, retailing, service, and contracting lines of business. Financial statements on each industry are shown in common size form, and widely used ratios are calculated to enable comparison of an individual company with norms for its particular line of business. RMA also offers training and electronic tools on its website at: [http://www.rmahq.org/RMA](http://www.rmahq.org/RMA)

### 9.2 Identifying Key Financial Indicators

**Financial Ratios.** Most financial analysis involves the use of ratios. There are numerous ratios that you can calculate to support financial analysis. You should determine which ratios provide you with the type of
information that you need to support your analysis. This section examines common examples of four types of ratios: short-term solvency ratios; long-term solvency ratios; efficiency ratios; and profitability ratios. In addition, this section also delineates a model that combines the results of several ratios to provide an indication of financial distress and possible bankruptcy.

Use Caution in Financial Analysis.

- Changes in accounting practices may make it difficult to compare financial ratios calculated in different time periods. For example, if material costs are increasing, a change from first-in-first-out (FIFO) to last-in-first-out (LIFO) inventory accounting could substantially decrease inventory value with no change in the actual units in inventory. That will affect every ratio that includes inventory value. One source of information about accounting system changes is the corporate financial report. Another is the cognizant Government auditor.

- Financial ratios of companies reporting in accordance with financial standards other than U.S. Generally Accepted Accounting Principals (GAAP), such as International Financial Reporting Standards (IFRS) or foreign country-specific financial reporting standards, may not be comparable with industry norms of companies whose ratios are calculated in accordance with U.S. GAAP. Note, however, that efforts are underway for convergence of U.S. GAAP and IFRS, and the SEC is exploring the potential use of financial statements prepared in accordance with IFRS by U.S. issuers.

- Financial statements represent only one source of financial information concerning a firm and its environment. Other information (i.e. changes in costs or market demand) not disclosed in financial statements may have an impact on the evaluation of financial capabilities.

- Historically, most financial statements were not adjusted either for changes in market values or in the general price level. This could seriously affect comparability between firms and industry averages. In an effort to address this issue, since late 2007 companies reporting in accordance with U.S. GAAP have been required to “mark to market” and report the “fair value” of their assets.

- As ratio analysis has increased in popularity, there has sometimes been a tendency to develop ratios which have little or no significance. A meaningful ratio can be developed only from items which have a logical relationship.

- The importance of particular ratios and acceptable norms may vary widely among industries due to differences in sales patterns, unique financing arrangements, or other factors.

Short-Term Solvency Ratios (FAR 9.106-4(a) and FAR 53.301-1407). In most financial analyses, you will primarily be concerned with the contractor’s ability to meet its current obligations, because most contracts take less than one year to complete. Solvency, or liquidity, ratios provide you with measures of the contractor's ability to meet current obligations. Any preaward survey of an offeror's financial capability should consider both the acid test ratio and the current ratio in every analysis of contractor financial responsibility.

Current Ratio: This is the ratio of current assets to current liabilities. It provides an indication as to the degree to which an entity has sufficient current assets to pay its current liabilities. If it does not have sufficient current assets, it may be forced to liquidate some of its long-term assets, take on additional long-term debt, or acquire additional capital investment to enable it to pay its current obligations.

\[
\text{Current Assets to Current Liabilities Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}
\]

In general, a current ratio of 2 to 1 (2.0) or higher is desirable. However, the norm may vary from industry to industry. A high current ratio in comparison with other firms in the industry indicates a greater ability to satisfy current liabilities. However, a ratio that is too high may signify management inefficiency, because too large a proportion of the firm's assets is being held as nonproductive assets. Also, be careful when inventory is a large portion of current assets. Values may be inflated by obsolete inventory that has a high book value, but no value in the marketplace.

Acid Test Ratio. (also known as the quick ratio) This is a more stringent test of an entity’s ability to meet its current liabilities than is the current ratio. While the current ratio includes all current assets in the numerator, the acid test only includes the most liquid assets in the numerator — those which the company can most easily convert to cash if necessary to enable it to pay its current liabilities. A commonly used
The definition of the acid test ratio is "current assets less inventory" divided by "current liabilities".

\[
\text{Acid Test Ratio} = \frac{\text{Cash + Current Inventory}}{\text{Current Liabilities}}
\]

Other definitions also exclude prepaid expenses from the numerator or only include cash plus marketable securities. In comparing a particular company's acid test ratio against industry benchmarks, it is important to ensure that the ratios are calculated in the same manner. In general, a company with an acid test ratio of 1 to 1 (1.0) or higher is considered to be in liquid condition. However, the norm may vary from industry to industry. A high ratio in comparison with industry averages indicates a greater ability to satisfy current liabilities but too high a ratio may signify management inefficiency, because too large a share of the firm's assets is being held as nonproductive assets.

Long-Term Solvency Ratios (FAR 9.106-4(a) and 53.301-1407). A firm with long-term solvency problems may find it difficult to obtain financing for short-term operations. If it is able to secure short-term financing, it may have to pay higher than market rates, further worsening its financial situation. Long-term solvency is particularly important for contracts and programs extending beyond one year. Long-term solvency ratios, also known as leverage ratios, measure the firm's long-term ability to meet its financial obligations. Consider the Total Liabilities to Net Worth Ratio in every preaward survey of contractor financial responsibility. You may also wish to consider the Debt Ratio.

- **Total Liabilities to Net Worth Ratio.** Also known as the Debt to Equity Ratio, this ratio measures the relative shares of debt and owner's equity used to finance the operations of the firm. Depending on the source, you may find this ratio expressed either as a decimal or a percentage.

\[
\text{Total Liabilities to Net Worth Ratio} = \frac{\text{Total Liabilities}}{\text{Net Worth}}
\]

Or written another way:

\[
\text{Debt to Equity Ratio} = \frac{\text{Total Debt}}{\text{Owner's Equity}}
\]

Note that these are the same ratios, as Total Liabilities is simply another name for Total Debt, and Net Worth is another name for Owner's Equity. A ratio that is lower than industry averages indicates a relatively lower reliance on debt as a source of funds. This would normally place the firm in a relatively favorable position to borrow money. However, a higher ratio may be desirable at times, especially when a firm is expanding operations. Expanding operations might require increased production and expanded inventories. Debt may be the best source of funds. As operations stabilize at the higher level, cash flow should improve -- permitting reduced reliance on debt as a source of funds.

- **Debt Ratio.** This ratio measures the percentage of total assets supplied by creditors.

\[
\text{Debt Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}
\]

This ratio is a different way of looking at the same facts considered in the Total Liabilities to Net Worth Ratio. A Debt ratio of .50 would mean that half the funds required to finance total assets came from debt. A Total Liabilities to Net Worth Ratio of 1.00 would have the same meaning. A Debt Ratio that is low when compared to other firms in the industry indicates that the firm has less reliance on debt as a source of funds. That also indicates lower risk and greater financial stability.

Efficiency Ratios. Efficiency or operating ratios are measures of the firm's intensity of asset use. Among the principle efficiency ratios are measures of asset turnover, the average length of time required into cash. The less time required, the more efficiently the firm is operating. Other efficiency ratios, such as accounts payable turnover, indicate how effectively the firm is using liabilities to generate revenue. Higher efficiency normally indicates higher profitability.

Contractor trends over time are particularly important. A contractor that is becoming less efficient in using its assets will likely face declining profits and an increasing reliance on borrowing as a source of funds. Declining ratios may also indicate that the contractor is not reacting to a changing market place (e.g., a failure to reduce inventories even though sales are declining).

- **Inventory Turnover Ratio.** This ratio provides an indication of the time required to turn inventories into cash.
A ratio that is lower than the industry average may indicate that too much cash has been invested in inventory. Excessive inventories tie up funds that could be used elsewhere in operations. They also increase operating costs associated with holding inventory. A ratio that is higher than other firms in the industry may indicate that the firm has insufficient inventories to meet demand. However, it may also indicate that the firm has developed more efficient inventory management methods.

- **Sales to Assets Ratio.** This ratio, also known as the asset turnover ratio, measures the intensity with which assets are used to produce sales revenues.

\[
Sales \ to \ Assets \ Ratio = \frac{Net \ Sales}{Average \ Total \ Assets}
\]

Average total assets are calculated by adding beginning total assets plus ending total assets and dividing the sum by two. The higher the ratio the more sales dollars are produced by each asset dollar and the more efficiently the firm is operating.

**Profitability Ratios.** Profitability ratios examine management's overall effectiveness in earning profits. Profitable companies are generating additional funds that can be used to finance company operations. Gross profit is the difference between net sales and the cost of sales, which is the sum of the expenses required to manufacture, purchase, or service customers. Net profit is gross profit less all expenses directly related to the firm's operations, including income taxes. Net profit after taxes is the basic measure of a firm's operating success. It is net profit that is added to retained earnings or distributed to shareholders as dividends. When a loss occurs (a negative net profit), the loss is charged against net worth as a reduction to the equity account.

- **Gross Profit on Net Sales Ratio.** This ratio, also known as the gross margin ratio, calculates the average profit margin on sales. It can help identify trends in a firm's credit policy, purchasing, and general merchandising.

\[
Gross \ Profit \ on \ Net \ Sales \ Ratio = \frac{Net \ Sales - Cost \ of \ Goods \ Sold}{Net \ Sales}
\]

It may vary widely among firms in the same industry, according to sales, location, size, and competition. Firms with a higher ratio are generally more attractive to potential creditors and investors.

- **Rate of Return.** This ratio quantifies the company's return on investment.

\[
Rate \ of \ Return = \frac{Gross \ Profit}{Fixed \ Assets + Net \ Working \ Capital}
\]

This ratio is commonly used to compare both companies and potential investments within a single company. A higher ratio indicates a relatively more profitable use of assets.

**Failure Prediction Model.** In addition to your analysis of the ratios delineated above, you should consider the failure prediction model developed by Edward I. Altman. This model employs the sum of five weighted financial ratios to calculate a Z-Score which is used to predict the possibility of future bankruptcy and indicate the need for further analysis. The Z-Score model is somewhat dated in that it does not address current business practices, such as the use of just-in-time inventory, and it should not be relied upon exclusively to form an opinion about contractor financial capability. Nevertheless, it may provide an initial alert of financial problems.

- **Ratios Used In Z-Score Calculation.** The ratios used in Z-Score calculation provide a broad view of the firm's financial health.

\[
A = Working Capital to Total Assets Ratio = \frac{Net \ Working \ Capital}{Total \ Assets}
\]

Net working capital is current assets less current liabilities. This ratio measures a firm's ability to pay off its short-term liabilities.

\[
B = Retained Earnings Total Assets Ratio = \frac{Retained \ Earnings}{Total \ Assets}
\]

This ratio measures a firm's use of its total asset base to generate earnings. However, manipulated retained earnings data can distort the numerical results.
The earnings before interest and taxes (EBIT) to total assets ratio, or the rate of return on assets, measures the productivity of a firm's assets.

\[
C = \text{EBIT to Total Assets Ratio} = \frac{\text{EBIT}}{\text{Total Assets}}
\]

This is the inverse of the Debt to Equity ratio. It shows the amount a firm's assets can decline in value before liabilities exceed assets.

\[
D = \text{Equity to Debt Ratio} = \frac{\text{Market Value of Common Stock + Preferred Stock}}{\text{Total Current Debt + Long-Term Debt}}
\]

This ratio is a measure of the firm's ability to generate sales.

\[
E = \text{Sales to Total Assets Ratio} = \frac{\text{Total Sales}}{\text{Total Assets}}
\]

### Ratio Weights For Z-Score Calculation

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Publicly Traded Manufacturing Firm</th>
<th>Privately Held Manufacturing Firm</th>
<th>Other Firm</th>
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<td>A</td>
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<tr>
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<td>1.0</td>
<td>1.000</td>
<td>N/A</td>
</tr>
</tbody>
</table>

- Weights Assigned Each Ratio In Z-Score Calculation. Because of differences in financing and other factors, the weight assigned each ratio in Z-Score calculation should vary based on the type of firm under analysis.

- Z-Score Analysis. Examine the current Z-Score, changes over time (3 to 5 completed fiscal years), and other available information to develop Z-Score projections for the contract period. Use the following table to interpret historical and projected Z-Scores:

<table>
<thead>
<tr>
<th>Prediction Based On Z-Score</th>
<th>Then there is...</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the Z-Score is ...</td>
<td></td>
</tr>
<tr>
<td>3.00 or more</td>
<td>Little chance of bankruptcy.</td>
</tr>
<tr>
<td>1.81 to 2.99</td>
<td>Some chance of bankruptcy.</td>
</tr>
<tr>
<td>1.80 or less</td>
<td>Large chance of bankruptcy.</td>
</tr>
</tbody>
</table>

### 9.3 Applying Financial Indicators To Responsibility Decisions

Responsibility Standard (FAR 9.104-1 and FAR 9.105-1). The general FAR standards for contractor responsibility, include the requirement that the prospective contractor have adequate financial resources to perform the contract or the ability to obtain them. Before making a determination of offeror responsibility, you must possess or obtain information sufficient to satisfy you that the prospective contractor meets this standard and the other FAR standards for contractor responsibility.

- Normally, the contracting officer must obtain this information, including preaward surveys, promptly after bid opening or receipt of offers. Limit requests for information to the low bidder or those offerors in range for award.

- However, in negotiated contracting (especially when research and development is involved), the contracting officer may obtain this information prior to issuing the request for proposals.

Preaward Survey (FAR 9.106-1(a)). Generally, you should obtain a preaward survey, including analysis of financial capability, when the information on hand or readily available is not sufficient for making a
determination regarding responsibility. However, unless circumstances justify its cost, you should not request a preaward survey for:

- Fixed-price contracts at or below the simplified acquisition threshold, or
- Contracts involving the acquisition of commercial items.

Contract Financing (FAR 32.107). If the contractor or offeror meets the standards prescribed for a responsible prospective contractor, do not treat the contractor's need for contract financing as a handicap for a contract award (e.g., a responsibility factor or an evaluation criterion). Do not disqualify a contractor from contract financing because the contractor failed to indicate a need for contract financing before the contract was awarded.

Financial Capability Requirements (FAR 53.301-1407). The Standard Form (SF) 1407, Preaward Survey of Prospective Contractor Financial Capability, provides insight into some of the areas that you should consider in evaluating a firm's financial capability. Financial capability reviews requested from DCMA are processed through its electronic Preaward Survey System (PASS) e-tools application rather than the SF 1407 itself. However, data reported in the PASS is consistent with that contained in the SF 1407.

- Current financial position from the latest balance sheet.
- Current assets to current liabilities ratio.
- Acid test ratio.
- Total liabilities to net worth ratio.
- Current and projected sales.
- Latest profit and loss statement.
- Working capital.
- Most recent credit rating.
- Business and financial reputation.

Current Financial Position Analysis. The balance sheet of the firm will provide you information on the firm's current financial position. The balance sheet is a report that summarizes the firm's assets and liabilities, as well as its net worth (owner's equity). The report is known as a balance sheet because the sum of all assets must equal (balance) the sum of liabilities and net worth.

For example, Lloyd's Manufacturing has provided you with the following information for the years 20X6 to 20X8:

<table>
<thead>
<tr>
<th>Accounts</th>
<th>20X6</th>
<th>20X7</th>
<th>20X8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$82,000</td>
<td>$80,000</td>
<td>$85,000</td>
</tr>
<tr>
<td>Accounts Receivable</td>
<td>$190,000</td>
<td>$200,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>$65,000</td>
<td>$55,000</td>
<td>$60,400</td>
</tr>
<tr>
<td>Other Current Assets</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Fixed Assets</td>
<td>$970,200</td>
<td>$975,500</td>
<td>$976,000</td>
</tr>
<tr>
<td>Total Assets</td>
<td>$1,307,200</td>
<td>$1,310,500</td>
<td>$1,301,400</td>
</tr>
<tr>
<td>Current Liabilities</td>
<td>$125,000</td>
<td>$120,500</td>
<td>$101,600</td>
</tr>
<tr>
<td>Long-Term Liabilities</td>
<td>$275,400</td>
<td>$295,800</td>
<td>$300,000</td>
</tr>
<tr>
<td>Total Liabilities</td>
<td>$400,400</td>
<td>$416,300</td>
<td>$401,600</td>
</tr>
<tr>
<td>------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Net Worth</td>
<td>$906,800</td>
<td>$894,200</td>
<td>$899,800</td>
</tr>
</tbody>
</table>

Taken alone, the balance sheets provide little insight into the firm's financial capabilities. You must analyze the data presented. The SF 1407 identifies three key ratios for analysis: the Current Assets to Current Liabilities (Current) Ratio, the Acid Test Ratio (Quick) Ratio, and the Total Liabilities to Net Worth Ratio.

In making your analysis, you should consider the 3-year trend in the ratios and a comparison between the ratios and the industry averages.

If analysis of these ratios raises a question or the use of other ratios seems appropriate, you should calculate the appropriate ratios and perform any additional analysis required.

Current Assets to Current Liabilities Ratio Analysis. As described earlier in the chapter, the current assets to current liabilities (current) ratio is calculated as follows:

\[
\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}
\]

For example: Using the data from the Lloyd's Manufacturing financial position presented above:

- Calculate 20X8 current assets. For Lloyd's Manufacturing, current assets will be the sum of cash ($85,000), accounts receivable ($180,000), inventories ($60,400), and other current assets ($0). That sum is $325,400.

- Calculate 20X8 current liabilities. For Lloyd's Manufacturing, current liabilities are $101,600.

Calculate the 20X8 current ratio.

\[
\text{Current Ratio} = \frac{\$325,400}{\$101,600} = 3.2
\]

- Compare with Industry Averages and Related Information. To evaluate Lloyd's Manufacturing 20X8 Current Assets to Current Liabilities Ratio, you should compare it with the industry. One source of industry averages is D&B's Industry Norms and Key Business Ratios, which indicates that the upper quartile of manufacturing firms in Lloyd's industry have an average current ratio of 2.8. The middle half have a current ratio of 1.3 and the lower quartile a ratio of .8. Lloyd's ratio of 3.2 appears to indicate that it is more financially secure than most of the firms in its industry.

Acid Test Ratio Analysis. As described earlier in the chapter, the acid test ratio is calculated as follows:

\[
\text{Acid Test Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}
\]

For example: Using the data from the Lloyd's Manufacturing financial position presented above:

- Calculate 20X8 sum of cash, marketable securities, and net accounts receivable. For Lloyd's Manufacturing, current assets are $325,400. Inventory is $60,400 of that total.

- Calculate 20X8 current liabilities. For Lloyd's Manufacturing, current liabilities are $101,600.

Calculate the 20X8 ratio.
Compare with Industry Averages and Related Information. Industry statistics indicate that the upper quartile of manufacturing firms in Lloyd's industry have an average Acid Test ratio of 2.7. The middle half have an acid test ratio of 1.0 and the lower quartile a ratio of .5. Again, Lloyd's 20X8 ratio of 2.61 appears to indicate that it is as financially secure as the most secure firms in its industry.

Total Liabilities to Net Worth Ratio Analysis. One way to improve the current and acid test ratios is long-term borrowing. For example, long-term borrowing could increase cash without increasing current liabilities. However, too much long-term borrowing could jeopardize the long-term survival of the firm. The Total Liabilities to Net Worth Ratio compares total liabilities to owner's equity as a source of funds. It provides insight into the firm's ability to cover debt and, if necessary, borrow additional funds.

\[
\text{Total Liabilities to Net Worth Ratio} = \frac{\text{Total Liabilities}}{\text{Tangible Net Worth}}
\]

For example: Using the data from the Lloyd's Manufacturing financial position presented above:
- Calculate 20X8 Total Liabilities. Total liabilities are the sum of current ($101,600) and long-term liabilities ($300,000). The sum is $401,600.
- Calculate 20X8 Net Worth. Net worth has already been calculated as $899,800.

Calculate the Ratio.

\[
\text{Total Liabilities to Net Worth Ratio} = \frac{\text{Total Liabilities}}{\text{Tangible Net Worth}} = \frac{401,600}{899,800} = .446
\]

Analysis of Ratios for Possible Trends. After you have calculated the appropriate ratios for the most recent year, examine data for earlier years for a possible trend. You should normally consider at least three years of data.

For example: Using the data from the Lloyd's Manufacturing financial position presented above:

<table>
<thead>
<tr>
<th>Lloyd's Manufacturing Financial Position</th>
<th>20X6</th>
<th>20X7</th>
<th>20X8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Assets to Current Liabilities</td>
<td>2.70</td>
<td>2.78</td>
<td>3.20</td>
</tr>
<tr>
<td>Acid Test</td>
<td>2.18</td>
<td>2.32</td>
<td>2.61</td>
</tr>
</tbody>
</table>
For Lloyd’s Manufacturing, analysis reveals that the Current Assets to Current Liabilities and the Acid Test Ratios have been improving over the last three years. Examination of the Total Liabilities to Net Worth Ratio does not reveal a trend.

Current and Projected Sales Analysis. The ratios above provide an insight into the firm's current financial status. Analysis of sales data for the current period and past two periods can provide insight into the circumstances affecting the firm's financial position. For example, as a firm increases sales, current liabilities may increase as the firm borrows money to finance additional inventories and accounts receivable. As sales decrease, inventories and material purchases may decrease reducing current assets and current liabilities.

In addition, the size of the proposed contract relative to current and recent sales provides insight into the firm's need for additional funds to support the proposed contract. For example, a firm proposing on a contract that is much larger than current annual sales would likely be a greater financial risk than a firm proposing on a contract that is only a small fraction of current sales.

Profit/Loss Statement Analysis. Profits are essential to a firm's long-term survival. Profits can be retained to finance operations. In addition, a profitable company is a more desirable investment for both potential owners and lenders. Continuing losses will lead to a deteriorating financial position and liabilities will likely increase relative to owner's equity to finance current operations. It will also become increasingly difficult for a firm to obtain additional funds because investors will be unwilling to invest in the firm and lenders less likely to loan money.

Working Capital Analysis. Net working capital is calculated by subtracting current liabilities from current assets. Working capital therefore represents assets funded by long-term debt and owner's equity, sources that do not require near-term repayment. The greater the working capital, the greater the assurance that short-term debts will be paid when due. A large amount of working capital (relative to the size of the contract) should increase the likelihood that the firm will be able to obtain any cash needed to finance contract operations. A small amount of working capital may raise serious questions about the firm's ability to obtain any additional funds necessary to complete the contract.

Credit Rating Analysis. Credit ratings are an important indicator of a firm's financial health. One of the first steps a struggling firm will take to remain in business is to delay paying its creditors. Credit ratings are available from a number of commercial services. Typically, these ratings use codes (e.g., "AAA" or "AA") to compare the financial strength of a company against the financial strength of all other companies rated.

To use a financial rating, you must consider several questions:
- What does the rating mean?
  - For example a rating of "A" may seem impressive, but it may mean that the firm's financial rating is only a little better than average for the firms rated.
  - How does the rating compare with the norm for the industry?
  - The rating systems are designed to compare the financial strength of firms across industries. However, various business factors may have depressed the credit ratings of all firms in a particular industry. In other words, a firm's rating could be weak compared with all industries, but relatively strong for a firm in its industry.
- How is the rating changing over time?
  - The current credit rating is a single evaluation at a particular point of time. Examine how the rating has changed over the past three years. Given the same current rating, a firm with a history of declining ratings is probably a greater risk than a firm with increasing ratings.

Business and Financial Reputation Analysis. Any other pertinent data that is uncovered in examining the firm's financial position should also be considered. Examples of additional data that may provide valuable insight include:
- Additional financial ratios highlighting information that is particularly relevant to firms in the industry
- Information indicating an anticipated loss on the proposed contract or other contracts.
- Information indicating a financial restructuring such as the sale or acquisition of facilities.
Analysis Conclusion. When you complete your analysis you must make a clear determination on contractor responsibility based on your findings:

- Responsible.
- Responsible with Government contract financing.
- Nonresponsible

For example: Examination of the three ratios above indicates that Lloyd's is in a strong financial position. All three ratios are better than the average firms in the industry. The Current Assets to Current Liabilities and the Acid Test Ratios have improved over the last three years. Unless other data about the firm revealed very negative information, it appears that Lloyd's is financially responsible.

9.4 Applying Financial Indicators To Contract Financing Decisions

This section examines some of the points that you should consider when evaluating the need to finance an acquisition.

- 9.4.1 - Commercial-Item Financing
- 9.4.2 - Noncommercial-Item Financing

Tailor Contract Financing (FAR 32.202-1(c)). Tailor contract financing to the product and contracting selection.

Over the years, the Government has developed financing practices to meet its unique needs in acquiring non-commercial items. These practices work well for noncommercial items, but do not always correspond with the practices used in commercial trade.

When Government financing is required for a commercial-item contract, carefully analyze current commercial-market practices. Study the contracting environment and commonly-used commercial methods of contract financing. Tailor contract financing based on the results of your analysis.

Commercial Item Identification (FAR 2.101). A commercial item is:

1. Any item, other than real property, that is of a type customarily used for nongovernmental purposes and that has been sold, leased, or licensed to the general public; or, offered for sale, lease, or license to the general public;
2. Performance that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;
3. Any item that would satisfy a criterion expressed in Paragraphs 1 or 2 of this definition, but for:
   - Modifications of a type customarily available in the commercial marketplace; or
   - Minor modifications of a type not customarily available in the commercial marketplace made to meet Government requirements. A "minor" modification is any modification that does not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or change the purpose of a process. When you determine whether a modification is minor consider the value and size of the modification and the comparative value and size of the final product. Use dollar values and percentages as guideposts, but they are not conclusive evidence that a modification is minor;
4. Any combination of items meeting the requirements of Paragraphs 1, 2, 3, or 5 of this definition that are of a type customarily combined and sold in combination to the general public;
5. Installation services, maintenance services, repair services, training services, and other services if such services are procured for support of an item referred to in Paragraphs 1, 2, 3, or 4 above, and if the source of such services:
   - Offers such services to the general public and the Government contemporaneously and under similar terms and conditions; and
   - Offers to use the same work force for providing the Government with such services as the source uses for providing such services to the general public;
6. Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed;
7. Any item, combination of items, or service referred to in Paragraphs 1 through 6, notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a contractor; or
8. A nondevelopmental item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local governments.

Nondevelopmental Item Identification (FAR 2.101). A nondevelopmental item is:
1. Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;
2. Any item described in Paragraph 1 of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or
3. Any item of supply being produced that does not meet the requirements of Paragraph 1 or 2 solely because the item is not yet in use.

9.4.1 Commercial-Item Financing

Commercial Financing Situations (FAR 32.202-1 and FAR 32.206(f)). For purchases of commercial supplies or services, financing is normally the contractor's responsibility. However, in some markets, buyers commonly finance commercial-item contracts. In these markets, the contracting officer may specify commercial financing terms in the solicitation or permit each offeror to propose its own financing terms. Only consider commercial-item contract financing when all of the following requirements are met:

- The contract item financed is a commercial supply or service.
- The contract price exceeds the simplified acquisition threshold.
- The contracting officer determines that financing is appropriate or customary in the commercial marketplace.
- The particular form of financing under consideration is in the best interest of the Government.
- Adequate financial security is obtained.
- Aggregate commercial advance payments will not exceed 15 percent of the contract price.
- The contract is awarded competitively, or if only one offer is solicited, adequate consideration is obtained if the financing is expected to be substantially more advantageous to the offeror than the offeror's normal method or customer financing.
- The payment office concurs with the contract liquidation provisions.
  - Liquidation of contract financing payments must be made on the same basis as the computation of financing payments (e.g., financing payment computed on a whole contract basis must be liquidated on a whole contract basis, financing payment computed on a line item basis must be liquidated against that line item).
  - Liquidation on a whole contract basis must use a uniform liquidation percentage as the liquidation method, unless:
    - The cognizant payment office agrees that proposed liquidation provisions can be executed by that office, or
    - Agency regulations provide alternative liquidation methods.

Types of Commercial Payments (FAR 32.202-2 and FAR 32.206(g)). There are four types of payments for commercial-item purchases:

- Commercial Advance Payments. These payments:
  - Are made before there is any performance of work under the contract.
  - In aggregate, must not exceed 15 percent of the contract price.
- Are contract financing for prompt payment purposes (e.g., not subject to interest payments under the Prompt Payment Act).
- Are not subject to FAR requirements related to advance payments for noncommercial items.

- Commercial Interim Payments. These payments:
  - Are made after some work has been accomplished but before final delivery and acceptance.
  - Are contract financing for prompt payment purposes (e.g., not subject to interest payments under the Prompt Payment Act).
  - May be made:
    - Based on the achievement or occurrence of specified events,
    - Based on the passage of time, or
    - At specified times prior to delivery dates.

- Installment Payments. This form of financing is payment to a contractor of a fixed number or equal interim financing payments prior to delivery and acceptance of a contract item.
  - The installment payment arrangement is designed to reduce administrative costs.
  - However, if a contract will have a large number of deliveries, the administrative costs may increase to the point where installment payments are not in the best interest of the Government.
  - The sum of all installment payments must not exceed 70 percent of the price of the unit(s) financed.

- Delivery Payment. This is payment for accepted supplies or services (including partial deliveries). Financing payments (advance, interim, or installment) are liquidated by deducting the amounts previously paid for an item from the item delivery payment.

Market Research on Commercial Financing (FAR 32.202-3). If you are considering the use of commercial financing, make commercial financing a part of your market research. Consider:
- The extent to which other buyers provide contract financing for products in the market involved;
- The overall level of financing normally provided;
- The amount or percentages of any payments equivalent to commercial advance payments,
- The basis for any payments equivalent to interim payments, as well as the frequency, and amounts or percentages; and
- Methods of contract financing payment liquidation and any special or unusual payment terms applicable to delivery payments.

Security for Commercial Financing (FAR 32.202-4). By law, you must obtain adequate security for Government financing. Accordingly, you must specify acceptable types of security in the solicitation. If more than one type of security is acceptable, require each offeror to specify the security that it will provide and assure that security is identified in the final contract.
- Require security that is at least equivalent to the maximum unliquidated amount of contract financing payments to be made to the contractor. The contracting officer may adjust the required security value periodically during contract performance, as long as it is always equal to or greater than the amount of unliquidated financing.
- Consider the offeror's financial condition as security. Subject to agency regulations, the contracting officer may determine that the offeror's financial condition is adequate security, provided the offeror agrees to provide additional security should its financial condition become inadequate security.
- Consider both net worth and liquidity in assessing the offeror's financial condition.
- Require additional security if the offeror's financial condition is not adequate security.

- Consider other types of security including the following:
  - Paramount lien. A lien is the legal claim by one person (in this case the Government) over the property of another for the payment of a debt or the settlement of an obligation.
  - Statutes specify that any liens provided as security for Government financing are paramount over all other liens in effect over contractor property. This right is effective with the first payment to the contractor, and requires no filing, notice, or other action by the Government.
  - The contract must specify what assets are subject to the lien (e.g., work in progress, the plant, inventory), and give the Government the right to verify the existence and value of those assets.
  - Financing must be conditioned upon a contractor certification that the assets subject to the lien are free from any prior encumbrances.
  - United States bonds or notes.
  - Currency, certified or cashier's checks, bank drafts, or money orders.
  - Irrevocable letter of credit.
  - A bond from a surety.
  - A guarantee of repayment from a person or corporation of demonstrated liquid net worth, connected by significant ownership to the contractor.
  - Title to identified contractor assets of adequate worth.

- Consider the risks associated with requiring security.
  - Identify the risks to the Government of providing very high amounts of Government financing early in the contract (front-end loading).
  - Analyze security requirements and the amounts and timing of financing payments to determine whether a particular financing arrangement is in the Government's best interest.

Contracting Officer- Specified Commercial Contract Financing (FAR 32.203 and FAR 32.204). When market research provides sufficient information to identify the customary financing terms in the relevant industry, you may specify the appropriate terms in the solicitation. If you do:

- Assure that contract financing is not used as a factor to evaluate competing offers for contract award.
- Assure that no proposal offering alternative financing is accepted.
- Do not permit an offeror's decision not to use Government-specified financing to alter the Government's evaluation of the offer. That decision does not render the offer nonresponsive or otherwise unacceptable.
- If you make award to an offeror that declined the Government-specified financing, assure that contract financing provisions are not included in the resulting contract.
- Do not accept contract financing as a basis for adjusting an offeror's proposed prices, because the effect of contract financing is reflected in each offeror's prices.

Offeror-Proposed Commercial Contract Financing (FAR 32.205 and OMB Circular A-94). Market research may permit the contracting officer to determine that commercial-item financing is appropriate, but not which financing terms are in the best interest of the Government. In this situation, the solicitation should permit each offeror to propose financing terms. The contracting officer must then determine which offer is
in the best interests of the Government. If you take this approach:

- Assure that the solicitation
  - Includes the FAR provision, Invitation to Propose Financing Terms.
  - Specifies the delivery payment (invoice) dates and interest rate that will be used in financing proposal evaluation.

- Evaluate the total cost to the Government for each proposal by adjusting each proposed price to reflect the costs of providing the proposed financing. For each financing payment:
  - The amount financed is the proposed financing payment under the offeror's proposal.
  - The financing period is the time (in years) between the date of the proposed financing payment and the date that the amount would be paid as a delivery payment.
  - The interest rate is the Nominal Discount Rate identified in Appendix C of OMB Circular A-94, Benefit-Cost Analysis of Federal Programs; Guidelines and Discounts.

9.4.2 Noncommercial-Item Financing
General Policy on Providing Noncommercial Item Financing (FAR 32.104(a)). Prudent noncommercial-item contract financing can be a useful tool for Government acquisition, but you must limit the use of this tool to situations where it is needed for prompt and efficient contract performance. When used:

- Administer it in a way that aids the acquisition.
- Avoid any undue risk of Government monetary loss.
- Monitor the contractor's use of the financing provided.

Dollar Limitations on Noncommercial Item Financing (FAR 32.104(d)). Consider contract financing for contracts with:

- Small business concerns, when the contract price will be greater than the simplified acquisition threshold, or
- Other than small business concerns, when:
  - The contract price will be $1 million or more, or
  - A group of contracts, whose prices are greater than the simplified acquisition threshold, total $1 million or more.

Need for Contract Financing Not a Deterrent (FAR 32.107). If the contractor or offeror meets the standards prescribed for contractor responsibility, never allow the contractor's need for contract financing to affect the contract award decision (e.g., as a responsibility factor or evaluation criterion.). After award, you should not disqualify a contractor from contract financing solely because the contractor failed to indicate a need for contract financing before contract award.

Uses of Noncommercial Contract Financing (FAR 32.105). Noncommercial contract financing methods are intended to be self-liquidating through contract performance. Accordingly, you must normally limit their use to financing contractor working capital and not for financing expansion of contractor-owned facilities or the acquisition of fixed assets. However, under loan guarantees, exceptions can be made for:

- Facilities expansion of a minor or incidental nature, if a relatively small part of the guaranteed loan is used for the expansion and the contractor's repayment would not be delayed or impaired; or
- Other instances of facilities expansion for which contract financing is appropriate under agency procedures.

Order of Financing Preference (FAR 32.102, FAR 32.106, and FAR 32.113). When a contractor requests contract financing, consider the following order of preference (unless an exception would be in the Government's best interest):

- Private financing without Government guarantee. However, you should not require the contractor to obtain private financing at unreasonable terms or from other agencies.
- Partial payments;
- Customary contract financing, including:
  - Progress payments based on the percentage or stage of completion;
  - Performance-based payments; or
  - Customary progress payments based on costs.
- Loan guarantees.
- Unusual contract financing -- any contract financing arrangement that deviates from those found in the FAR -- including unusual progress payments based on costs. Use of unusual contract financing must be approved by the head of the agency or as provided for in agency regulations.

**Advance Payments**

Partial Payments (FAR 32.102(d), FAR 32.903(f)(2), and OMB Prompt Payment Regulations at 5 CFR 1315). OMB Prompt Payment regulations require agencies to pay for partial delivery of supplies or partial performance of services unless specifically prohibited by the contract. Although partial payments are generally treated as a method of payment, not a method of contract financing, using partial payments can assist contractors to participate in Government contracts without, or with minimal, contract financing.

- When appropriate, design contract statements of work and pricing arrangements to permit acceptance and payment for discrete portions of work, as soon as it is accepted.
- Unless specifically prohibited by the contract, the contractor is entitled to payment for accepted partial deliveries of supplies or partial performance of services that comply with all applicable contract requirements and for which prices can be calculated from the contract terms.

**Progress Payments Based on Percentage or Stage of Completion** (FAR 32.102(e), FAR 52.232-5, and DFARS 232.102(e)(2)).

You may use progress payments based on the percentage or stage of contract completion following agency procedures. The most common application of this financing method is construction. However, IAW FAR 32.500(b), FAR 32.5 is not applicable when using Progress Payments Based on Percentage or Stage of Completion. Other applications include: shipbuilding and ship conversion, alteration, or repair. Under construction contracts:

- Progress payments are typically made monthly as work proceeds, based on estimates of work accomplished which meets the standards of quality established in the contract. When satisfactory progress has not been achieved by a contractor during any period for which a progress payment is to be made, a percentage of the progress payment may be retained. Retainage should not be used as a substitute for good contract management, and the contracting officer should not withhold funds without cause. Determinations to retain and the specific amount to be withheld shall be made by the contracting officers on a case-by-case basis. Such decisions will be based on the contracting officer’s assessment of past performance and the likelihood that such performance will continue. The amount of retainage withheld shall not exceed 10 percent of the approved estimated amount in accordance with the terms of the contract and may be adjusted as the contract approaches completion to recognize better than expected performance, the ability to rely on alternative safeguards, and other factors. Upon completion of all contract requirements, retained amounts shall be paid promptly.
- On completion and acceptance of each separate building, public work, or other separately-priced division of the contract, payment must be made for the completed work without retention of a percentage.

**Customary Progress Payments Based on Costs** (FAR 32.501-1, FAR 32.502-1, FAR 32.502-2, and DFARS 232.501-1).

Customary progress payments are those made using the customary progress payment rate, cost base, and frequency of payment established in the FAR Progress Payments clause. Any other progress payments are considered unusual.

The current FAR customary progress payment rate is 80%, applicable to the total cost of performing the
contract. For small business concerns, the rate is 85%. Rates vary from time to time and from agency to agency. For example, the DoD has established customary rates for DoD contracts at 80% for large businesses, 90% for small businesses and 95% for small disadvantaged businesses. Unless otherwise authorized by agency procedures, the contracting officer may provide contract financing in the form of performance-based payments or customary progress payments if the following conditions are met:

- The contractor:
  - The contractor will not be able to bill for the first delivery of products, or other performance milestones, for a substantial time after work must begin (normally four months or more for a small business; six months or more for others) and
  - The contractor will make expenditures for contract performance during the predelivery period that have a significant impact on the contractor's working capital; and
  - The contractor (particularly if the contractor is a small supplier) demonstrates actual financial need or unavailability of private financing.
- The contracting officer:
  - May provide for progress payments for contracts of less than $1,000,000 if the following conditions exist:
    - The contractor is a small business and the contract will be equal to or greater than the simplified acquisition threshold;
    - The contractor will perform a group of small contracts at the same time and the total impact on working capital is equivalent to a single contract of $1,000,000 or more;
    - Agency regulations provide for such progress payments.

The contracting officer must decide whether to provide for progress payments when a series of orders are awarded (e.g., under an indefinite delivery contract), based on:

- An estimate of the total work to be done (per FAR 32.503-5(c) the administration of progress payments under each order is a separate contract), and
- The probable impact on working capital of the predelivery expenditures and production lead times of the majority of the individual orders.
- Must obtain contract finance office or other agency-designated approval before providing progress payments to a contractor:
  - Whose financial condition is in doubt;
  - Who has had an advance payment request or loan guarantee denied (or approved but withdrawn or lapsed) within the previous 12 months; or
  - Who is named in the consolidated list of contractors indebted to the United States (the "Hold-Up List").

Performance-Based Payments (FAR 32.102(f), FAR 32.1000, FAR 32.1001, FAR 32.1002, FAR 32.1003, and FAR 32.1004).

Performance-based payments are noncommercial contract financing based on contractor achievement of performance goals established in the contract. They are the preferred financing method, when the contracting officer finds them practical and the contractor agrees to use them.

The contracting officer:

- Must not apply performance-based payment to cost-reimbursement contracts.
- Must not apply performance-based payment to contracts:
  - For architect-engineer services or construction;
  - For shipbuilding or ship conversion, alteration, or repair, when the contracts provide for
progress payments based upon a percentage or stage of completion;

- For research and development;
- Awarded through sealed bidding or competitive negotiation;

- Must assure that the following conditions are met before using performance-based payments:
  - The contracting officer and the offeror agree on the performance-based payment terms.
  - The contract is a definitized fixed-price contract. However, an undefinitized contract may include the FAR Performance-Based clause with the provision that the clause is not effective until the contract is definitized and the performance-based schedule is included in the contract.
  - The contract does not provide for other methods of contract financing, except advance payments or guaranteed loans.

- May provide for payments based on any of the following:
  - Performance measured by objective and quantifiable methods,
  - Accomplishment of defined events, or
  - Other quantifiable measures of results.

- May provide for performance-based payments to be made on a:
  - Whole contract, or
  - Deliverable line item (e.g., a single line item with 10 units priced at $1,000,000 each has 10 deliverable items, but a line item for a lot of 10 units priced at $10,000,000 has one deliverable item -- the lot).

- May base performance-based payments on either specifically described events (e.g., milestones) or some measurable performance criterion.
  - Each event or performance criterion used to trigger a finance payment:
    - Must be an integral and necessary part of contract performance, and
    - Must be identified in the contract, along with a description of what constitutes successful performance of the event or attainment of the performance criterion.
    - The signing of contracts or modifications, the exercise of options, or other such action must not be events or criteria for performance-based payments.
    - An event need not be a critical event in order to trigger a payment, but successful performance of each identified event or performance criterion must be readily verifiable.
    - Events or criterion may be either severable or cumulative:
      - The successful completion of a severable event or criterion is independent of the accomplishment of any other event or criterion.
      - The successful completion of a cumulative event or criterion is dependent upon the previous accomplishment of another event.

- Must assure that the contract:
  - Does not permit payment for a cumulative event or criterion until each dependent event or criterion has been successfully completed.
  - Specifically identifies severable events or performance criterion that will trigger payments.
  - Identifies which events or criteria are preconditions for the successful achievement of each cumulative event or criterion.
When performance-based payments are made on a deliverable item basis, identifies trigger events or performance criteria that are:

- Part of the performance necessary for that item, and
- Specifically identified with that item or subline item.
- Identifies the dollar payment (or percentage of contract/item price) associated with each trigger event or criterion. Amounts may be established on any rational basis, including:
  - Engineering estimates of stages of completion;
  - Engineering estimates of hours or other measures of effort to be expended in performance of an event or achievement of a performance criterion; or
  - The estimated cost of performance of particular events.
- Does not provide for performance-based payments exceeding:
  - 90 percent of contract price if payments are based on the whole contract, or
  - 90 percent of the delivery item price if payments are based on delivery items.
- Specifies a liquidation rate or dollar amount for the delivery item or whole contract depending on which is used for performance-based payments.

Loan Guarantees for Defense Production (FAR 32.302, FAR 32.303, FAR 32.304-1, and FAR 32.304-2).

A guaranteed loan is a loan, revolving credit fund, or other financial arrangement made pursuant to Regulation V of the Federal Reserve Board. Under this regulation, the guaranteeing agency is obligated, on demand of the lender, to purchase a stated percentage of the loan and to share any losses in the amount of the guaranteed percentage. The guaranteeing agency is any agency that the President has authorized to guarantee loans, through Federal Reserve Banks, to expedite national defense production. These include: the Departments of Defense, Energy, Commerce, Interior, Agriculture; the General Services Administration; and the National Aeronautics and Space Administration.

- The process begins with the guaranteed loan application:
  - A contractor, subcontractor, or supplier that needs operating funds to perform a contract related to national defense may apply to a financing institution for a loan.
  - If the financing institution is willing to extend credit, but considers a Government guarantee necessary, the institution may apply to the Federal Reserve Bank of its district for the guarantee.
  - The Federal Reserve Bank will:
    - Send a copy of the application to the Federal Reserve Board and the Board will transmit the application and a list of related contracts to the interested guaranteeing agency to assist in determining the eligibility of the contractor.
    - While eligibility is being determined, make any necessary credit investigation in order to expedite necessary defense financing and protect the Government against monetary loss.
    - Send the results of the credit investigation and its recommendation to the Federal Reserve Board and the Board will transmit them to the interested guaranteeing agency.

- The contracting officer must:
  - Prepare a certificate of eligibility for a contract that the contracting officer believes to be of material consequence when:
    - The agency contract financing office requests it.
    - Another interested agency requests it.
    - The application for a loan guarantee relates to a contract or subcontract within the
contracting officer's cognizance.

- Assure that the certificate of eligibility includes the following determinations:
  - The supplies or services to be acquired are essential to the national defense.
  - The contractor has the facilities and the technical and management ability required for contract performance.
  - There is no practicable alternate source for the acquisition without prejudice to the national defense. (Never include this statement if the firm is a small business.) In making this determination, consider the factors identified in the FAR.
  - Must attach sufficient data to support the determination, including:
    - The contractor's past performance;
    - The relationship of the contractor's operations to performance schedules; and
    - Other appropriate factors.

- The guaranteeing agency must:
  - Evaluate the relevant data, including:
    - The certificate of eligibility,
    - The accompanying data, and
    - Any other relevant information on the contractor's financial status and performance.
  - Determine whether authorization of a loan guarantee would be in the Government's interest.
  - Complete a standard form of authorization as prescribed by the Federal Reserve Board, if
    - A loan guarantee is found to be in the Government's interest, and
    - The terms and conditions of the proposed guarantee are considered appropriate.
  - Assure that the guarantee is less than 100 percent of the loan, unless the agency determines that all of the following conditions exist:
    - The circumstances are exceptional.
    - The operations of the contractor are vital to the national defense.
    - No other means of financing are available.
    - Normally limit guarantees made primarily for working capital purposes, using an asset formula, to a specified percentage (usually 90 percent or less) of the contractor's investment.
    - Transmit the authorization through the Federal Reserve Board to the Federal Reserve Bank.

- The Bank is authorized to execute and deliver to the financing institution a guarantee agreement.
- The financing institution will then make the loan.

Unusual Progress Payments Based on Costs (FAR 32.501-2 and FAR 32.502-2). Progress payments may be customary or unusual. Customary progress payments are those made under the general guidance in FAR 32.501 using the customary progress payment rate, the cost base, and frequency of payment established in the Progress Payments clause, and either the ordinary liquidation method or the alternate method as provided in FAR 32.503-8 and 32.503-9. Any other progress payments are considered unusual, and may be used only in exceptional cases when authorized in accordance with FAR 32.501-2.
When considering the use of progress payments with unusual terms, the contracting officer:

- May only provide such progress payments if the following conditions are met:
  - The contract necessitates predelivery expenditures that are large in relation to contract price and in relation to the contractor's working capital and credit.
  - The contractor fully documents an actual need to supplement any private financing available, including guaranteed loans.
  - The contractor's request is approved by the head of the contracting activity or a designee.

- Must obtain contract finance office or other agency-designated approval before taking any of the following actions:
  - Providing a progress payment rate higher than the customary rate;
  - Deviating from the progress payment terms prescribed in the FAR; or
  - Providing progress payments to a contractor:
    - Whose financial condition is in doubt;
    - Who has had an advance payment request or loan guarantee denied (or approved but withdrawn or lapsed) within the previous 12 months;
    - Who is named in the consolidated list of contractors indebted to the United States (the "Hold-Up List").

- Should assure that the difference between the unusual progress payment rate and the customary rate is the smallest difference possible under the circumstances.

- Should not consider progress payment terms unusual merely because they are being used on a letter contract or a definitive contract that superseded a letter contract.

Advance Payments for Noncommercial Items (FAR 32.402, FAR 32.403, FAR 32.404, FAR 32.408, FAR 32.409-1, and FAR 32.409-2).

Advance payments for noncommercial items may be authorized for any type of contract, however they are generally the least preferred method of contract financing and should not be authorized if other types of financing are reasonably available. Loans and credit at excessive interest rates or other exorbitant charges are not considered reasonably available financing.

- You are authorized by law to make advance payments for the following items and the general preference against advance payments does not apply:
  - Rent;
  - Tuition;
  - Insurance premiums;
  - Expenses of investigations in foreign countries;
  - Extension or connection of public utilities for Government buildings or installations;
  - Subscriptions to publications;
  - Purchases of supplies and services in foreign countries, if:
    - The purchase price does not exceed $10,000; and
    - The advance payment is required by the laws or government regulations of the foreign country concerned;
    - Enforcement of the customs or narcotics laws; or
    - Other transactions authorized by agency procedures under statutory authority.
• You may also find advance payments useful and appropriate for the following:
  o Contracts for experimental, research, or development work with nonprofit educational or research institutions;
  o Contracts solely for the management and operation of Government-owned plants;
  o Contracts for acquisition at cost of facilities for Government ownership;
  o Contracts of such highly classified nature that the agency considers it undesirable for national security to permit assignment of claims under the contract;
  o Contracts entered into with financially weak contractors whose technical ability is considered essential to the agency;
  o Contracts for which a loan by a private financial institution is not practicable, whether or not a loan guarantee is issued.
  o Contracts with small business concerns under circumstances which make advance payments appropriate.
  o Contracts under which exceptional circumstances make advance payments the most advantageous contract financing method for both Government and the contractor.

• A contractor may apply for advance payments before or after contract award. The contractor must submit any advance payment request to the contracting officer and generally must provide the information below. (Specific requirements may vary for experimental, research, or development contracts with nonprofit educational or research institutions or management and operation contracts for Government-owned plants.)
  o Reference to the contract or solicitation for which advance payment is requested.
  o A cash flow forecast showing estimated disbursements and receipts for the period of contract performance.
  o The proposed total amount of the advance payments.
  o The name and address of the bank at which the contractor expects to establish a special account as a depository for the advance payments.
  o A description of the contractor's efforts to obtain unguaranteed private financing of a guaranteed loan.
  o Other information appropriate to an understanding of the:
    o Contractor's financial condition and need;
    o Contractor's ability to perform the contract without loss to the Government; and
    o Financial safeguards to protect the Government's interest.

• After analysis of the contractor's request, the contracting officer must provide a recommendation to the agency's approving authority.
  o For both approval and disapproval you must transmit the following:
    o Contract related data;
    o The contractor's request and supporting information;
    o A report of the contractor's past performance, responsibility, technical ability, and plant capacity.
  o For a disapproval recommendation, provide the reason for that decision.
  o For an approval recommendation, provide:
    o Comments on the contractor's need for advance payments and potential Government
benefits from contract performance;

- Proposed advance payment contract terms, including proposed security requirements.
- The findings, determination, and authorization following the FAR-required format.
- A recommendation for approval of the request.
- Justification for any proposal for waiver of interest charges.

9.5 Applying Financial Indicators To Performance Bond Decisions
Performance Bond (FAR 28.001). A performance bond is a written instrument executed by the contractor (the principal) and a second party (the surety or sureties) to assure fulfillment of the contractor's obligations under the contract. If the contractor's obligations are not met, the bond assures payment, to the extent stipulated, of any loss sustained by the Government.

Requirement for Construction Contracts (FAR 13.005(a)(2), FAR 28.102-1, FAR 28.204-1, and FAR 28.204-2).
The Miller Act requires the Government to obtain a performance bond for any construction contract exceeding the simplified acquisition threshold, except that the requirement may be waived:

- By the contracting officer for work performed in a foreign country upon finding that it is impracticable for the contractor to furnish a performance bond, or
- As otherwise authorized by law.

For construction contracts greater than $25,000 but not greater than the simplified acquisition threshold, you must provide contractors two or more of the payment protection alternatives outlined below. The contractor may then select from the alternatives.

- Payment bond.
- An irrevocable letter of credit (ILC). The FAR requires that you give particular consideration to including this as one of the alternatives.
- A tripartite escrow agreement.
  - The prime contractor establishes an escrow account in a Federally insured financial institution and enters into a tripartite escrow agreement with:
    - The financial institution, as escrow agent, and
    - All of the labor and material suppliers.
    - The escrow agreement establishes the terms of payment under the contract and of resolution of disputes among the parties.
    - The Government makes payments to the contractor's escrow account, and the escrow agent distributes the payments in accordance with the agreement, or triggers the disputes resolution procedures if required.
- Certificates of deposit. The contractor deposits certificates of deposit from a Federally-insured financial institution with the contracting officer.
- Security deposit in the form of:
  - United States bonds or notes in an amount equal to the amount of the contract; or
  - Certified or cashier's check, bank draft, Post Office money order, or currency in the amount of the contract.

Requirement for Other Contracts (FAR 28.103-1 and FAR 28.103-2). Generally, you must not require performance bonds for contracts other than construction contracts. However, you may require performance bonds for contracts exceeding the simplified acquisition threshold when necessary to protect the Government's interest. The following situations may warrant a performance bond:

- Government property or funds are to be provided to the contractor for use in performing the contract or as partial compensation
A contractor sells assets to or merges with another concern, and the Government, after recognizing the latter concern as successor in interest, desires to assure that it is financially capable.

Substantial progress payments are made before delivery of end item starts.

Contracts for dismantling, demolition, or removal of improvements.

Contractor Financial Responsibility (FAR 28.103-2(c)). Concerns about contractor financial responsibility may affect your decision on whether or not to require a performance bond. However, you must remember that requiring a performance bond does not relieve you from the requirement to assure that a prospective contractor is responsible before making contract award. Also remember, that you must never assume that a contractor is financially responsible, simply because the firm can obtain a performance bond.

Bond Amount (FAR 28.102-2). When the contract requires a performance bond:

- The original penal amount of the bond must be 100 percent of the original contract price, unless the contracting officer determines that a lesser amount will protect the Government's interest.

- You may require additional performance bond protection when a contract price is increased.
  - The increase in protection generally must equal 100 percent of the increase in contract price.
  - Secure the additional protection by directing the contractor to increase the penal amount of the existing bond or by obtaining an additional bond.

9.6 Applying Financial Indicators To Progress Payment Administration

This section examines some of the points that you should consider in progress payment administration.

9.6.1 - Government Rights In Adjustment Situations

9.6.2 - Adjustment For Loss Contracts

9.6.3 - Liquidation Rate Adjustment

9.6.1 Government Rights In Adjustment Situations

Government Right to Adjust Progress Payments (FAR 32.503-6 and FAR 52.232-16). The FAR Progress Payments clause provides the Government the right to reduce or suspend progress payments, or to increase the liquidation rate, under specific conditions. Only take action:

- In accordance with the contract terms and never precipitately or arbitrarily.

After:

- Notifying the contractor of the intended action and providing an opportunity for discussion.

- Evaluating the effect of the action on the contractor's operations. In your evaluation, consider the contractor's financial condition, projected cash requirements, and existing or available credit arrangements.

- Considering the general equities of the particular situation.

- Immediately and unilaterally if warranted by circumstances such as overpayments or unsatisfactory contract performance.

- Fairly and reasonably.
  - Base your decisions on substantial evidence.
  - Document the contract file.
  - Findings supporting the need for the change must be in writing.

Adjustment Situations (FAR 32.503-6 and 52.232-16(c)). You may reduce or suspend progress payments, increase the liquidation rate, or take a combination of these actions, after finding on substantial
evidence any of the conditions outlined in the table below.

<table>
<thead>
<tr>
<th>Situation</th>
<th>If...</th>
<th>Then...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Noncompliance</td>
<td>The contractor's accounting system or controls are deemed inadequate</td>
<td>Suspend progress payments or suspend the progress payments associated with the unacceptable portion of the accounting system until necessary changes are made.</td>
</tr>
<tr>
<td></td>
<td>The contractor fails to comply with contract requirements without fault or negligence</td>
<td>Take no action other than to correct overpayments and collect amounts due from the contractor.</td>
</tr>
<tr>
<td>Unsatisfactory Financial Condition</td>
<td>The contracting officer finds that contract performance (including liquidation of progress payments) is endangered by the contractor's financial condition, or by a failure to make progress</td>
<td>Require the contractor to make additional operating or financial arrangements adequate for completing the contract without loss to the Government.</td>
</tr>
<tr>
<td></td>
<td>The contracting officer concludes that further progress payments would increase the probable loss to the Government</td>
<td>Suspend progress payments and all other payments until the unliquidated balance of progress payments is eliminated.</td>
</tr>
</tbody>
</table>
| Excessive Inventory            | The inventory allocated to the contract exceeds reasonable requirements (including a reasonable accumulation of inventory for continuing operations) | Require the transfer of excessive inventory from the contract and take one or more of the following actions:  
  • Eliminate the costs of excessive inventory from the costs of eligible progress payments, with appropriate reduction in progress payments outstanding.  
  • Apply additional deductions to billings for deliveries (increase liquidation). |
| Delinquency in Payment of Performance Costs | The contractor is delinquent in paying the costs of contract performance in the ordinary course of business | Evaluate whether the delinquency is caused by an unsatisfactory financial condition.  
  • If it is, see Unsatisfactory Financial Condition above.  
  • If it is not, do not deny progress payments if the contractor agrees to: |
| Fair Value of Undelivered Work | The unliquidated progress payments exceed the fair value of undelivered work | Take appropriate action, considering the:
- Degree of contract completion.
- Quality and amount of work performed on the undelivered portion of the contract.
- Amount of work remaining to be done and the estimated cost of completion.
- Amount remaining unpaid under the contract. |
| Loss Contracts | The total costs incurred under the contract plus the estimated cost to complete are likely to exceed the contract price | Compute a loss ratio factor and adjust future progress payments to exclude the element of loss. |

9.6.2 Adjustment For Loss Contracts

Supplementary Analysis for Loss Contracts (FAR 32.503-6(g)). Whenever you receive a Contractor Request for Progress Payment, carefully review the figures provided by the contractor. In particular, review Items 5, 12a, and 12b. If the sum of the total costs incurred to date under the contract (SF 1443, Item 12a) plus the estimated additional cost to complete the contract (SF 1443, Item 12b) exceed the contract price (SF 1443, Item 5), perform a supplementary analysis of the progress payment request. The purpose of the supplementary analysis is to exclude the estimated loss from future progress payments. In your analysis, use the procedure outlined in the following example:
### Supplementary Progress Payment Analysis

#### Section I -- Calculate Revised Contract Price

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract price (SF 1443, Item 5)</td>
<td>$950,000</td>
</tr>
<tr>
<td>Pending change orders and unpriced orders (to extent fund obligated)</td>
<td>+ $70,000</td>
</tr>
<tr>
<td>Revised contract price (including change orders and unpriced orders)</td>
<td>$1,020,000</td>
</tr>
</tbody>
</table>

#### Section II -- Calculate Alternate Amount To Be Used For Progress Payments

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total costs incurred to date (SF 1443, Item 12a)</td>
<td>$900,000</td>
</tr>
<tr>
<td></td>
<td>Add estimated additional cost to complete the contract</td>
<td>+ $300,000</td>
</tr>
<tr>
<td></td>
<td>Total cost to complete</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>2</td>
<td>Calculate loss ratio factor = ( \frac{\text{Revised Contract Price}}{\text{Total Cost to Complete}} )</td>
<td>( \frac{$1,020,000}{$1,200,000} )</td>
</tr>
<tr>
<td>3</td>
<td>Total costs eligible for progress payments (SF 1443, Item 11) (Note that this figure assumes that all incurred costs are eligible)</td>
<td>$900,000</td>
</tr>
<tr>
<td></td>
<td>Multiply total costs eligible by the loss ratio factor</td>
<td>x 85.0%</td>
</tr>
<tr>
<td></td>
<td>Recognized costs for progress payments (replaces total costs eligible for progress payments in progress payment calculations)</td>
<td>$765,000</td>
</tr>
<tr>
<td>4</td>
<td>Multiply recognized costs by the progress payment rate</td>
<td>x 80.0%</td>
</tr>
<tr>
<td></td>
<td>Alternate amount to be used for progress payments</td>
<td>$612,000</td>
</tr>
</tbody>
</table>

#### Section III -- Calculate Recognized Costs Applicable To Undelivered Items

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factored costs of items delivered (same as contract price of items delivered)</td>
<td>$250,000</td>
</tr>
<tr>
<td>Recognized costs applicable to undelivered items ($765,000 - $250,000)</td>
<td>$515,000</td>
</tr>
</tbody>
</table>

The following comparison demonstrates how the summary analysis will affect the amount due the contractor under progress payments.

<table>
<thead>
<tr>
<th>Comparison Before And After Supplementary Analysis</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor Proposed</td>
<td>Supplementary Analysis</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Total cost eligible for progress payments</td>
<td>$900,000</td>
</tr>
<tr>
<td>Progress payment rate</td>
<td>80.0%</td>
</tr>
<tr>
<td>Total amount eligible for progress payment</td>
<td>$720,000</td>
</tr>
<tr>
<td>Less previous progress payments</td>
<td>- $500,000</td>
</tr>
<tr>
<td>Maximum balance eligible for progress payment</td>
<td>$220,000</td>
</tr>
</tbody>
</table>

**9.6.3 Liquidation Rate Adjustment**

Progress Payment Liquidation ([FAR 32.503-8](https://www.govinfo.gov/content/pkg/CFR-2018-title41-vol1/pdf/CFR-2018-title41-vol1.html) and [FAR 32.503-9](https://www.govinfo.gov/content/pkg/CFR-2018-title41-vol1/pdf/CFR-2018-title41-vol1.html)). The Government recoups progress payments through the deduction of liquidations from payments that would otherwise be due to the contractor for completed work. To determine the liquidation amount, you must apply a liquidation rate to the contract price of contract items delivered and accepted. This section will examine both the ordinary and alternate methods of liquidation rate application.

**Ordinary Method of Liquidation ([FAR 32.503-8](https://www.govinfo.gov/content/pkg/CFR-2018-title41-vol1/pdf/CFR-2018-title41-vol1.html)).** Under the ordinary method the liquidation rate is the same as the progress payment rate. This is the only method that you may use at the beginning of a contract.

For Example: Suppose that you have an $11 million dollar firm fixed-price contract with four line items priced at $2.75 million each. The table below depicts the ordinary method of progress payment liquidation throughout the contract when the progress payment and liquidation rates are both 80 percent. In this example, estimated cost is $10 million and actual cost is equal to estimated cost.

**Progress Payment Liquidation**

<table>
<thead>
<tr>
<th>Month</th>
<th>Monthly Contract Cost</th>
<th>Progress Payment Rate</th>
<th>Monthly Progress Payments</th>
<th>Price Of Items Delivered</th>
<th>Liquidation Rate</th>
<th>Progress Payment Liquidation</th>
<th>Price Of Delivered Items Less Liquidation</th>
<th>Total Paid</th>
<th>Unliquidated Progress Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$100,000</td>
<td>80.0%</td>
<td>$80,000</td>
<td>80.0%</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$80,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>2</td>
<td>$250,000</td>
<td>80.0%</td>
<td>$200,000</td>
<td>80.0%</td>
<td>$0</td>
<td>$0</td>
<td>$280,000</td>
<td>$280,000</td>
<td>$0</td>
</tr>
<tr>
<td>3</td>
<td>$250,000</td>
<td>80.0%</td>
<td>$200,000</td>
<td>80.0%</td>
<td>$0</td>
<td>$0</td>
<td>$480,000</td>
<td>$480,000</td>
<td>$0</td>
</tr>
<tr>
<td>4</td>
<td>$400,000</td>
<td>80.0%</td>
<td>$320,000</td>
<td>80.0%</td>
<td>$0</td>
<td>$0</td>
<td>$800,000</td>
<td>$800,000</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
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* Remaining unliquidated progress payments.

Limitation on G&A Expense for Progress Payments (Appendix A, 9904.410). A firm not subject to Cost Accounting Standards Board Cost Accounting Standards (CAS) may use cost of sales as a base for allocation of general and administrative (G&A) expense. A firm subject to full CAS coverage must comply with CAS 410, Allocation of Business Unit General and Administrative Expenses to Final Cost Objectives. That Standard requires the contractor to allocate G&A using a cost input allocation base (e.g., cost of goods manufactured).

- **CAS 410 Appendix A** describes use of an inventory suspense account to transition from a cost of sales allocation base to a cost input allocation base. In this account:
  - G&A for new contracts is absorbed using a cost input allocation base. New contracts are the contracts subject to CAS 410 requirements.
  - G&A for old contracts is absorbed using the pre-CAS cost of sales allocation base. Old contracts are those not subject to CAS 410 requirements.

- If the contractor established an inventory suspense account under Appendix A of CAS 410 and the account is $5 million or more, the following limitations apply to progress payments:
  - Do not include G&A in progress payments until the value of work in process inventories under new contracts exceeds that under the old.
  - The amount of G&A eligible for progress payments under the contract shall be the contractor's pro rata share of G&A calculated in compliance with CAS 410.
  - Calculate the G&A dollars allocable to the CAS-covered contract using the rate calculated in compliance with CAS 410.
  - Reduce the G&A dollars allocated based on the percentage of G&A costs still allocated using the cost of sales allocation base. For example, $119,000 in G&A expense would be included in progress payments under a CAS-covered contract using the CAS-compliant rate. However, 40 percent of all G&A dollars are still being allocated to other contracts using the pre-CAS rate, so the progress-payment amount must be reduced by 40 percent. The amount allocated to the contract must be reduced by $47,600 ($119,000 x .40).
  - Coordinate your analysis with the cognizant Government auditor to assure proper progress payment calculation.

Liquidation Rate Adjustment for G&A Expense Limitation (FAR 32.503-8 and FAR Appendix A, 9904.410).

Calculate the percentage of contract price that cannot be included as progress payments under the CAS-compliant contract. Divide the dollars that cannot be allowed as progress payments under the CAS-compliant contract by the contract price. For example, if the contract price for the above example is $1,100,000 the percentage would be 4.33 percent ($47,600/$1,100,000).

- Calculate the adjustment in the liquidation rate that would permit the contractor to recover the G&A expense dollars not included in progress payments. For example, if the ordinary liquidation rate is 80 percent, the reduction for unbilled G&A would be 3.46 percent (4.33 x 80.00 percent).

- To calculate the adjusted liquidation rate, subtract the effect of the reduction from the ordinary rate. In the example above, the revised rate would be 76.54 percent (80.00 percent - 3.46 percent).

- Coordinate your analysis with the cognizant Government auditor to assure proper calculation of the revised liquidation rate.
• Situations to Consider the Alternate Method of Liquidation (FAR 32.503-9(a)). Use the ordinary method throughout the contract, unless the contracting officer adjusts the liquidation method. The alternate method permits the contractor to retain the earned profit element of the contract prices for completed items in the liquidation process.

• The contracting officer MAY reduce the liquidation rate (increasing contractor working capital) if ALL of the following requirements are met:

1. The contractor requests a reduction in rate.
2. The liquidation rate has not been reduced in the preceding 12 months.
3. The contract delivery schedule extends at least 18 months from the contract award date.
4. Actual cost data are available:
   - For products delivered, or
   - If no products have been delivered, for a performance period of at least 12 months
5. The reduced liquidation rate would result in the Government recouping under each invoice the full extent of the progress payments applicable to the costs allocable to that invoice.
6. The contractor would not be paid for more than the costs of items delivered and accepted (less allocable progress payments) and the earned profit on those items.
7. The unliquidated progress payments would not exceed the limit prescribed in Paragraph (a)(5) of the Progress Payments clause.
8. The parties agree on an appropriate rate.
9. The contractor agrees to certify annually, or more often if requested, that the alternate rate continues to meet the three liquidation requirements in 5, 6, and 7 above. The certificate must be accompanied by adequate supporting information.
   - The contracting officer MUST adjust the liquidation rate in the following situations:
     1. Increase the rate for both previous and subsequent transactions, if the contractor experiences a lower profit rate than the rate anticipated at the time the liquidation rate was associated with contract items already delivered, as well as subsequent progress payments.
     2. Increase or decrease the rate in keeping with the successive changes to the contract price or target profit when:
        - The target profit rate is changed under a fixed-price incentive contract with successive targets, or
        - A redetermined price involves a change in the profit element under a contract with prospective price redetermination at stated intervals.

Minimum Alternate Liquidation Rate (FAR 32.503-10 and FAR Appendix A 9904.410). The minimum liquidation rate is the amount of expected progress payments divided by the contract price. Written as an equation, the relationship would be:

\[
\text{Minimum Liquidation Rate} = \frac{\text{Total Estimated Cost} \times \text{Progress Payment Rate}}{\text{Estimated Contract Price}}
\]

Where:
Total Estimated Cost = Total estimated cost for the contract.
• When appropriate, adjust:
   - As described above to exclude G&A that cannot be included in progress payments when the contractor is involved with the implementation of CAS 410.
   - To include the estimated value of any work authorized but not yet priced. However, the adjusted cost must not exceed the price of all authorized work or the funds or the funds obligated for the contract.

Estimated Contract Price = The price of an FFP contract or the estimated price for other fixed-price contracts.
• When appropriate, adjust to include the estimated price of any work authorized but not yet priced and any projected economic adjustments. However the cost must not exceed the Government estimate of the price of all authorized work or the funds obligated for the contract.
For example: If the progress payment rate is 80 percent, the total estimated cost eligible for progress payments is $10 million, and the estimated contract price is $11 million, the rate would be calculated as follows:

\[
\text{Minimum Liquidation Rate} = \frac{10,000,000 \times 80\%}{11,000,000} = 72.8\%
\]

(Always round up to the next highest tenth of a percent. Rounding down would produce a rate below the minimum rate calculated.)

Assuming that you adopted the alternate liquidation rate calculated above in the thirteenth month of contract performance and contract costs and deliveries are the same as in the ordinary method calculations above, the payment pattern would be revised as shown in the table below. Note that the alternate liquidation rate substantially increases the total amount paid to the contractor prior to final delivery.

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<th>Monthly Progress Payments</th>
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* Remaining unliquidated progress payments.

Contract Modification ([FAR 32.503-9(c)](https://www.federalregister.gov/documents/2023/02/01/2023-02306/contract-modification)). Whenever the liquidation rate is changed, the contracting officer must issue a contract modification changing the liquidation rate in the Progress Payments clause. Adequate consideration for these modifications is included in the initial contract. The parties must promptly make the payment or liquidation required by the change.

### 9.7 Applying Financial Indicators To Subordination Agreement Need Decisions

Subordination Agreement. A subordination agreement is an agreement whereby a contractor's creditor subordinates its security interest in contractor-held property to the security interest held by the Government. In other words, the creditor agrees to relinquish its claim to any property properly claimed by the Government under the agreement.

For example: A creditor has a lien on a contractor's inventory. Before approving progress payments for material acquisition, the contracting officer insists on assurances that the creditor will not claim the material as part of the contractor's inventory subject to the lien. The contractor obtains a formal written agreement from the creditor, whereby the creditor agrees to subordinate its claim to the inventory.

Possible Situations for Agreement ([FAR 32.304-6(e)](https://www.federalregister.gov/documents/2023/02/01/2023-02306/contract-modification), [FAR 32.409-3(d)(3)](https://www.federalregister.gov/documents/2023/02/01/2023-02306/contract-modification), and [FAR 32.501-5(b)](https://www.federalregister.gov/documents/2023/02/01/2023-02306/contract-modification)). Consider requiring the contractor to provide appropriate subordination agreement(s) when necessary to protect the Government's rights when the Government:

- Guarantees a contractor loan from a private financial institution;
- Makes agency-approved advance payments; or
- Makes progress payments based on costs.

Points to Consider in Agreement Decision. Determine the need for a subordination agreement after consultation with your organization’s legal counsel. As you make your determination, consider:

- Other available financial guarantees;
- The contractor’s present financial position and projections for the future;
• The type of contract and the nature of the work being done under the contract;
• The contractor's production capabilities and projections for contract completion of the contract in the required time and in accordance with contract requirements; and
• The adequacy of the contractor's accounting system (e.g., its ability to segregate Government inventory from the general inventory).

Agreement Timing. Obtain the subordination agreement as soon as you identify the need for the agreement. Do not delay until the contractor's financial problems imperil contract performance. It is more difficult to protect the Government's interest when the contractor is already in financial difficulty.

Obtaining a Subordination Agreement. Do not attempt to obtain a subordination agreement directly from the contractor's creditor. Require the contractor to obtain the agreement.

Remember that the Government contract is with the contractor, not the creditor.

• If you believe that the creditor might be unnecessarily alarmed by a Government request for subordination, consider meeting with both the creditor and the contractor to clarify the situation.
• If the creditor refuses to execute an agreement, that may indicate that the contractor has serious financial problems. Inquire into the reasons surrounding the creditor's refusal, to determine if the contractor's financial position warrants more drastic action (e.g., a finding of nonresponsibility for a proposed contractor or the suspension of progress payments for an existing contractor).

Security in Support of a Subordination Agreement (FAR 52.232-23). Normally, a creditor will require some form of security before agreeing to the subordination agreement. Assure that any security offered by the contractor complies with the terms of the contract. For example: One common form of security is an assignment of claims. Under an assignment of claims, the contractor transfers to a bank, trust company, or other financing institution, its right to payment for contract performance. However, the Assignment of Claims clause establishes restrictions for contractor assignment of claims.

Subordination Agreement Format. The FAR does not prescribe a format for a subordination agreement. The example on the next page is the body of an agreement format developed by the Defense Contract Management Agency for corporate creditors and property associated with progress payments.

• Consult with your legal counsel to assure that any format you use meets the needs of your particular contracting situation.
• Assure that the person signing the agreement has the authority to bind the creditor to such an agreement.

SUBORDINATION AGREEMENT

___________, a corporation of __________, hereinafter called the Debtor, has entered into Contract Numbers _________ with the United States of America, hereinafter called the Government, for the furnishing of defense supplies and expects to enter into future contracts with the Government for the furnishing of defense supplies. Said contracts include the Progress Payments clause. Pursuant thereto, the Debtor has requested the Government to provide progress payments, which request the Government is willing to grant in accordance with the terms of said clause and upon condition that ________, hereinafter referred to as the Creditor, agrees to subordinate to the rights of the Government under or arising out of said contracts and future contracts, any and all present and future recorded or perfectible liens under the Uniform Commercial Code or other liens or interest of the Creditor with respect to any parts, material, inventory or work in process, and other property to which the Government has title pursuant to paragraph (d) of said Progress Payments clause. In consideration of the making of progress payments to the Debtor by the Government, the undersigns agrees as follows: Any and all present and future recorded or perfectible liens under the Uniform Commercial Code or other liens or interest of the undersigned Creditor with respect to any of the parts, material, inventory or work in process, and other property to which the Government has title pursuant to paragraph (d) of said Progress Payments clause, are fully subordinated to the rights and interests of the
Government under or arising out of the aforementioned contracts and future contracts.
If any person, firm, corporation or entity other than the Debtor becomes obligated to perform said contracts or any part thereof, whether by operation of law or otherwise, any and all present and future rights of the Creditor shall remain fully subordinated to the rights of the Government.
The Subordination Agreement shall not be affected by any action extending the time of performance of said contracts or by making of any amendment or modification authorized by the terms of said contracts.
The Creditor hereby certifies that it has not given or executed any prior Subordination Agreement with respect to its claims against the Debtor except as follows: _________________________________________.
The Creditor hereby agrees to direct the Debtor (a) to mark its records in accordance with this Subordination Agreement and (b) to confirm receipt of notice by signing in the place indicated below.
This Agreement shall inure to the benefit of and may be enforced by the United States.

Volume 5 – Negotiation Techniques
1.0 Chapter Introduction
1.1 Describing Negotiations
Negotiation Is Part of Life. Negotiation is a part of normal everyday life. In fact, experts on the subject have said that life, itself, is just one continuous negotiation.
Still, many people feel that they are not experienced contract negotiators. Perhaps they do not realize that there are many types of contracts. Not all are complex written agreements. Most contracts are oral agreements which may or may not involve the exchange of monetary consideration. Without realizing it, you have probably been involved in a variety of contract negotiations every day of your life. In fact, we constantly bargain with other people to fulfill both our monetary and non-monetary needs.
- At work, you are probably involved in continuing negotiations with your superiors, subordinates, and coworkers concerning a variety of personal and professional issues. They may be as minor as deciding who will make the next pot of coffee or as major as the rating on your annual performance evaluation.
- At home, you are probably involved in continuing negotiations with your family over a wide variety of issues. They may be as minor as the time for dinner or as major as where you will live. A child crying for a favorite toy can be a formidable negotiator.
- You have likely been involved in numerous negotiations that will have a long-term affect on the course of your life, including:
  - The terms of your current employment;
  - An automobile purchase contract or lease agreement; or
  - Your home mortgage or apartment rental agreement.
In fact, you must negotiate for most things you want in life. You can only avoid negotiation if you have no desire for anything held or controlled by someone else. Regardless of your profession, skill as a negotiator is essential to your success. In Government contracting, the skill is particularly important because your daily work requires you to obtain supplies and services from responsible sources at fair and reasonable prices.
Description of Negotiation. Negotiation is a process of communication by which two parties, each with its own viewpoint and objectives, attempt to reach a mutually satisfactory result on a matter of common concern.
In negotiation, a mutually satisfactory result is vital, because even though the parties may have opposing interests they also are dependent on each other. Labor and management, for example, need each other
to produce products efficiently and effectively. Likewise, buyers and sellers need each other to transact business. Both sides must be willing to live with the result. Negotiation is not one party dictating or imposing terms on another. When that happens, the outcome will rarely produce mutual satisfaction. The result can only be mutually satisfactory if both differences and common interests are considered.

To obtain agreement, you must generally sacrifice or yield something in order to get something in return. In other words, you must give to get. But as long as the anticipated benefit is greater than your sacrifice, a negotiated agreement is beneficial. The limit on yielding is reached when one party believes that concessions would be more costly than the benefits of agreement.

While negotiation is often a process of mutual sacrifice, it should also be a process of finding ways whereby both parties will have their interests optimized under the circumstances. Negotiations should not just be aimed at how to split the pie. Instead they should be aimed at finding optimal solutions -- ways to make the pie larger for all concerned. For example, both parties benefit when negotiators find that a change in buyer requirements will enable the seller to deliver a higher-quality standard product instead of a specially built product. The seller realizes lower risks or perhaps more profit from the sale of a standard product. The buyer pays a lower price for a product that meets the buyer's real needs.

**Negotiated Contracts vs. Sealed Bidding (FAR 14.101(d), FAR 15.000, and FAR 52.215-1).** The Federal Acquisition Regulation (FAR) states that any contract awarded using other than sealed bidding procedures is considered a negotiated contract.

- Procedures for contracting by sealed bidding require the Government to evaluate bids without discussions and award to the responsible bidder whose bid, conforming to the invitation for bids, will be most advantageous to the Government considering only price and price related factors. Negotiations are not permitted prior to contract award.

- Procedures for contracting by negotiation permit negotiations prior to contract award. However, a solicitation under procedures for contracting by negotiation may or may not actually require negotiations. For example, the Instructions to Offerors -- Competitive Acquisition:
  - Standard provision states that the "Government intends to evaluate proposals and award without discussions." When that provision is used, actual negotiations are not permitted unless the contracting officer determines in writing that they are necessary.
  - Alternate I, states that the "Government intends to evaluate proposals and award a contract after conducting discussions with offerors whose proposals have been determined to be within the competitive range." Here negotiations are required with any offeror(s) in the competitive range.

**In Government contracting:** (FAR 15.306(d)). Negotiations are exchanges, in either a competitive or sole source environment, between the Government and offerors, that are undertaken with the intent of allowing the offeror to revise its proposal. These negotiations may include bargaining. Bargaining includes persuasion, alteration of assumptions and positions, give-and-take, and may apply to price, schedule, technical requirements, type of contract, or other terms of a proposed contract. When negotiations are conducted in a competitive acquisition, they take place after establishment of the competitive range and are called discussions.

The key word in this definition is "bargaining." The Government anticipates that bargaining will occur in competitive as well as noncompetitive negotiations.

**Satisfactory Negotiation Results (FAR 15.101, FAR 15.402(a), FAR 43.103(a), and FAR 49.201(a)).** What is a satisfactory result in a Government contract negotiation? That depends on whether the negotiation is competitive or noncompetitive and when it takes place in the contracting process.

- Competitive discussions may take place either before contract award or before award of a task/delivery order under an indefinite-delivery indefinite-quantity contract. The discussions with each offeror in the competitive range should be directed to facilitating preparation of a final proposal revision that will provide the best value for the Government, given the award criteria, the offeror's proposal, and existing constraints within the offeror's organization. Then the Government can evaluate the available proposals to determine which proposal offers the overall best value.

- Noncompetitive negotiations can take place either before or after award. In noncompetitive negotiations for:
Award of a new contract or a task/delivery order under an existing indefinite-delivery indefinite-quantity contract, the satisfactory result is a contract or order that provides for the purchase of the required supplies or services from a responsible source at a fair and reasonable price.

A bilateral contract modification, the satisfactory result is a contract modification that reflects the agreement of the parties about any modification of contract terms, including any necessary equitable adjustment related to the modification.

A fixed-price termination for convenience settlement, the satisfactory result is a settlement that fairly compensates the contractor for the work done and the preparations made for the terminated portions of the contract, including a reasonable allowance for profit.

The Other Party in Government Contract Negotiation. In preaward Government contract negotiations, a potential recipient of the Government contract is normally referred to as an “offeror.” In post-award situations, the contractor may still be considered an offeror, because the negotiation centers on the offer submitted by the contractor. However, most contracting professionals use the term contractor after contract award. It would be particularly confusing to refer to a firm submitting a contract termination proposal as an offeror.

To avoid confusion, this text will consistently use the term “contractor” in referring to the non-Government party in a Government contract negotiation.

Negotiation Success. A successful negotiation is a product of many factors. Factors that contribute to success in any negotiation always include:

- The specific circumstances surrounding each negotiation. This may be viewed as the bargaining leverage available to each party involved. For example, the circumstances often favor the contractor when the Government is bargaining for a high-demand product in short supply. Similarly, the circumstances will generally favor the Government when several firms are vying to provide a product only demanded by the Government.

- The skill of the negotiators. Highly skilled negotiators will have a greater probability of negotiation success than negotiators who do not have the requisite skills. Good negotiators can often obtain favorable deals under adverse circumstances. Conversely, negotiators with poor bargaining skills sometimes fail to obtain satisfactory agreements even when the circumstances favor their bargaining position.

- The motivation and fairness of each party. The greater the motivation and fairness on each party, the more likely it is that the negotiations will end with a satisfactory agreement.
  - Successful outcomes are more likely when one or both parties are willing to make fair concessions.
  - The likelihood of successful negotiation decreases when either party is poorly motivated or unfair. Achieving negotiation success becomes particularly difficult when one party is unwilling to compromise or show any flexibility.

Negotiator Abilities. The best negotiators exhibit the ability to:

- Plan carefully. Planning begins with requirement development and continues through negotiation. It includes market research, solicitation preparation, and proposal evaluation. You must know the product, the rules of negotiation, and your alternatives.

- Gain management support. Management support is vital to your success as a negotiator. If contractor personnel know that management does not support your objectives, the contractor’s negotiators may simply tolerate you until they can escalate the negotiation to management.

- Effectively apply bargaining techniques. Good negotiators are capable of employing bargaining techniques which facilitate negotiation success.

- Communicate effectively. Good negotiators:
  - Sell others on their bargaining position by speaking in an articulate, confident, and
businesslike manner.

- Disagree with others in a cordial and non-argumentative manner.
- Listen effectively. Many otherwise good negotiators begin to concentrate on their answer almost as soon as the other party begins speaking. As a result, they miss the true meaning of the communication.

**Tolerate conflict while searching for agreement.** Most contract negotiations involve some conflict. After all, no two people on earth agree on everything all the time. Negotiators who:

- Can agree to disagree in a polite and respectful manner will be able to search for ways to achieve a mutually satisfactory outcome.
- Will give anything to avoid conflict are often not able to secure satisfactory results for their side.
- Who display a tendency for arguing will increase the conflict and make a satisfactory outcome all the more difficult to attain.

**Project honesty.** Good negotiators are honest and they make others believe that they are honest. Securing trust is vital to securing a mutually satisfactory outcome. Concessions are difficult to obtain when others do not trust you.

**Foster team cooperation.** All members of the negotiation team may not agree on every issue. Disagreements must be resolved in a manner that fosters team cooperation and the appearance of team unity during contract negotiations.

**Apply good business judgment.** Good negotiators are able to evaluate every change in a negotiating position based on its overall effect on attaining a mutually satisfactory result.

### 1.2 Recognizing Possible Negotiation Outcomes And Styles

**Negotiation Outcomes.** In general, there are three possible outcomes to every negotiation. These outcomes are known as “win/win,” “win/lose,” and “lose/lose.” Any negotiation can conceivably result in any of these outcomes, but different negotiation styles can make one or the another more likely.

**Win/Win Outcomes (FAR 15.101, FAR 15.402(a), FAR 43.103(a), and FAR 49.201(a)).** A win/win outcome (also known as a both-win outcome) occurs when both sides achieve long-term satisfaction with negotiation results. Negotiations emphasize developing a mutually beneficial agreement. For example, awarding a contract at a fair and reasonable price is in the best interest of both the contractor and the Government.

Commercial businesses are emphasizing win/win negotiations because of the increasing importance of long-term business relationships. Each side has a vested interest in mutual long-term satisfaction. Any short-term advantage achieved by wringing out every last concession is usually not as important a long-lasting business relationship.

There are several important reasons why Government negotiators should also strive for win/win outcomes.

- FAR guidelines emphasize a mutually satisfactory result by using negotiation guidelines such as best value, fair and reasonable price, equitable adjustment, and fair compensation for work performed. These guidelines emphasize that the Government should not win at the expense (or loss) of the contractor.
- The Government has a vested interest in the long-term contractor success and survival.
  - Well-stocked good-quality suppliers providing goods and services at reasonable prices are essential to Government operations.
  - Contractor success enhances competition by encouraging more firms to do business with the Government, and increased competition reduces contract prices and improves quality.
- Win/win negotiators often achieve better outcomes. A negotiator is less likely to be giving and trusting when the other negotiator displays selfishness and mistrust. The genuine concern
demonstrated by win/win negotiators is frequently reciprocated by the other party.

- Win/win negotiations are typically much less confrontational and tend to foster better long-term relationships.
- Win/win negotiations are characterized by much higher levels of trust and cooperation which facilitate the negotiation process.

**Win/Lose Outcomes.** When a negotiation results in a win/lose outcome, one side is perceived as having done significantly better at the expense of the other. This type of negotiation tends to be highly competitive, with a large degree of mistrust on both sides.

In commercial business, win/lose outcomes often occur when the negotiators do not anticipate additional business beyond the initial transaction. There is no motivation to ensure long-term satisfaction for the other side. Examples of win/lose outcomes abound in everyday life, such as private home and auto sales where the negotiators generally do not anticipate additional negotiations with the other party.

- Both sides often feel that they are the losers in a win/lose negotiation because of the competitiveness and mistrust that characterized the negotiation.
- The losing side might feel good at the conclusion of the win/lose negotiation because of their immediate perception that they obtained the best deal possible under the circumstances.
- In the long run, the losing party often regrets the agreement after discovering that the deal was not a good one after all.
- The losing party becomes even more mistrustful of the other party and reluctant to continue any sort of business relationship.

In a monopsony situation, where the Government is the only buyer, the Government could achieve many short-term wins to the detriment of contractors by dictating contract terms. But win/lose outcomes may have the following negative long-term consequences:

- Suppliers on the losing end of win/lose negotiations may be forced out of business.
- High-quality suppliers may no longer be willing to do business with the Government.
- Contracts with the remaining suppliers may have a greater risk of poor-quality or overpriced deliverables.

**Lose/Lose Outcomes.** When there is a deadlock, the negotiating outcome is known as a lose/lose outcome. A deadlock occurs when final agreement cannot be obtained. Since both parties had a stake in a successful outcome of the negotiation (or they would not have been negotiating in the first place), both sides lose when negotiations stalemate and deadlock occurs.

The contractor side may lose more than just the profit projected for the lost Government contract.

- Any contribution income (i.e., the difference between revenue and variable cost) that could have been used to help absorb contractor fixed costs may be lost. As a result, all fixed costs must be absorbed by the other business of the firm. The resulting cost increases for those items may reduce company profits and may even contribute to overall company losses.
- The direct labor associated with the proposed contract may no longer be needed by the contractor. As a result, the contractor may be forced to lay off employees. A lay-off may affect labor management relations. It may also increase direct labor costs for other contracts, because lay-offs typically affect lower-paid employees first.

When a deadlock occurs, the Government side also suffers a considerable loss because the desired supply or service often cannot be procured in a timely manner. This is particularly true when the Government is negotiating with a single firm under an exception to full and open competition. When deadlock occurs with a sole source contractor, the unique product or service cannot be obtained. **FAR 15.405(d).** Sometimes, avoiding a deadlock is very difficult when the other party is unfair or uncompromising. The Government must decide on the better alternative: deadlocking or being on the losing end of a win/lose outcome. Considerable effort should be made to avoid a deadlock because the Government side will suffer a loss whenever one occurs.

If the contractor insists on an unreasonable price or demands an unreasonable profit/fee, take all
authorized actions to resolve the deadlock. Determine the feasibility of developing an alternative source. Consider other available alternatives (e.g., delaying the contract, revising requirements, or Government performance). If the contracting officer cannot resolve the deadlock, the contract action must be referred to higher-level management. Management involvement assures a unified Government approach to resolving or accepting the deadlock.

Win/Win Negotiation Style. The win/win negotiation style is to negotiate based on the merits of the situation to obtain a satisfactory result. Generally, you will find that win/win negotiators:

- **Attack the problem not each other.** The differences between the two sides are a mutual problem. In a win/win negotiation, discussions center on identifying and resolving these differences, not attacking the messenger. Negative personal comments can add nothing to attaining a mutually satisfactory result. Ideally, negotiators should think of themselves as working side-by-side to resolve differences in a cordial and businesslike manner.

- **Focus on long-term satisfaction and common interests.** Many negotiators become so involved with their objectives in a particular negotiation that they lose sight of the bottom line -- long-term satisfaction. Winning a particular point in a negotiation may mean losing a chance to achieve a mutually satisfactory result.

- **Consider available alternatives.** Your solution may not be the only right solution to a particular point in the negotiation. The same may be true of the contractor's position. Attempt to identify other solutions for consideration. The final solution may not be any better than the original solution offered by one side or the other. However, it is perceived as better, because it was reached through mutual cooperation.

- **Base results on objective standards whenever possible.** Negotiators are more likely to be satisfied with a particular result, when it is based on an objective standard. Do not refuse to compromise simply because "that's the auditor's recommendation." What was the standard used by the auditor in developing that recommendation? There may be many standards to consider including:
  - Historical experience;
  - Industry practice; or
  - Projections developed using quantitative analysis.

- **Focus on positive tactics to resolve differences.** Do not rely on deceptive behavior or bargaining ploys. Tricking another negotiator may win an apparently favorable result, but the results during contract performance or in the next negotiation may be devastating.

- **Emphasize the importance of a win/win result.** Remain positive during and after the negotiation. Never gloat about winning the negotiation, even as a joke.
  - The perception of the result by each side determines whether an outcome is win/win or win/lose. In other words, the same contractual result could be viewed as being either win/win or win/lose depending on the eyes of the beholder. For example, a $700,000 contract price could be considered a win/win or win/lose outcome depending on how the contractor views that price.
  - The negotiator's behavior during and after negotiation is often the primary influence on the other side's perception.
  - Regardless of the negotiation result, the contractor is more likely to perceive a win/win outcome when the Government negotiator exhibits win/win behavior.
  - The contractor is more likely to perceive a win/lose result when the Government side appears to have a win/lose attitude.
  - You should exhibit a win/win attitude before, during, and after negotiation.

Win/Lose Negotiation Style. The win/lose negotiation style is to negotiate based on power and using that power to force one negotiator's will on the other. That power could be real or only perceived by the other
negotiator. Generally, win/lose negotiators tend to:

- **Use deceptive negotiation tactics to increase or emphasize their relative power in the negotiation.** These deceptive tactics may work, but once identified by another negotiator, their use can actually jeopardize the possibility of a mutually satisfactory result. Several of the more commonly used tactics will be described later in this text.

- **Focus on negotiating positions rather than long-term satisfaction.** Focusing on the legitimacy of a single position (rather than the reasons for differences between positions) emphasizes disagreement rather than agreement.

- **Be argumentative.** Focusing on positions leads to arguments over whose position is better, instead of how to reach agreement.

- **Show reluctance to make any meaningful concessions.** Focusing on positions also makes them unwilling to make meaningful concessions. Any concession might lead to questions about the legitimacy of their position. Such questions may weaken their actual or perceived power in the negotiation.

- **Be highly competitive and mistrustful of other negotiators.** They do not share information unless it is absolutely necessary. Alternatively, they may try to hide relevant information by overloading the other negotiator with irrelevant information.

**Spectrum of Negotiation Styles.** Negotiation styles are rarely pure win/win or win/lose. Instead, they cover a wide spectrum between the two extremes. You should strive for a pure win/win style, but many negotiators exhibit a combination of win/win and win/lose traits during the course of a negotiation. For example, mildly deceptive behavior is sometimes exhibited by even the best win/win style, but many negotiators exhibit a combination of win/win and win/lose traits during the course of a negotiation. The use of some win/lose traits may even be justified, particularly when dealing with a win/lose negotiator. Similarly, win/lose negotiators often exhibit some win/win traits even though this behavior may only be intermittent or a ploy to deceive the other negotiator.

The figure below depicts the range of negotiation styles with win/win and win/lose at opposite ends of the range. While the spectrum of styles ranges from 100 percent win/win to 100 percent win/lose, the overwhelming majority of negotiators have a style that falls somewhere between the two extremes.

<table>
<thead>
<tr>
<th>Win/Win</th>
<th>Win/Lose</th>
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</thead>
<tbody>
<tr>
<td>100%</td>
<td>0%</td>
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<tr>
<td>90%</td>
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<tr>
<td>10%</td>
<td>100%</td>
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</tbody>
</table>

No negotiation style or combination of styles assures a win/win outcome. In fact, following a particular style does not even guarantee that others will perceive that you are following that style. Behavior that is 60 percent win/win and 40 percent win/lose may be perceived as win/lose by the contractor and may even result in deadlock. Likewise, there is always a possibility that a negotiating style that is 30 percent win/win and 70 percent win/lose may be perceived as win/lose by the contractor. While the proportion of win/win behavior needed to produce a win/win outcome varies by negotiation and is never certain, the probability of a win/win outcome typically increases in proportion to the win/win behavior exhibited by the negotiators. Conversely, the probability of either a win/lose or lose/lose outcome increases in proportion to the win/lose behavior exhibited by the negotiators.

**Negotiation Style Comparison.** The following table compares win/win and win/lose negotiation styles:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Win/Win Style</th>
<th>Win/Lose Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiation Goal</td>
<td>Obtain a result that is satisfactory to both sides, including a fair and reasonable price.</td>
<td>Obtain the best possible deal for your side regardless of consequences to the other side.</td>
</tr>
<tr>
<td>Focus</td>
<td>Solve mutual</td>
<td>Defeat the other party.</td>
</tr>
<tr>
<td>Environment</td>
<td>Cooperation and trust</td>
<td>Mistrust and gamesmanship</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Negotiation Characteristics</td>
<td>• Negotiators attack the problem not each other</td>
<td>• Tactics designed to increase or emphasize relative power.</td>
</tr>
<tr>
<td></td>
<td>• Focus on long-term satisfaction</td>
<td>• Focus on negotiating positions rather than long-term satisfaction.</td>
</tr>
<tr>
<td></td>
<td>• Available alternatives considered</td>
<td>• Argumentative</td>
</tr>
<tr>
<td></td>
<td>• Results based on objective standards</td>
<td>• Reluctance to make any meaningful concessions</td>
</tr>
<tr>
<td></td>
<td>• Focus on positive tactics to resolve differences</td>
<td>• Highly competitive</td>
</tr>
<tr>
<td></td>
<td>• Emphasis on a win/win result.</td>
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</tbody>
</table>

1.3 Describing Attitudes That Lead To Successful Negotiations

**Overriding Negotiation Themes.** Government negotiators should always keep in mind the following basic attitudes when negotiating Government contracts:

- Think win/win;
- Sell your position;
- Win results not arguments;
- Everything is negotiable; and
- Make it happen.

**Think Win/Win.** A win/win outcome is the paramount objective in a Government contract negotiation. Consequently, you should consciously display a win/win attitude and negotiating style throughout the negotiation process. Use win/win negotiation tactics and avoid tactics that might lead the contractor to perceive that you are using a win/lose style.

**Sell Your Position.** During negotiations, you are acting as an agent of the Government trying to sell your positions to the contractor’s team. Accordingly, you should strive to be persuasive while being respectful and polite. In negotiations as in other forms of sales, it is easier to sell a product when the prospective customer likes and respects you.

**Win Results Not Arguments.** Trying to win the argument is too often a sign of a win/lose negotiation. When argumentative behavior characterizes negotiations, one or both sides are likely to perceive a win/lose outcome even when the final outcome could otherwise appear balanced and fair. Remember that persuasion is not only a matter of logic and content, but also significantly depends on the manner of presentation.

**Everything Is Negotiable.** No negotiation position is sacred and off limits if it prevents the more important goal of a mutually satisfactory outcome. Consequently, you must always be prepared and willing to negotiate all issues.
Make It Happen. To achieve long-term satisfaction, you may need to display creativity, initiative, and even courage. Your goal is a mutually satisfactory outcome. Find a way to make it happen.

- 2.0 - Chapter Introduction
- 2.1 - Reviewing The Purchase Request And Related Market Research
- 2.2 - Considering Contract Pricing In Your Market Research
- 2.3 - Using Market Research To Estimate Probable Price
- 2.4 - Using Market Research To Estimate Probable Price
- 2.5 - Using Market Research To Estimate Probable Price


2.0 Chapter Introduction

Procedural Steps. The following flow chart outlines the steps of fact-finding:
2.1 Identifying Contractor Information Needed For Proposal Analysis

Exchanges (FAR 15.306). "Exchange" is a general term used to describe any dialogue between the Government and the contractor after receipt of the proposal(s), including contract negotiations. However, the material in this chapter is limited to exchanges prior to contract negotiation.

The objective of prenegotiation exchanges is to identify and obtain available contractor information needed to complete proposal analysis. In addition, most types of prenegotiation exchanges provide the contractor with an opportunity to seek clarification of the Government's stated contract requirements.

In competitive negotiations, there may be several different types of exchanges, each with its own unique rules:

- Clarifications with the intent to award without discussions;
- Communications with contractors before establishment of the competitive range; and
- Exchanges after establishment of the competitive range but before negotiations.
In noncompetitive negotiations, exchanges after receipt of proposals and prior to negotiations are normally referred to as fact-finding.

**Information Already Available.** Before conducting an exchange with the contractor, you should already have:

- The solicitation, unilateral contract modification, or any other document that prompted the contractor’s proposal;
- The proposal and all information submitted by the contractor to support the proposal;
- Information from your market research concerning the product, the market, cost or price trends, and any relevant acquisition history;
- Any relevant field pricing or audit analyses;
- In-house technical analyses; and
- Your initial price analysis and, where appropriate, cost analysis.

**Clarifications (FAR 15.306(a), FAR 52.212-1(g), and FAR 52.215-1(f)(4))** (WECO Cleaning Spec., CGEN B-279305, June 3, 1998).

Clarifications are limited exchanges, between the Government and contractors, that may occur when the Government contemplates a competitive contract award without discussions. Remember that award may only be made without discussions when the solicitation states that the Government intends to evaluate proposals and make award without discussions. For example, both the standard FAR Instructions to Offerors -- Competitive Acquisition and Instructions to Offerors -- Commercial Items provisions advise prospective offerors that award will be made without discussions. When you contemplate making a competitive contract award without conducting discussions, you may give one or more contractors the opportunity to clarify certain aspects of proposals that may have an effect on the award decision. For example, a request for clarification might give the contractor an opportunity to:

- Clarify the relevance of a contractor’s past performance information;
- Respond to adverse past performance information if the contractor has not previously had an opportunity to respond; or
- Resolve minor or clerical errors, such as:
  - Obvious misplacement of a decimal point in the proposed price;
  - Obviously incorrect prompt payment discount;
  - Obvious reversal of price f.o.b. destination and f.o.b. origin; or
  - Obvious error in designation of the product unit.
- Resolve issues of contractor responsibility or the acceptability of the proposal as submitted.

The key word is limited. The purpose of a clarification is to permit a contractor an opportunity to clarify key points about the proposal as originally submitted. You must not give the contractor an opportunity to revise its proposal.

**Communications (FAR 15.306(b)).** When negotiations are anticipated, the contracting officer must first establish the competitive range. Communications are exchanges, between the Government and contractors, after receipt of proposals, leading to establishment of the competitive range. Communications are only authorized when the contractor is not clearly in or clearly out of the competitive range. Specifically, communications:

- Must be held with contractors whose past performance information is the determining factor preventing them from being placed within the competitive range. Such communications must address adverse past performance information to which the contractor has not had a prior opportunity to respond.
- May be held with other contractors whose exclusion from, or inclusion in, the competitive range is uncertain. They may be used to:
- Enhance Government understanding of the proposal;
- Allow reasonable interpretation of the proposal; or
- Facilitate the Government's evaluation process.

- Must not be held with any contractor not in one of the situations described above.

The purpose of communications is to address issues that must be explored to determine whether a proposal should be placed in the competitive range.

- Communications must address any adverse past performance information to which the contractor has not previously had an opportunity to comment.

- Communications may address:
  - Ambiguities in the proposal or other concerns (e.g., perceived deficiencies, weaknesses, errors, omissions, or mistakes); and
  - Information relating to relevant past performance.

- Communications must not permit the contractor to:
  - Cure proposal deficiencies or material omissions;
  - Materially alter the technical or cost elements of the proposal; and/or
  - Otherwise revise the proposal.

**Exchanges After Establishment of the Competitive Range But Before Negotiations.** Exchanges after establishment of the competitive range but before negotiations should normally not be necessary. Proposals included in the competitive range should be adequate for negotiation. However, there may be situations when you need additional information to prepare reasonable negotiation objectives. The purpose of such exchanges is to obtain additional information for proposal analysis and to eliminate misunderstandings or erroneous assumptions that could impede objective development. You must not give the contractor an opportunity to revise its proposal.

**Fact-Finding (FAR 15.406-1).** In a noncompetitive procurement, fact-finding may be necessary when information available is not adequate for proposal evaluation. It will most often be needed when:

- The proposal submitted by the contractor appears to be incomplete, inconsistent, ambiguous, or otherwise questionable; and
- Information available from market analysis and other sources does not provide enough additional information to complete the analysis.

The purpose of fact-finding is to obtain a clear understanding of all the contractor's proposal, Government requirements, and any alternatives proposed by the contractor. Hence, both you and contractor personnel should view fact-finding as an opportunity to exchange information and eliminate misunderstandings or erroneous assumptions that could impede the upcoming negotiation. Typically, fact-finding centers on:

- Analyzing the actual cost of performing similar tasks. This analysis should address such issues as whether:
  - Cost or pricing data or information other than cost or pricing data are accurate, complete, and current;
  - Historical costs are reasonable; or
  - Historical information was properly considered in estimate development.

- Analyzing the assumptions and judgments related to contract cost or performance, such as:
  - The reasonableness of using initial production lot direct labor hours and improvement curve analysis to estimate follow-on contract labor hours;
  - Projected labor-rate increases; or
  - Anticipated design, production, or delivery schedule problems.
Because the procurement is not competitive, there is a special temptation to negotiate during fact-finding. However, it is especially important for both parties to avoid that temptation. Negotiating during fact-finding causes the Government to lose in two ways:

- The negotiations may inadvertently harm the Government position because the issues are negotiated before analysis is completed.
- Once fact-finding turns into negotiation, it becomes less likely that any remaining fact-finding issues will be clarified.

2.2 Selecting Methods For Conducting An Exchange

Methods for Conducting an Exchange. The following table identifies several methods commonly used to conduct exchanges after receipt of proposals but prior to contract negotiation. The table also identifies when each method is commonly used in procurements with prices exceeding the simplified acquisition threshold.

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<thead>
<tr>
<th>Methods Commonly Used to Conduct Exchanges Prior to Contract Award</th>
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<tbody>
<tr>
<td><strong>Method of Exchange</strong></td>
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<tr>
<td>Telephone</td>
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<tr>
<td>Written</td>
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<td></td>
</tr>
<tr>
<td>Face-to-face -- involving either a single representative from each side or several team members from each side. Teams may include audit and/or technical specialists</td>
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</table>

Telephone Exchanges. Telephone exchanges permit personal and timely communications related to less complex issues. When using telephone exchanges, there are several points that you should consider.

- **Identify all questions to be covered before initiating an exchange.** The telephone is a casual medium of exchange that we use everyday. There is a great temptation to pick up the phone whenever we have a question. Before you do, remember that multiple conversations could
confuse the contractor about the issues involved.

- **Make a checklist of the points you want to cover.** It is easy to get sidetracked during a telephone conversation. The checklist will help keep you on track.

- **Document all information requested or received.** A good record is vital, but a telephone conversation does not normally provide one.
  
  o Generally, a written summary is the most practical approach to documenting a telephone conversation.
  
  o Some contracting officers use audio recordings, but many people resist having a conversation taped. Never tape a conversation unless all parties to the exchange give their permission. Make sure that they give permission and that permission is recorded each time a conversation is taped.

- **Request a written response for complex questions or in situations where the exact wording of the response is important.** For example, the exact wording of any information received from a contractor is particularly important in a competitive situation.

**Written Exchanges.** Written exchanges are particularly useful in competitive situations where it is important to have complete and accurate documentation of the question asked and the exact response. There are several points that you should consider before initiating a written exchange.

- Make sure that your written document asks exactly the question you want answered. The contractor may misinterpret a poorly written question.

- **Make sure that your written exchange meets time constraints.** Traditionally, written exchanges take two weeks or more. With e-mail, fax, and overnight mail, a written exchange can now be almost as fast as a telephone call.

**Face-to-Face Exchanges.** With complex issues, face-to-face exchanges with the contractor are often desirable. Exchanges at the contractor’s place of business may be particularly desirable when issues are complex and the dollar value is large. Quick access to contractor technical information and support can facilitate and expedite the exchange process.

### 2.3 Selecting And Preparing Participants For Face-To-Face Exchanges

**Select Government Team Members.** For smaller less complex contract actions, the contracting officer or contract specialist may be the only Government representative participating in face-to-face exchanges. Normally as the value and complexity of the contract action increase, the size of the Government team will also increase.

Select team members based on their expertise in the areas being considered in the exchange. The table below identifies common roles in face-to-face exchanges and potential team members to fill those roles.

<table>
<thead>
<tr>
<th>Face-To-Face Exchange Team Selection</th>
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<tbody>
<tr>
<td>Team Role</td>
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<tr>
<td>Team leader</td>
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<tr>
<td>Technical analyst</td>
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<td>Position</td>
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<tr>
<td>Inventory manager</td>
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<tr>
<td>Transportation manager</td>
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<tr>
<td>Property manager</td>
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<tr>
<td>Logistics manager</td>
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<td>Pricing analyst</td>
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<tr>
<td>Business terms analyst</td>
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**Team Leader Preparation.** The team leader is responsible for team preparation as well as team leadership during the exchange session. Team preparation includes the following responsibilities:

- **Planning for the exchange session.** Several key points must be considered and many require coordination with team members and the contractor:
  - Location of the exchange session (i.e., Government or contractor facility);
  - Timing of the exchange session;
  - The exchange session agenda;
  - Exchange methodology (e.g., group meeting with the contractor, small team interviews, or individual interviews);
  - Exchange logistics (e.g., team member availability, travel funding when applicable, or meeting room arrangements).

- Assigning roles to team members.
  - Assign analysis responsibilities based on member qualifications.
  - When appropriate, some team members may be assigned specific responsibility for listening to, documenting, and analyzing contractor responses.

- Assuring that team members are generally and individually prepared for the exchange session.

- **Reviewing initial team questions.** This review will assure that the team leader has an opportunity to:
  - Become aware of the projected areas and depth of the exchange.
  - Identify any issues that may cross the boundaries of individual analyses.
  - Identify any inappropriate questions for elimination or rephrasing.

- **Sending initial questions to the contractor.** Sending initial questions to the contractor's designated team leader prior to the exchange session will speed the exchange. Why start the session by asking questions and then waiting an extended period for the contractor's initial response? Sending initial questions before the exchange will permit faster contractor responses and the contractor will also be aware of the areas of greatest Government concern. This awareness will permit better overall contractor preparation for the exchange session.

**General Team Preparation.** All team members must be familiar with the rules for Government-contractor dialog during the exchange session.
• Encourage team members to DO the following:
  o Use questions as a way to begin the exchange.
  o Start with simple questions.
  o Include questions on the rationale for estimated amounts.
  o Break complex issues into simple questions.
  o Continue questioning until each answer is clearly understood.
  o Identify and rank discussion subjects and levels of concern.
  o Be thorough and systematic rather than unstructured.
  o Ask for the person who made the estimate to explain the estimate.
  o Caucus with team members to review answers and, if needed, formulate another round of questions.
  o Assign action items for future exchanges related to unanswered questions.

• Emphasize that team members MUST NOT DO the following:
  o Negotiate contract price or requirements.
  o Make Government technical or pricing recommendations.
  o Answer questions that other team members ask the contractor.
  o Allow the contractor to avoid direct answers.
  o Discuss available funding.

*Technical Analyst Preparation.* Technical analyst preparation includes the following:

• **Analyzing the technical proposal and marking areas of concern.** Government personnel must be able to communicate effectively with contract personnel. By the time that exchanges begin, key contractor personnel will have been working with the proposal for several weeks. Proposal development likely involves systems that have been in place several years. Careful proposal analysis by Government personnel is essential for an effective exchange. Marking the proposal provides a clear reference to guide the exchange.

• **Developing initial questions.** Each Government analyst should develop initial exchange questions during the analysis. Some questions may be answered later in the analysis, but preparing the questions during analysis will eliminate time wasted reconstructing the question at a later time. More importantly, it will assure that a particular concern is not lost in the rush to complete preparations for the exchange. Questions should deal directly with each issue involved in a non-threatening way, such as:
  o How was the estimate developed?
  o What is to be provided by the proposed task listed on (specific) page number?
  o When will proposed effort be finished?
  o Who will accomplish the proposed effort?
  o Why is the level of proposed efforts needed?
  o How does the proposed effort relate to the contract requirements?

• **Reviewing the initial questions.** After the proposal analysis is completed, the technical analyst should review initial questions to assure that the:
  o Questions do not unwittingly give away potential Government positions or other confidential information.
Analyst is completely familiar with the questions so that the analyst can concentrate on listening and verifying answers during the exchange session.

- Providing initial questions to the team leader.

**Pricing Analyst Preparation.** For most contract actions, the contracting officer or the contract specialist is the pricing analyst -- the expert who analyzes material prices, labor rates, and indirect cost rates. The cognizant auditor typically is not a member of the exchange team, but provides advice and assistance. For larger more complex contract actions, there may be a cost/price analyst assigned. For even larger contract actions, the cognizant auditor may join the team.

Pricing analyst preparation includes the following:

- **Analyzing the proposal and obtaining related information.** In particular, detailed information on rates and factors may not be contained in the proposal under analysis. Instead they may be contained in one or more forward pricing rate proposal(s). The pricing analyst must obtain enough information to analyze the proposed rates and factors used in proposal preparation. Normally, that requires close liaison with the cognizant auditor and administrative contracting officer (ACO) when one is assigned to the contractor.

- **Developing initial questions.** Questions should deal directly with each issue involved in a non-threatening way, such as:
  - How does the proposed material unit cost compare with recent contractor experience?
  - What steps were used to develop and apply the escalation factor for unit material costs?
  - What points were considered in key make-or-buy decisions?
  - What steps were used to estimate direct labor rates?
  - What steps were used to estimate indirect cost rates?

- **Reviewing the initial questions.** After the proposal analysis is completed, the pricing analyst should review initial questions to assure that the:
  - Questions do not unwittingly give away potential Government positions or other confidential information.
  - Analyst is completely familiar with the questions so that the analyst can concentrate on listening and verifying answers during the exchange session.

- Providing all questions to the team leader.

**Business Terms Analyst Preparation.** For most contract actions, the contracting officer or the contract specialist is also the business analyst -- the expert responsible for analyzing proposed terms and conditions. In fact, for most contract actions, little analysis is required at this point, because the contractor accepts the Government's terms and conditions as presented in the solicitation or contract modification. For more complex contract actions, the ACO, contract administration specialists, legal counsel, and others may be involved in analyzing proposed terms and conditions.

Preparation must center on how proposed terms and conditions will affect the contractual relationship.

- **Analyzing the proposal and obtaining related information.** Normally, the analysis will center on the legality and advisability of the proposed business terms.

- **Developing initial questions.** Normally, questions should be carefully coordinated with all Government activities affected.

- Providing all questions to the team leader.

**2.4 Conducting Face-To-Face Exchanges**

**Orientation.** The face-to-face exchange session should begin with an orientation. The contents of the orientation will typically depend on numerous factors including: the size of the Government and contractor teams participating in the exchange, the location of the exchange, the procedures for the exchange, and the complexity of the issues involved.

- **Greeting.** Create a cordial atmosphere by exchanging pleasantries and compliments. At the very
least, express appreciation to the contractor for participating in the acquisition. If you are the host, welcome the contractor team to your facility. If you are the visitor, thank the contractor for the opportunity to visit the contractor's facility.

- **Introductions.** If all the parties involved do not know each other, participants should be asked to introduce themselves and describe their role in the exchange session. If the group is large, circulate a roster to obtain a permanent record of information such as each attendee's name, job title, business address, and telephone number.

- **Facility Orientation.** If you plan a group meeting in a single conference room, the facility orientation can be limited to information such as security restrictions and the location of facilities such as refreshment areas and rest rooms. If Government team members will separate and meet with different contractor experts in different locations throughout the contractor's facility, an orientation on the entire facility may be appropriate.

- **Agenda Review.** If you plan a group meeting in a single conference room, the agenda will normally be limited to an overview of the topics to be covered and anticipated length of the exchange session. If you expect the session to continue over more than one day, you should review the projected daily schedule.

- **Session Purpose.** Emphasize that the purpose of the session is to obtain information, not negotiate.

*Exchange Interviews.* The key to the exchange process is the Government exchange interview of contractor personnel. The whole Government team can work together to conduct each interview, subsets of the team can conduct different interviews simultaneously, individual team members can conduct the interviews, or different combinations can be used for different interviews. Team members conducting an exchange interview must present a professional image, listen carefully, and actively encourage an open exchange. The basic interview skills include:

- **Questioning.** This is the backbone of the exchange interview. The best questioning style largely depends on the subject matter and the personality of the person being interviewed.
  
  - Detailed questions on specific issues are normally recommended, because of the limited time available for interviews. This can be used to get to the heart of a specific issue without unnecessary and sometimes confusing discussion.
  
  - Wide-ranging and non-directed questions can be particularly useful when the Government analyst desires to obtain broad information on contractor processes and systems. In addition, some people resent detailed questioning, because they feel they are being interrogated. As a result, they are prone to be more candid in responding to wide-ranging questions.

- **Probing.** This technique is useful when the interviewee's answers are either vague or qualified.
  
  **Probing:**
  
  - Typically involves a series of questions concerning the same issue. The initial questions are general. Each successive question is more specific and designed to elicit a more detailed response. The goal is a full and adequate answer.
  
  - May also involve asking the same question in different ways. When the answer is not satisfactory, you may rephrase it and ask it again. Alternatively, you may allow a period of time to pass before rephrasing and asking it again. This process continues until the interviewee provides an adequate answer.
  
  - May lead to interviewee frustration and anger. Do not allow a question to go unanswered. You might ask the question another way to assure clarity and understanding. If the interviewee cannot or will not answer candidly, the team leader may need to elicit contractor management support in obtaining an acceptable answer.

- **Listening.** Listening is as vital to communication as talking. Inadequate communication is too
often caused by inadequate listening. Moreover, the art of listening is of special significance during fact-finding because the purpose of the sessions is to absorb answers by listening.

- **Understanding.** Differences in language or interpretation can often lead to misunderstandings and even unintentional disputes. There are several techniques that you might consider using to assure understanding:
  - Share relevant portions of the Government's evaluation of the contractor's proposal with the contractor to demonstrate points that Government evaluators did not understand.
  - Rephrase the interviewee's statement and ask whether your interpretation is correct.
  - Use a form similar to the example on the next page to document understanding.

<table>
<thead>
<tr>
<th>Exchange Interview</th>
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<tbody>
<tr>
<td>Date: ______________</td>
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<tr>
<td>Subject: ________________________________________________________________</td>
</tr>
<tr>
<td>Government Team Member(s)</td>
</tr>
<tr>
<td>Summary (topics, questions, answers, and exhibits): ______________________________</td>
</tr>
<tr>
<td>Documents Reviewed: __________________________</td>
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<tr>
<td>Action Items: ____________________________________________________________</td>
</tr>
</tbody>
</table>

**Government Caucus.** As information is gathered, Government team members should caucus periodically to compare notes about the information obtained so far. The caucus may highlight conflicting information provided by the contractor or confirm the viability of supporting information provided by the contractor. Accordingly, a caucus may result in additional questions, confirmation of progress, or the confirmation that Government concerns about the contractor's proposal have been answered.

**Conclusion.** The face-to-face exchange should continue until both parties agree on the facts or at least one party feels that a break is necessary because the needed facts are not currently available. Neither party's position can be realistic until there is mutual understanding concerning the facts. Sessions should end with a formal conclusion where the Government team leader:
  - Summarizes the important findings during the session.
  - Identifies open issues when questions remain.
  - Asks the contractor's representative for comment.
  - Expresses appreciation to the contractor.
  - Schedules another exchange session if necessary.
  - Schedules a tentative time for negotiations, if another exchange is not needed.

**Document Results.** Document exchange results. The documentation should identify the information received and how it was used on the contracting decision process. Usually, the documentation is prepared by the team leader. However, in large complex negotiations, the team leader may designate another team member as the team recorder.

### 2.5 Using Exchange Results

**Use Depends on Purpose.** Your use of exchange results will depend on the reason for the exchange.

- **Use of Clarification Results (FAR 15.306(a)).** The results of a clarification can be considered in the award decision without negotiation. For example, if the contractor demonstrates the relevance of past experience, that experience should be considered in making the contract award decision. Unrelated experience should not be considered.

- **Use of Communications Results (FAR 15.306(b)).** The results of a communication can be considered in
establishing the competitive range. For example, if the contractor's response to adverse past performance information does not refute that information, that failure might lower the firm's overall rating enough to exclude the firm from the competitive range.

*Use of Other Exchanges Before Competitive Negotiations (FAR 15.306(d)).* The results from exchanges that take place after establishment of the competitive range but before contract negotiations, may be used to complete proposal evaluation. Those results should be considered in developing negotiation objectives.

If the exchange reveals serious flaws in the request for proposals, the contracting officer should consider amending the solicitation or canceling the solicitation and resoliciting.

*Use of Fact-Finding Results.* The results from fact-finding should be used to reevaluate preliminary prenegotiation objectives. Normally, the Government and the contractor positions should be closer together, based on the results of the fact-finding.

During the fact-finding, the Government team should have:

- Obtained a mutual understanding with the contractor on the pertinent facts pertaining to the offer;
- Tested the validity of the issues and positions identified prior to the exchange;
- Verified the facts presented in the proposal;
- Verified or refuted proposal assumptions; and
- Identified the contractor position on key negotiation issues and the relative importance of each position.

3.0 *Chapter Introduction*

3.1 *Tailoring The Negotiation Team To The Situation*

3.2 *Identifying Negotiation Issues And Objectives*

3.3 *Identifying The Contractor's Probable Approach To Negotiation*

3.4 *Assessing Bargaining Strengths And Weaknesses*

3.5 *Identifying Negotiation Priorities And Potential Tradeoffs*

3.6 *Determining An Overall Negotiation Approach*

3.7 *Preparing A Negotiation Plan*

3.8 *Presenting A Negotiation Plan To Management*

3.9 *Preparing A Negotiation Agenda*

**3.0 Chapter Introduction**

*Procedural Steps.* The following flow chart outlines the steps in negotiation preparation:
Need for Preparation. Thorough preparation is the most important prerequisite to effective negotiation. Neither experience, bargaining skill, nor persuasion on the part of the negotiator can compensate for the absence of preparation.

- In general, thorough preparation improves the likelihood of a win/win negotiation that will produce a quality contract and set the foundation for timely and effective contract performance.

- Specifically, thorough preparation produces tangible rewards, including:
  - Fewer contract modifications because the technical requirements are well conceived and well defined;
  - Better technical performance because requirements were well defined; and
Cost estimates closer to actual contract costs.

Contractor Preparation. Structure is forced upon the contractor by the proposal preparation process. To complete an effective proposal, the contractor must:

- Understand contract requirements before beginning proposal preparation;
- Establish and use an estimating system designed to meet contractor and Government requirements;
- Identify assumptions related to contract performance (e.g., current competition, market alternatives, possible performance problems, and effect of the market on contract costs);
- Evaluate performance alternatives and determine the most effective way to meet contract requirements; and
- Structure a proposal to meet Government technical and pricing requirements.

Government Preparation. To be effective in negotiation, the Government’s preparation must mirror the depth and intensity of the contractor’s. Thoroughness is important because contractors are typically well prepared. Government representatives must:

- Conduct market research to understand the product, the technical factors affecting contractor performance, and the market factors affecting product price;
- Prepare or review contract documents (e.g., solicitation, contract, or contract modification) considering the current market situation;
- Analyze the contractor’s proposal based on the current market situation and specific contract requirements:
- When necessary, use exchanges to clarify information received from the contractor and support further analysis; and
- Develop a negotiation plan based on that analysis.

Available Information. Without adequate information, you can neither prepare for nor conduct effective contract negotiations. As you prepare for contract negotiations, you should already have:

- The solicitation, unilateral contract modification, or any other document that prompted the contractor’s proposal;
- The proposal and all information submitted by the contractor to support the proposal;
- Information from your market research concerning the product, the market, and any relevant acquisition history;
- Any relevant field pricing or audit analyses;
- In-house technical analyses;
- Your initial analysis of the proposed price and, where appropriate, of the different cost elements.
- The results of any exchange(s) with the contractor.

3.1 Tailoring The Negotiation Team To The Situation

Potential Team Size. Normally, you should use the smallest team practical to efficiently and effectively formulate and attain the Government negotiation objectives. For smaller less complex contract actions, the contracting officer or contract specialist may be the only Government representative participating in the negotiation. As the value and complexity of the contract action increase, you will likely need additional experts. However, a smaller team is normally better unless the additional member(s) can make an effective contribution. As the team size grows:

- Team control during negotiations becomes more difficult;
- Team communications become more complex; and
• The personnel cost associated with the negotiation increases.

*Potential Team Members.* The table below identifies common roles in negotiations and potential team members to fill those roles. Note that the roles and potential team members are identical to those identified for face-to-face exchanges. However, you should also note that actual team membership on the two teams may be substantially different.

<table>
<thead>
<tr>
<th>Negotiation Team Selection</th>
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<tbody>
<tr>
<td><strong>Team Role</strong></td>
</tr>
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</table>
| Team leader                 | • Contracting officer  
                            | • Contract specialist                                      |
| Technical analyst           | • Engineer  
                            | • Technical specialist  
                            | • Project or requirements manager  
                            | • End user  
                            | • Commodity specialist  
                            | • Inventory manager  
                            | • Transportation manager  
                            | • Property manager  
                            | • Logistics manager                                      |
| Pricing analyst             | • Auditor  
                            | • Cost/Price Analyst                                       |
| Business terms analyst      | • Legal Counsel  
                            | • Administrative Contracting Officer  
                            | • Administration Specialist                              |

*Team Leader.* In contract negotiations, the ultimate team leader is the contracting officer responsible for the contract action. The contracting officer has ultimate responsibility for the negotiation, because only the contracting officer has the authority to bind the Government to a contract. The contracting officer may act as the day-to-day team leader or delegate that responsibility to a contract specialist after considering factors such as the:

• Dollar value of the contract action;
• Complexity of the issues involved in the negotiation;
• Contractual and operational importance of the contract action;
• Policy of the contracting activity; and
• Experience of the assigned contract specialist.

*Principal Negotiator.* The principal negotiator is the person who represents the Government during contract negotiations and does most of the bargaining. The team leader is normally the principal negotiator because the team leader has the broadest perspective of key negotiation issues. However, the team leader may designate others to fill the role of principal negotiator.
Another individual may be designated as the principal negotiator because of that person's particular expertise in analysis and negotiation. For example, a price analyst may be designated to serve as the principal negotiator when the price analyst is the most informed and capable negotiator. Of course, the team leader is still responsible for the results of the negotiation.

To take advantage of varying kinds of expertise, different principal negotiators can be used to bargain different issues. For example, an engineer might negotiate technical issues (e.g., labor hours) while a price analyst negotiates indirect cost rates. When using this approach the team leader must be particularly vigilant to assure that the various negotiators share information and work toward the same objectives.

Other Team Members. Individuals should only be selected for team membership when they can add to the efficiency and effectiveness of team efforts to formulate and attain negotiation objectives. In particular, additional team members may be required when their expertise is needed to:

- Support Government efforts to understand the contractor's position; or
- Explain the Government position.

Questions and responses on key issues generally continue throughout the negotiation process. Expert support:

- Is generally only needed until the differences between the Government and contractor positions are clearly defined. After that, expert support may actually be detrimental to the negotiation. The experts on both sides may be so convinced that their position is correct that they will consciously or unconsciously sabotage any efforts at compromise.
- May be needed throughout the negotiation whenever certain very important and very complex issues are discussed. Mutual understanding on such issues may be critical for successful contract performance.

3.2 Identifying Negotiation Issues And Objectives

Identifying Issues. An issue is any assertion about which the Government and the contractor disagree. In contrast, nonissues are assertions about which both parties agree. Typically, issues arise when the Government and the contractor make different assertions based on the same or related facts. Differences occur because the two parties have different perspectives and interests in the negotiation.

- A nonissue can become an issue if it is challenged during the course of negotiations.
- An issue can become a nonissue if the assertion is no longer challenged.

Sources of Issues. In contract negotiation, an issue can come from any challenge to an assertion made by the contractor or the Government. Generally, an assertion made in the contractor's proposal is challenged based on:

- The field pricing report;
- The audit report;
- The in-house technical analysis;
- Your cost or price analysis;
- Exchanges with the contractor; or
- Another type of Government analysis.

The issue may also be related to a contractor challenge of Government requirements as stated in the solicitation, contract, or contract modification.

Issues and Objectives. Issues are the bases for the differences between the Government and contractor negotiation positions. For example, the positions on labor rates might differ because the Government challenges the contractor's use of a particular labor index to estimate future direct labor rates. Because issues are the bases for differences between the Government and contractor positions, you must identify the key issues that effect those positions before you develop your prenegotiation objectives. If you do not, there is a good chance that your objective on one issue will not be consistent with your
objectives on related issues. For example, if the Government challenges the use of a particular index to forecast direct labor rates, that challenge should affect all similar rates estimated under similar conditions. **Prenegotiation Objectives** (FAR 15.101). Your objective in any contract negotiation should be best value for the Government.

- In a competitive negotiation, the objective in negotiating with each contractor should be a final proposal revision that provides the best value based on the contractor's proposal, the solicitation criteria, and the conditions affecting the contractor's operations. The Government can then award a contract to the firm whose proposal provides the overall best value.

- In a noncompetitive negotiation, best value is a contract with a responsible source that:
  - Will satisfy Government requirements in terms of product quality and timely delivery;
  - Has a fair and reasonable price;
  - Fairly apportions risk between the Government and the contractor; and
  - Satisfies Government socioeconomic goals (e.g., small business set-asides).

**Technical Objectives.** Government technical objectives are based on Government's requirements and its evaluation of the contractor's technical proposal based on those requirements. Technical objectives should center on whether the contractor can effectively and efficiently meet Government requirements. Typically, technical objectives deal with the:

- Acceptability of the contractor's technical proposal. For example, the Government may maintain that a larger motor is required to meet an equipment requirement.

- Performance risk associated with the contractor's technical proposal. For example, the technical proposal may propose to perform the required service with individuals who may not be qualified.

- Technical factors that may unreasonably affect cost -- often referred to as "gold plating." For example, the contractor may be proposing stainless steel nails to build wooden cabinets. Common nails would work just as well at a fraction of the cost.

**Cost or Price Objectives.** Issues related to technical issues and issues related to rates and factors will eventually effect cost and price objectives, because the "total package" under consideration will in part determine what price is fair and reasonable.

Whether your negotiation involves price analysis supported by cost analysis or price analysis alone, you must establish an overall price objective. Without an overall price objective, negotiations will often flounder and result in settlements that can be neither explained nor defended. Negotiating cost element by cost element can be risky unless you understand the affect of these agreements on overall price. Objectives such as "the lowest price we can get" or "a price about ten percent lower than the proposed price" do not qualify as acceptable objectives because they are not in the win/win spirit and are too vague. Price objectives should be planned in terms of a definite dollar amount reflecting a reasonable evaluation of contract requirements and the methods proposed by the contractor to meet those requirements.

**Objectives May Change During Negotiation.** Your prenegotiation objectives represent your best judgment based on the information available prior to negotiations. As more information becomes available, your objectives may change.

When you must obtain management approval of your negotiation objectives, that approval should address the latitude that you will have to adjust your objectives during negotiations. Depending on your contracting activity's policies and the situation, you may have complete latitude or you may be required to obtain a new approval any time your objectives change. A requirement for a new approval is most likely when a change in your objectives will probably lead to a higher contract price.

### 3.3 Identifying The Contractor's Probable Approach To Negotiation

**Need to Identify the Contractor's Approach.** You have identified issues and the objectives that will drive the negotiation. Now you need to learn more about the contractor's objectives and the road map that the contractor's negotiator will likely follow in attaining those objectives.

**Information Sources.** Information on how the contractor might approach the negotiation can come from a wide variety of sources. Some of the most important include the following:
The contract proposal and all information submitted with the proposal should clearly explain the contractor's approach to contract performance and contract pricing.

- A well supported proposal may indicate that the contractor expects to negotiate a contract close to the proposal.
- Minimal support may indicate that the contractor is not firmly committed to negotiating a contract.
- Poor support may mean that extensive negotiations will be required to attain a quality contract.

Previous proposals and contracts for identical or similar products may give you an idea about how flexible the contractor is during negotiations. Many contractors expect to lose a certain percentage of the proposed price during negotiations. To compensate, they may include "padding" in their proposals so that they can negotiate it away and still have an acceptable contract.

Price negotiation memoranda (PNMs) with the same contractor for similar work should provide detailed information on where the contractor is likely to be flexible in negotiations and where the contractor is likely to be firm.

Contract administrators, negotiators, and other Government employees who have had previous dealings with the contractor can provide more personal information on the company's negotiating style and the approach taken by individual negotiators.

Information from exchange sessions may indicate where the contractor's position is firm and where the contractor may be more flexible.

Other information from contract files may indicate how proposals compare with contract performance. For example, during negotiation, the contractor may constantly point out the high risk in performing certain contract activities. Then immediately after contract award, the contractor uses a firm fixed-price subcontract to shift that risk to a subcontractor.

**Key Questions to Consider.** As you collect information on how the contractor might approach the negotiation, ask yourself the following questions:

- What objectives and priorities has the contractor probably established for the contract negotiation?

Identify the contractor's contract objectives and related priorities. Consider stated and readily apparent objectives along with the contractor's unstated needs. While contract price is always important, every negotiation includes non-price objectives.

- How will the contractor's general business objectives and priorities affect the negotiation?

Determine how the proposed contract action will affect the contractor's ability to meet its general business objectives. Most contractors look at a contract as part of the firm's sales mix. Each contract has its own requirements and potential rewards, but is also related to the other business of the firm. Possible objectives might include increasing market share, entry into a new field, improved cash flow, avoiding unnecessary cost risk, or continued Government business.

- How will the individual objectives and priorities of the contractor's negotiator affect negotiations?

Identify factors that may cause the negotiator's objectives and priorities to differ from those of the contractor. For example, a new negotiator may feel a need to prove his/her capabilities by refusing to compromise. A negotiator who receives an incentive based on the profit/fee rate negotiated, may be willing to concede costs dollars to keep that profit/fee rate high.

- What negotiation styles and tactics will the contractor's negotiator likely use?

Collect information about how the contractor and the projected negotiator have negotiated in the past.

- Company negotiation strategy and tactics will affect negotiations no matter who represents the firm. For example, some contractor's may have a policy of providing the minimum price-related information possible to the Government. If you need more price-related information to determine
price reasonableness, that policy may limit your ability to obtain it.

- A particular negotiator's style can also be important. For example, if the negotiator is prone to use win/lose tactics, you should consider the use of effective countermeasures to put the negotiation on a win/win path.

- What pressures and constraints will affect the contractor's approach to negotiations?

Learn what pressures and constraints will affect negotiations. For example, some contractor's give negotiators little or no latitude in negotiation. Such restrictions can make it difficult to reach agreement. Early knowledge of this restriction may permit you to use a win/win approach to encourage the contractor to give the negotiator the flexibility needed to reach an agreement.

### 3.4 Assessing Bargaining Strengths And Weaknesses

#### Bargaining Power

Bargaining power is relative. It comes in many forms and is never totally one-sided, because both parties have bargaining strengths and weaknesses. Recognizing the relative strengths and weaknesses of the parties involved in any negotiation will help you achieve a win/win result.

- The Government may have bargaining power because it is the only customer for a particular product. However, that power may be offset because the contractor is the only supplier.

- A world-renowned scientist may have bargaining power based on expertise and reputation. However, an experienced technical analyst may be able to offset much of that power.

- Contractors often enjoy bargaining power because the Government lacks knowledge about the existence of potential competitors or substitute products. However, the Government negotiator's knowledge of Government requirements may offset that power.

- An experienced negotiator may have bargaining power because of a reputation gained over the years. However, knowledge of the negotiator's approach to negotiation may offset much of that power.

#### Bargaining Power and Perception

**FAR 31.201-3(a) and FAR 52.243-1.** Bargaining power has to be perceived by the other party to have an effect on negotiations. In fact, the power does not have to be real as long as it is perceived. For example, many Government negotiators believe that contractors have far superior bargaining power in negotiations to definitize a unilateral contract modification. They point out that the contractor can drag out negotiations while continuing to perform the modified contract and incurring actual costs. However, they do not realize that the Government also has substantial power in that situation. Contracting officers are prohibited from accepting unreasonable actual costs. If an agreement cannot be reached, the contracting officer can make the equitable adjustment by using a unilateral decision. Of course, the contractor can dispute that decision, but it will likely take months or years before the dispute is resolved. Legal fees may be more than the disputed amount. Obviously, a negotiated agreement is in the best interest of both the Government and the contractor.

#### Sources of Bargaining Power

The following are some of the factors that you should consider as you assess the bargaining strengths and weaknesses of each party involved in a particular negotiation:

- **Competition.** The availability or lack of competition may give one side the upper hand.
  
  - Sellers enjoy more bargaining power when available sources or alternatives are limited.
  
  - Buyers enjoy more bargaining power when multiple sources or alternatives are available. Bargaining alternatives exist even during sole source negotiations. The Government may be able to gain bargaining strength by researching the practicality of other alternatives, such as:
    
    - Performing the required effort in-house;
    
    - Changing requirements to encourage competition;
    
    - Developing new source(s) by providing start-up funds to other contractors;
    
    - Postponing contract award until other sources become available; or
    
    - Breaking out and separately competing components.
• **Knowledge.** The cliché "Knowledge is power" certainly applies to contract negotiation. The more that you know about the negotiation issues, objectives, priorities, and the parties involved, the greater your bargaining power. Thorough preparation is essential.

• **Time Constraints.** Time constraints affect every negotiation (e.g., time available for negotiations, time available for contract completion, date when work must start, or the expiration of funding). Time constraints become a source of power when the constraint appears to affect one party and not the other. Do not be fooled though. A time constraint that appears to affect only one party may actually affect both. For example, expiring funds place a constraint on the Government. If the contractor has substantial business alternatives, the time constraint on the Government may give bargaining power to the contractor. However, if the contractor needs the contract, the time constraint applies equally to both parties. Relative bargaining power is not affected.

• **Bargaining Skills.** Many contractors have personnel that specialize in contract negotiation. Their bargaining experience and expertise can give them both the perception and the reality of bargaining power. However, applying the concepts presented in this text should improve your bargaining skills and your confidence in your ability to negotiate effectively. Your bargaining power should increase accordingly.

• **Importance of the Contract to Each Party.** As the table below shows, successful negotiations can reward both the organization and the individual. The importance of the Government contract to each side is determined by how much the rewards benefit the organization and the individual participants.

<table>
<thead>
<tr>
<th>Organizational Rewards</th>
<th>Individual Rewards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money/Profit</td>
<td>Increased Self-Worth</td>
</tr>
<tr>
<td>Unique Product or Service</td>
<td>Safety</td>
</tr>
<tr>
<td>Property</td>
<td>Prestige</td>
</tr>
<tr>
<td>Information Rights</td>
<td>Self-Esteem</td>
</tr>
<tr>
<td>Privileges</td>
<td>Self-Actualization</td>
</tr>
<tr>
<td>Commercial Opportunities</td>
<td>Security</td>
</tr>
<tr>
<td>Future Business</td>
<td>Reputation</td>
</tr>
<tr>
<td>Product Control</td>
<td>Increased Pay</td>
</tr>
</tbody>
</table>

As with other forms of bargaining power, perception is the key. If a negotiator perceives that a contract is more important to the other party, the negotiator may be less willing to make concessions.

• **Contract Risk.** Every contract involves risks and both the Government and the contractor have an interest in assuring that those risks do not preclude effective and efficient contract performance. However, one negotiator may gain power by taking action to reduce the risk exposure perceived by the other party. That power can be real, even if the negotiator taking the action does not perceive the same level of risk.

• There are many methods that you should consider for reducing and controlling contract risk. Among the most important are the appropriate use of:
  • Fixed-price or cost-reimbursement contract pricing arrangements;
  • Clear technical requirements;
  • Government furnished property; and
  • Other contract terms and conditions.

• While you can reduce or control contract risk you cannot eliminate it completely. Trying to eliminate risk entirely may actually weaken your bargaining power by presenting an image of weakness rather than an image of cooperation.

### 3.5 Identifying Negotiation Priorities And Potential Tradeoffs

*Prioritize Issues.* Rank potential negotiation issues in relative order of importance to the Government.
After ranking, determine whether each issue is:

- **Nonnegotiable issues or "must points."** These are the issues where you cannot make concessions because of their importance to the Government position.

- **Issues open to concession or "give points."** These are issues that have relatively low importance to the Government but may be valuable to the contractor. As a result, they are projected for probable concession during negotiation. Hopefully concessions on these issues will win concessions from the contractor.

- **Issues to avoid during negotiations or "avoid points."** These are issues that you do not want to discuss during contract negotiations. For example, they may be controversial or weak areas in the Government position.

- **Issues open to bargaining or "bargaining points."** These are issues where the Government may be willing to make meaningful concessions in return for meaningful concessions by the contractor. For example, in a noncompetitive negotiation, price is a bargaining point. The Government and contractor typically reach agreement on a dollar value somewhere between the two opening bargaining positions.

**Need for Tradeoff Positions.** You should have an objective for each negotiation issue. You should also identify several tradeoff positions that you would consider accepting.

- In a competitive negotiation, you can use these positions to evaluate the contractor's final proposal revision.

- In a noncompetitive negotiation, you can use these positions to develop counteroffers and establish your negotiation limits.

**Tradeoff Positions.** As you identify tradeoff positions for each issue, there are three questions that you should consider.

- What result do you feel is most reasonable based on the available information?

  Use your answer to establish your negotiation objective.

  - What is the most desirable result that you could reasonably expect to achieve on this issue?

  Use your answer to establish one limit to your range of acceptable tradeoffs.

  - What is the least desirable result that you would be willing to accept on this issue?

Use your answer to establish the other limit to your range of acceptable tradeoffs.

**Tradeoff Positions On Price.** Price is an issue that must be considered in every contract negotiation. Many contracting activities consider tradeoff positions on price so important that they require negotiators to obtain management approval of their minimum, objective, and maximum positions on price prior to the start of all major noncompetitive contract negotiations.

- **Objective Position.** This is your best estimate of a fair and reasonable price based on your price/cost analysis. It is the price that you want to negotiate. Other positions should help you reach your objective.

- **Minimum Position.** In a win/win negotiation, your minimum price should be the lowest fair and reasonable price. When used as your first counteroffer, your minimum position should provide room to negotiate. Never offer a price lower than your minimum position, because such an offer would be unreasonable.

  - Establish your minimum position based on a reasonable price for your anticipated best-case scenario of contract performance. That scenario must be based on a reasonable analysis of available information. It must not be based on an unlikely “pie in the sky” scenario.

  - The use of an arbitrary “nice low figure” as a minimum position is neither appropriate nor defensible. Using an arbitrarily low minimum position is not in the win/win spirit and may even be counterproductive. For example, an indefensible or unreasonable opening position may cause the Government to lose credibility and make attaining a win/win outcome difficult or even impossible.
When you use cost analysis, you should establish a minimum position for each major element of contract cost and profit/fee.

- **Maximum Position.** In a win/win negotiation, your maximum price should be equivalent to the highest fair and reasonable price.
  - Establish your maximum position based on a reasonable price for your anticipated worst case scenario of contract performance. That scenario must be based on a reasonable analysis of available information and not an unrealistic scenario.
  - There may be other limits (e.g., the availability of funds or a ceiling price) on the maximum contract price. Such limits provide a defensible maximum position even though the amount is less than the highest price that could be considered fair and reasonable.
  - When you use cost analysis, you should establish a maximum position for each major element of contract cost and profit/fee.

*Tradeoff Positions On Other Issues.* Price is not the only important issue in contract negotiation. In most contract negotiations, you will also need to develop tradeoff positions for several other key issues, such as:

- Contract type;
- Warranties;
- Delivery schedule; or
- Other business terms and conditions

*Base Tradeoff Positions on Clear and Consistent Criteria.* A win/win outcome is practically impossible if negotiation positions are not based on clear and consistent criteria. Remember that a win/win outcome is a mutually satisfactory outcome and a mutually satisfactory outcome is a matter of perception. The best way to maintain the perception of a mutually satisfactory outcome over the long term is to base your positions on clear and consistent criteria. Without clear and consistent criteria, the negotiation will almost certainly turn into a win/lose or lose/lose situation.

- Negotiators will be encouraged to use win/lose tactics.
- The party that stubbornly refuses to concede anything will usually win. If both parties refuse to move, both sides will lose.
- Even if the outcome is fair and reasonable, one-or-both could eventually feel that they were treated unfairly.

3.6 Determining An Overall Negotiation Approach

*Plan the Order for Addressing Issues.* Carefully plan the order in which issues will be addressed during negotiations. There is no one right approach.

- One approach is to start with the least important issues and proceed to the more important ones. Concessions on several less important issues may limit or eliminate the need for concessions on a more important issue.
- Another approach is to address issues according to the anticipated ease of reaching agreement. Early agreements hopefully will create an atmosphere of agreement that will continue as you proceed to the harder issues.
- Normally, contract negotiations follow a building-block approach:
  - Basic contract requirements are addressed and resolved before contract price is addressed.
  - Tradeoffs between contract requirements and contract price are addressed after resolution of other technical issues.
  - Contract price is not finally resolved until all other issues are settled, because contract
price must consider all the other elements of the contract. The result should be a fair and reasonable price for each contract item, not an element-by-element agreement on contract costs.

*Identify Potential Concessions.* Flexibility is vital to win/win negotiations. Negotiators expect to gain something as a result of their negotiation efforts. Refusing to make concessions will frustrate the other negotiator and may lead to a lose/lose situation, no matter how reasonable your position. A concession may be accepting a different interpretation of existing facts (e.g., accepting that production hours per unit will not be reduced as fast as you estimated in your previous pricing position) or it may be an action to change the facts (e.g., change the contract type). As you consider possible concessions, you should identify:

- Potential concessions that you would be willing to make in response to projected contractor concessions.
- Concessions that you would expect from the contractor in response to your potential concessions.

*Plan Bargaining Tactics.* Your selection of negotiation tactics should depend on your personality and the results of your research on the tactics that will probably be used by the contractor’s negotiator.

- Avoid the use of win/lose tactics. Government negotiators should always pursue a win/win outcome.
- Do not try to be someone you are not. A tactic that works well for another negotiator may not work for you. However, that does not mean that you should never try something new.
- The successful application of any negotiation tactic requires a great deal of planning. The negotiator must be prepared to respond in a manner that protects the Government and makes progress toward agreement. This preparation is accomplished by anticipating the probable contractor tactics and developing countermeasures in advance.

### 3.7 Preparing A Negotiation Plan

*Draft a Plan.* Draft a negotiation plan. Contents may vary based on agency and contracting activity requirements, but the plan should include information such as the following:

- Background (e.g., contract, contractor, and negotiation situation);
- Major and minor negotiation issues and objectives (both price and non-price);
- Negotiation priorities and positions on key issues (including minimum, objective, and maximum positions on price); and
- Negotiation approach.

*Review the Plan.* Review the negotiation plan with key negotiation team members.

- Present the plan to the team.
- Encourage input from others on the team to identify weaknesses and alternatives. Normally, you should give special attention to input from those with more experience in negotiations with the same contractor.
- Revise the plan as necessary.
- Define the role each team member will play in putting the plan into action.
- Ensure positions and the overall plan are fair and reasonable.

*Team Member Plans.* Assure that team members have individual plans designed to support the overall negotiation plan.

- Emphasize:
  - The Government’s commitment to a win/win approach to contract negotiation
  - That the Government’s principal negotiator’s role is the principal speaker and "chairperson" of the Government team. Other team members must realize that the
principal negotiator is the only individual authorized to negotiate with the contractor.

- That other team members are at the negotiation to provide support, listen, and evaluate information provided by the contractor. They must not address the contractor's negotiator(s) unless directed by the Government's principal negotiator.

- That, during negotiation sessions, other team members must not openly disagree with the Government position on any point under discussion. If they have a concern, they should discretely communicate with the principal negotiator. If necessary, the principal negotiator could call for a caucus to address the concern.

- Assure that each team member understands his/her specific role in the negotiation session.
  - Identify any issue that the team member should be prepared to address during negotiations.
  - Assure that the team member understands the related Government position.
  - Review their anticipated role (e.g., present the Government position, answer contractor questions about that position, or both).

- For all negotiations, warn team members:
  - Not to communicate with contractor personnel outside the negotiation conference on issues related to the negotiation.
  - To safeguard information on the Government position from contractor personnel and other unauthorized persons.
  - About ethical considerations (e.g., no free lunches or favored treatment).

- For competitive negotiations, warn team members not to engage in conduct that:
  - Favors one contractor over another;
  - Reveals a contractor's technical solution, including unique technology, innovative and unique uses of commercial items, or any information that would compromise a contractor's intellectual property to another contractor;
  - Reveals a contractor's price without that contractor's permission;
  - Reveals the names of individuals providing reference information about a contractor's past performance; or
  - Knowingly furnishes source selection information to anyone other than Government personnel who have a need to know.

3.8 Presenting A Negotiation Plan To Management

Need for Management Support. To be successful in a contract negotiation, you must have management support. If management does not support you, other members of the Government negotiation team and the contractor will soon know. When this happens, team members and the contractor will no longer come to you for guidance and answers. Instead, they will go to management.

You should have continuing communications with management, just as you do with the contractor and members of the negotiation team.

- For contracts that attract a relatively low level of management interest (e.g., small dollar contracts with no major issues), communications will likely center on available funding, workload, and other general management concerns.

- For contracts that attract higher-level management interest, communications should center on the key issues involved. Typically, these communications will involve a briefing on key elements of the negotiation plan, especially the team's negotiation objectives.

Management Briefing. A management briefing gives you an opportunity to obtain policy guidance and management observations on the strengths and weaknesses of the negotiation plan. In fact, multiple
briefings may be required to involve different levels of management in the negotiation process. The prenegotiation briefing can take many forms, including:

- An informal oral presentation;
- A formal oral presentation; or
- A written document (e.g., a prenegotiation or business clearance memorandum).

The actual briefing format will depend on many factors including agency policy, contracting activity policy, and the personalities involved. For example, some managers may feel that they can better evaluate an oral presentation, while others may want the detail a written business clearance provides.

Management Feedback. Whatever the form of the prenegotiation briefing, there must be provision for management feedback. In particular management should have the opportunity to:

- Approve or reject the negotiation plan.
- Identify any management limits on negotiation flexibility. The negotiation team must know what happens if the team changes its evaluation of one or more key issues during negotiation (e.g., a price higher than the original objective now appears reasonable). The team might be:
  - Empowered to negotiate any position as long as the contracting officer considers the position fair and reasonable;
  - Empowered to negotiate a position within specific limits approved by management; or
  - Limited to the prenegotiation positions specifically approved by management.
- Approve or reject changes to the plan that will permit the team to exceed any previously-established management limit.

3.9 Preparing A Negotiation Agenda

Need for an Agenda. One of the most difficult tasks during a negotiation is to confine the discussion to what is important while avoiding irrelevant subjects. One of the best ways to promote productive and efficient discussion is to establish an agenda for both sides to follow.

Timing. Whenever practical, you should prepare a draft agenda for contractor review prior to the start of contract negotiations. This gives the contractor an overview of what the Government feels is important and provides the contractor an opportunity to recommend changes. Some negotiators prefer to wait until the start of negotiations to present the agenda. Though often appropriate, this may delay the start of meaningful negotiations while the agenda is being addressed. Negotiations may be further affected if the contractor is not prepared to discuss key issues identified in the agenda.

Prepare Negotiation Agenda. The negotiation agenda should include the following items:

- Topics to be addressed and the order in which they will be considered;
- A general time schedule for the negotiation sessions;
- Location(s) of the negotiation session(s).
- Names and titles of Government and contractor team members. Include office symbols and phone numbers when appropriate.

- 4.0 - Chapter Introduction
- 4.1 - Recognizing The Steps Of Negotiation
- 4.2 - Recognizing Differences Between Pre- And Post-Award Negotiations
  - 4.2.1 - Recognizing Special Considerations For Equitable Adjustments
  - 4.2.2 - Recognizing Special Considerations For Termination Settlements
- 4.3 - Identifying Documentation Requirements

4.0 Chapter Introduction

Noncompetitive Contract Negotiations (FAR 15.306(d)). Noncompetitive contract negotiations are exchanges that take place between the Government and a single contractor. They may take place before or after contract award. The pattern of negotiations can vary significantly depending on the number, magnitude, and complexity of the issues involved, as well as the personalities of the negotiators. For example,

- The time required to complete negotiations can vary from a few minutes to several months.
- The number of negotiation sessions can vary from one to twenty or more.
- A single negotiator may preside at every negotiation session or different negotiators may take the lead in addressing different issues.

Procedural Steps. The following flowchart outlines the information presented in this chapter:

4.1 Recognizing The Steps Of Negotiation

Principal Negotiator Responsibilities. The principal negotiator must assume Government negotiation team leadership responsibility during the negotiation conference even if the principal negotiator is not the team leader at other times. This includes:

- Actively leading the team throughout the conference;
- Opening the negotiation conference;
- Obtaining any additional facts needed to support continued proposal analysis and negotiation;
• Reviewing facts and identifying negotiation issues;
• Bargaining on the issues;
• Reaching agreements on the issues; and
• Closing the negotiation conference.

_Actively Leading the Government Team._ The negotiation team must be more than a group of individuals representing the Government. From the beginning of the negotiation conference, the team must function as a single entity. This requires preparation before the negotiation conference and active leadership throughout the conference.

• **Assure That Preparations Are Complete Before Opening the Negotiation Conference.** Before every negotiation session assure that all necessary preparations are complete. In particular, you should assure that the meeting room is properly set up and that team members are available and prepared to perform their assigned roles in implementing the negotiation plan.

• **Assure That Team Support Is Available When Needed.** Normally, the number of Government team members participating in any negotiation session should be as small as practical, but large enough to provide the support required.
  o Consider having the entire team present for the opening of negotiation. This permits everyone to hear the opening comments and participate in the introductions. It also visually demonstrates that the Government position is a team position, not your personal position.
  o For other sessions, you should only include team members whom you expect will actively participate in the session. If you expect to discuss direct material, why have the direct labor expert present? The direct labor expert will likely contribute little to the session, but will be unable to perform other duties while sitting at the negotiation table.

• **Control Team Member Participation.** Exercise the positive control necessary to ensure effective communications while presenting a unified position to the contractor's team.
  o Ask for support when you need it to clarify or emphasize a negotiation position.
  o Interrupt when team members enter into an uncontrolled discussion with the contractor. For example, you might say "I'm going to interrupt you because I think we're getting off the track" or "I'm a little unclear on this point myself, and I'd like to discuss this privately with the team before we continue."
  o Do not permit side conversations between team members and the contractor's team. The noise from side conversations interferes with the negotiation exchange. There is also a good chance that the team member involved could say things that appear to conflict with the Government position.

• **Use Caucuses to Maintain a Unified Government Position.** In negotiations, a caucus is a team meeting to review and, when appropriate, adjust the team position.
  o Use a caucus when you need to:
  o Consult with other team members either in person or by telephone.
  o Restore your control of team participation in the negotiation.
  o Divert the negotiations from sensitive issues or areas of weakness. After the caucus resume negotiations on a different subject.
  o Emphasize to team members that they should request a caucus if you appear to have missed an important point or it appears that you are not taking advantage of a negotiation opening provided by the contractor's team.
  o Hold your caucus in an area away from the contractor's team.
For a short caucus (e.g., 30 minutes or less):

- Move to another room if possible.
- If another room is not available, consider asking if the contractor's team would allow you to use the negotiation conference room in private for the caucus.
- If necessary, caucus in the hallway or some other place where you can prevent others from listening.

For a longer caucus, suggest that both teams break from negotiations and return at a preset time.

- **Use Breaks to Relieve Tension and Control the Pace of Negotiations.** A break provides both teams time away from the conference table, as well as an opportunity to privately assess new information and reevaluate the team's position.
  - You may call for a break anytime. You might take a:
    - Short break to provide an opportunity to go to the rest room and get some refreshment; or
    - Longer break in conjunction with lunch; or
    - A still longer break overnight, over a weekend, or even over several weeks.
  - Consider calling a break when you want to:
    - Provide relief from the stress of the negotiation;
    - Give the contractor's negotiator an opportunity to reevaluate the contractor's position or consider a possible concession;
    - Help restore a cordial and unemotional atmosphere after someone has made a provocative or emotional statement; or
    - Calm down an individual who has become contentious.

*Opening the Negotiation Conference.* The opening negotiation session is critical, because it sets the stage for the rest of the negotiation conference. It can positively or negatively influence the attitudes that will prevail throughout the conference and significantly affect the probability of a win/win agreement.

- **Greet the Contractor's Team.** Extend a cordial greeting to members of the contractor's negotiation team.
  - Welcome team members as they arrive;
  - Shake hands with all team members if practical;
  - Create a cordial atmosphere by exchanging pleasantries and compliments. At the very least, express appreciation for the contractor's support in the acquisition process.

- **Take Time for Introductions.** Introductions may not be necessary if all the participants know each other. Otherwise, the few minutes required for introductions will pay dividends throughout the negotiation.
  - You may introduce each Government team member yourself or you may have team members introduce themselves. Each introduction should include full name, title or position, and the person's role in the negotiation.
  - Suggest similar contractor team introductions.
  - To help participants remember each others' names, consider providing an attendance roster or nameplates for all team members at the conference table. If the nameplates have been prepositioned on the table, allow time for the contractor's team to rearrange seating in accordance with their seating preference.

- **Help Attendees Feel More at Ease.** Casual conversation often dispels the tension present during every negotiation and helps attendees feel more at ease.
• **Briefly Review Background Information.** Facilitate mutual understanding, by reviewing information related to the contract action under negotiation. In particular, identify any unusual constraints (e.g., imminent expiration of funds) that may affect the negotiation process.

• **Emphasize the Goal of a Win/Win Outcome.** Point out the Government's interest in fairness and a win/win result. Indicate that you assume that the contractor shares that interest.

• **Review the Negotiation Agenda.** Briefly, review the negotiation agenda. When appropriate, provide a written copy for each participant. Then ask for comments from the contractor team. Specifically ask if there are any items that need to be added to the agenda.

**Reviewing Facts And Identifying Negotiation Issues.** Review contract requirements and the contractor's proposal to assure that you have identified key negotiation issues.

• **Pay Special Attention to Areas Where Issues Are Common.** Ensure that both parties have the same understanding of the:
  - Required contract effort;
  - Contract terms and conditions;
  - Exceptions to Government terms and conditions proposed by the contractor; and
  - Facts, assumptions, and judgments submitted by the contractor as part of its proposal.

• **Summarize the Results of Any Prenegotiation Exchange.** If an exchange preceded the formal negotiation conference, summarize the results of that exchange.

• **Conduct Additional Fact-Finding When Necessary.** Before proceeding with the negotiation conference ensure that both parties feel that the general facts and issues are clear.
  - If the general facts and issues are not clear, conduct additional fact-finding before opening negotiations. Fact-finding should follow the same general guidelines used for conducting prenegotiation exchanges.
  - Fact-finding does not necessarily end once bargaining begins. Additional fact-finding may be necessary whenever additional issues arise.

• **Summarize Areas of Agreement and Issues for Negotiation.** Sometimes an attempt to summarize areas of agreement will identify issues not previously identified. It is better to identify them now rather than after negotiations are complete.

**Bargaining on the Issues.** Bargaining includes persuasion, alteration of assumptions and positions, as well as give and take on the issues including price, schedule, technical requirements, contract type, or other terms of the proposed contract. In noncompetitive negotiation, bargaining involves offers and counteroffers to define changes in the contractor or Government positions. Bargaining continues until the two parties reach agreement or one party decides that agreement cannot be achieved.

• **Follow Your Negotiation Plan.** Maintain the initiative throughout discussions by following your negotiation plan.
  - Use your agenda to address the issues.
  - Ask questions. Listen and evaluate the answers for responsiveness, truth, and consistency. Listening will minimize the probability of misunderstanding and show that you have a genuine interest in what the contractor's negotiator is saying.
  - Employ appropriate tactics and countermeasures to achieve win/win results.

• **Begin Bargaining With Issues Related to Contract Requirements.** Begin bargaining by seeking agreement on the contract requirements.
  - When addressing contract requirements, always consider potential effects on contract price. Remember that any contract requirement may significantly affect contract cost and price. Do not get boxed into a high price by “gold plating” contract requirements.
However, you should consider possible trade-offs between technical requirements and contract price until a final agreement. For example, a lower contract price might be possible if you increase the period of time between contract award and required delivery.

**Bargain on Price After Agreement on Technical Issues.** Once you have an agreement on contract requirements, you can proceed with bargaining on contract price.

- Tailor price negotiations to the contract type. When you negotiate a firm fixed-price contract, you can limit your price agreement to total contract price. For other types of contracts, you will need to negotiate more than one contract element to define contract price. For example, when negotiating a fixed-price incentive firm contract, you must agree on target cost, target profit, share-ratio over target, share-ratio under target, and ceiling price.

- Bargain for a fair and reasonable price. That means you should be willing to negotiate up when the proposed price is unreasonably low or negotiate down when the proposed price is unreasonably high. Remember that your pricing objective should be a price that is:
  - Fair to the buyer;
  - Fair to the seller; and
  - Reasonable considering market conditions, available alternatives, price-related factors, and non-price factors.

- When bargaining is based on price analysis comparisons:
  - Share information on the bases that you used to develop your estimate of a fair and reasonable price unless the information is confidential or proprietary; and
  - Remember that you need to persuade the contractor's negotiator that your price is more reasonable than the contractor's.

- When bargaining is based on cost analysis:
  - Begin by examining the contractor's work design and its affect on key elements of cost and profit/fee.
  - Typically, you should address contract costs in the following order:
    - Direct costs (e.g., materials, labor, and other) of performing the work;
    - Indirect costs (e.g., such as overhead and general and administrative expense; and
    - Profit or fee.
  - Do not require agreement on every cost element.
  - Consider available bases for price analysis. Do not get lost in contract cost information. Your goal should always be a price that is fair and reasonable.

*Reaching Agreements on the Issues.* As you bargain, remember you need an agreement that considers all the issues, but you do not have to reach agreement on every issue. For example, you do not have to agree on every issue related to contract cost as long as you can agree on a fair and reasonable contract price.

**Periodically Review Areas of Agreement.** Review areas of agreement before you begin bargaining and periodically throughout negotiations until you have an overall agreement. Periodic reviews tend to reinforce areas of agreement and demonstrate the areas of agreement are more significant than the areas of disagreement.

**Sequence the Areas of Disagreement.** There are several different approaches to sequencing bargaining on areas of disagreement. No one approach is necessarily better than another. The issues being negotiated, circumstances surrounding the negotiation, and the negotiating styles of the negotiator determine the method most likely to succeed. Moreover, predictable patterns may
not even be desirable when regularly negotiating with the same party. Approaches include:

- Negotiating the issues of greatest importance first and then addressing the secondary issues.
- As each issue comes up, try to reach agreement.
- If agreement cannot be reached, lay the issue aside and move on to the next.
- Once you begin discussing issues of secondary importance, you can attempt to trade these secondary issues for the more important unresolved issues.
- Negotiating secondary issues first and then addressing the issues of greatest importance.
- It is often easier to reach agreement on secondary issues and success creates a climate of mutual cooperation.
- The climate of mutual cooperation makes it easier to reach agreement on the more important issues.
- Negotiating the contractor’s demands first.
- This approach carries obvious risks.
  - The contractor may not be motivated by Government concessions. Why concede after your major demands have been addressed?
  - The contractor’s expectations may actually increase. When all the contractor’s demands are met, more may appear.
- Negotiate the Government’s demands first. This is the opposite of the approach above.
- By first reaching agreement on issues important to the Government, you put yourself in a better position to make concessions and foster a win/win environment.
- This approach also carries risks. The most obvious is that the contractor will perceive unreasonable Government demands and refuse to bargain.

**Use Mutual Problem Solving to Reach Agreements.** Your initial approach to resolving issues should be to:

- Work with the contractor's negotiator to identify alternatives. Together, you may be able to identify alternatives that are better than any of the original positions. Brainstorming is often useful for this purpose.
- Consider the acceptability of identified alternatives. Most alternatives will likely be unacceptable to one side or the other. However, there may be several that are acceptable.
- Select the best alternative. Most often, you will be fortunate to find a single alternative that is acceptable to both parties. However, if there are multiple alternatives, select the one that provides the highest mutual satisfaction. For example, the Government wants the technical data available for competitive follow-on acquisitions while the contractor does not want to give competitors access to proprietary information. The seemingly unresolvable problem can often be worked out by contractual language that protects the rights of both parties.

**Use Tradeoffs to Reach Agreements.** Some issues involve differences that do not lend themselves to resolution through problem solving. Each party feels its position is more reasonable based on the available information. When you encounter such issues, consider attempting to reach agreement through tradeoffs.

- When you make a concession, attempt to obtain a concession of at least equal
importance in return. The concession may be on the same issue or a different issue. Remember a concession that is relatively unimportant to you may be very important to the contractor.

- Any offer you make should be supportable and represent a reasonable position. Provide sufficient support to convincingly demonstrate its merits.
- Be prepared to sometimes make concessions that represent real sacrifices in the interest of a win/win outcome.

- **Keep a Written Record of Offers, Counteroffers, Agreements, and Unresolved Issues.** This list can be helpful in defining current positions on resolved and unresolved issues.

- **Reach Agreement.** Do not prolong discussions any longer than necessary. Instead, seize the moment to finalize a good agreement. If the contractor’s negotiator is reluctant:
  - Emphasize the advantages of the proposed agreement;
  - Offer assurances, such as, "This is a good agreement for everyone," or "I am confident that we both have a good deal;" and
  - Focus attention on your intent to finalize an agreement to provide the final push needed for acceptance.

**Closing the Negotiation Conference.** Close the negotiation conference as soon as possible once an agreement is reached.

- Review Key Elements of the Agreement. A review will protect negotiators from finding out later that they actually agreed to different things.
- **Offer a Handshake on the Agreement.** A handshake is a symbolic gesture of mutual agreement.

### 4.2 Recognizing Differences Between Pre- And Post-Award Negotiations

This section will examine unique points to consider when negotiating post-award contract actions:

- **4.2.1 - Recognizing Special Considerations For Equitable Adjustments**
- **4.2.2 - Recognizing Special Considerations For Termination Settlements**

**Different Post-Award Negotiations.** Two types of post-award negotiations will be examined in this section:

- Equitable adjustment under one of several different contract clauses; and
- Settlement under one of the contract termination clauses.

**Negotiation Similarities.** While this section concentrates on negotiation differences, remember that there are more similarities than differences. Whether you are negotiating before or after contract award, you must:

- Strive for win/win results;
- Conduct exchanges with the contractor prior to contract negotiations when necessary to establish the facts and issues related to the negotiation;
- Prepare effectively for the negotiation including development and, if necessary, approval of a negotiation plan; and
- Use the negotiation plan and your negotiation skills to obtain a mutually satisfactory result.

### 4.2.1 Recognizing Special Considerations For Equitable Adjustments

**Clauses Providing for Equitable Adjustment (FAR 52.236-2, FAR 52.242-14, FAR 52.242-15, FAR 52.242-17, FAR 52.243, FAR 52.245-1).**

You may need to negotiate an equitable adjustment under one of several different contract clauses that provide for an equitable adjustment in certain situations. These include the:
Changes clause;
Government Property clause;
Suspension of Work clause;
Government Delay of Work clause;
Stop-Work Order clause; or
Differing Site Conditions clause.

Unilateral and Bilateral Modifications (FAR 43.103, FAR 52.212-4(c), and FAR 52.243-1).
There are two basic types of contract modifications permitted under the contract Changes clause:

- **Bilateral modifications** are signed by both the contractor and the contracting officer. You can use them to:
  - Define all aspects of the contract modification, including an equitable adjustment, at the time that the modification is made;
  - Incorporate a negotiated equitable adjustment that resulted from a unilateral contract change, or;
  - Definitize a letter contract.

- **Unilateral modifications** are signed only by the contracting officer and do not require contractor consent.
  - Unilateral modifications are not permitted under the standard FAR Contract Terms and Conditions -- Commercial Items clause. However, the clause may be tailored to provide for unilateral contract modification.
  - Unilateral modifications are permitted under the Changes clauses for all noncommercial contracts.
  - You can use a unilateral contract modification to direct the contractor to modify any of the contract elements specified in the relevant contract Changes clause.
  - The contractor is required to continue performance of the contract as changed and can request an equitable adjustment within the period prescribed in the clause.

Preference for Bilateral Modifications (FAR 43.204(b)). When time permits, the contracting officer should generally modify contract requirements using a bilateral contract modification for three reasons:

- Only one contract document is required.
  - If you make a bilateral contract modification, you can use a single document to modify the contract requirements and incorporate any necessary equitable adjustment.
  - If you make a unilateral contract modification, you must use one document to make the contract modification and a second document to incorporate any necessary equitable adjustment.

- The equitable adjustment is established before work begins. When you use a unilateral contract modification, the contractor must continue to perform the modified contract.
  - While continuing to perform, the contractor incurs actual costs related to the change. As a result the contractor's proposal for an equitable adjustment must include a combination of actual and estimated costs. Each day work is completed so actual costs change and the estimated cost for uncompleted work changes. Negotiations are like trying to hit a constantly moving target.
  - Each day of contractor performance reduces the possibility that you can further influence how the contractor will interpret the modified contract requirements.

- Contracting officers must definitize unilateral modifications within the shortest practicable time.
Contracting officers commonly perceive this requirement as additional pressure for timely settlement on them but not on the contractor.

Other Reasons for Equitable Adjustments. An equitable adjustment may also be necessary when:
- Either the Government or the contractor fails to meet its contract obligations. (e.g., the Government fails to deliver Government furnished property when and where required); or
- There is a change in the contracting situation (e.g., a differing site condition on a construction contract).

Equitable Adjustment Objective. As the term implies, your objective should be an "equitable" adjustment. FAR does not define the term "equitable." Instead the Government relies on the judgment of the contracting officer and precedents established by the Courts and Boards of Contract Appeals. In general, an equitable adjustment is one that is fair to all concerned. Many define it as leaving the contracting parties in a position no better or worse than before the action or inaction that necessitated the adjustment.

Equitable Adjustment Elements. An equitable price adjustment should consider changes in contract price and other terms affected (e.g., schedule).
- Price changes should consider the reasonable cost of completing the contract before the act that necessitated the adjustment and the reasonable cost of performing the contract after it.
- Contract terms (e.g., schedule) should consider the effect of the act on contract performance. For example, production must stop because parts that meet new requirements will not be available at any price for six months, but parts that met the original requirements were in stock.
- Elements of the adjustment can be traded off. For example, when contract requirements increase, the contractor might request a higher price to make the change and meet the required delivery schedule. However, the contractor might accept a lower price increase if you extend the delivery schedule.

Special Problems in Equitable Adjustment Negotiation. An equitable adjustment negotiation often presents special negotiation problems. The biggest problems are usually related to adjusting contract price. As stated above, the objective is a fair adjustment that leaves the contracting parties in a position no better or worse than before the action or inaction that necessitated the adjustment.

The preferred method of pricing the adjustment is by negotiating the difference between the reasonable cost of performing the contract before the action or inaction that necessitated the adjustment and the reasonable cost after. Depending on the type of equitable adjustment profit may or may not also be adjusted.

The main problem is deciding what costs are reasonable:
- The same rules on cost allowability that apply to new contract negotiations also apply to equitable adjustments. Unfortunately, many contractors not familiar with cost negotiations often do not understand that they cannot recoup such unallowable costs as interest expense.
- You may have to rely on the opinions of experts concerning actual costs incurred by the contractor. This is particularly likely when the contractor does not have an adequate cost accounting system.
- You may have to rely on the opinions of experts concerning work actually completed. This is particularly likely when the contractor does not have a well documented system for managing contract performance. This is a special problem if the contractor overestimates the work completed to support an unreasonably low estimate of the cost of work deleted and not performed.
- Most contractors are very reluctant to accept estimates showing that the costs for work deleted would have been more than estimated at the time of contract award. Some look at equitable adjustments as an opportunity to recoup losses associated with unrealistically low cost estimates at the time of contract award.

Contractor Advantages in Equitable Adjustment Negotiation. An equitable adjustment negotiation may provide the contractor with negotiation advantages not present before contract award.
- Negotiations are noncompetitive. Pricing alternatives on the original contract may have been
limited by competition.

- Contracting officers have time limits to complete definitization of unilateral contract modifications. Those limits increase pressure on the contracting officer to complete negotiations. However, they do not directly increase pressure on the contractor.

- While performing under a unilateral modification, the contractor is incurring actual costs. The fact that the costs have already been incurred provides strong support for the position that the costs are reasonable.

**Government Advantages in Equitable Adjustment Negotiation (FAR 31.201-3(a)).** An equitable adjustment negotiation may also provide the Government with negotiation advantages that it did not have in the original contract award.

  - The contractor performance must continue, so the Government is not faced with a lack of progress in meeting its needs.
  
  - Payment for affected items delivered may be withheld until unit prices have been adjusted as part of the equitable adjustment, increasing pressure on the contractor to negotiate.
  
  - The contractor is incurring actual costs, but you are precluded from paying any cost that is not reasonable (actual cost or not). Until the adjustment is consummated, the contractor assumes the risk that its actual costs will be accepted as reasonable. As this actual cost increases, so does the pressure to negotiate.
  
  - The clauses that provide for equitable adjustment also provide for a unilateral contracting officer decision if no agreement can be reached. Of course, the contractor can dispute the decision, but the process is expensive and long. Most importantly, there is no guarantee that the dispute will be successful, particularly when the contracting officer's final decision is reasonable.

**Win/Win Benefits of Negotiated Adjustments.** A negotiated agreement is generally a better deal for both sides because:

  - A unilateral contracting officer's decision may give the impression of being win/lose no matter how reasonable it is.
  
  - Disputes are long and expensive for both parties involved.
    
    - If the Government wins, the contracting officer's decision may still appear one-sided to the contractor.
    
    - If the contractor wins, it appears that the Government adopted a win/lose position and lost.

### 4.2.2 Recognizing Special Considerations For Termination Settlements

**Contract Terminations (FAR 49.101).** There are two general types of contract terminations.

- **Termination for Convenience.** The contract termination for convenience clause gives the Government the right to terminate the contract when it is in the Government's best interest to do so. Specific provisions for settlement will depend on the commercial or noncommercial nature of the product and the contract type.

- **Termination for Default or Cause.** The contract termination for default clause or termination for cause clause gives the Government the right to terminate the contract when the contractor fails to meet its obligations under the contract. Specific Government rights depend on the commercial or noncommercial nature of the product and the contract type.

**Termination Settlement Negotiation (FAR 52.212-4, FAR 52.249-1, FAR 52.249-2, FAR 52.249-6, and FAR 52.249-8).**

Noncommercial fixed-price termination for convenience settlements typically require more and more complex negotiations than any other type of termination settlement.

- Commercial contract termination for convenience settlements center on determining the percentage of contract work performed prior to the notice of termination and reasonableness of
charges related to the termination. The termination settlement is calculated by multiplying the contract price by the percentage of work performed and adding the reasonable charges related to the termination.

- Cost-reimbursement contract terminations for convenience require little negotiation because the contractor is entitled to receive all allowable costs and any related fee.
- Settlements for terminations for default or cause normally require little negotiation because the general requirements for settlement are described in the clause. In fact, most negotiations related to terminations for default or cause involve contractor efforts to convince the Government that there are factors that justify converting the termination for default or cause into a termination for convenience.

Noncommercial Fixed-Price Termination for Convenience Settlement Objective (FAR 49.201(a) and FAR 49.201(b)).

For a noncommercial fixed-price contract termination for convenience, your objective should be a settlement that compensates the contractor fairly for the work done and the preparations made for the terminated portions of the contract including a reasonable allowance for profit.

- Fair compensation is a matter of judgment and cannot be measured exactly.
- Various methods may be equally appropriate for arriving at fair compensation.
- The use of business judgment, as distinguished from strict adherence to accounting principles, is the heart of settlement.
- The parties may agree upon a total amount to be paid to the contractor without agreeing on or segregating the particular elements of cost or profit comprising that total.

Noncommercial Fixed-Price Termination for Convenience Guides for Settlement (FAR 49.201 and FAR 49.207).

The primary objective is to negotiate a settlement by agreement.

- Cost and accounting information provide guides for negotiating a fair settlement, but they are not a rigid measure.
  - In appropriate cases, costs may be estimated, differences compromised, and doubtful questions settled by agreement.
  - Other types of data, criteria, or standards may furnish equally reliable guides for fair compensation.
- The amount payable under a settlement (not including settlement costs) must not exceed the contract price less payments otherwise made under the contract. From that amount you must deduct any disposal or other credits.

Special Problems in Fixed-Price Terminations for Convenience Settlement Negotiation. A fixed-price contract termination for convenience settlement negotiation may also present special problems.

- The biggest problem is often the atmosphere surrounding the termination process. While the atmosphere surrounding a new contract negotiation is one of hope and a new beginning, the atmosphere surrounding a termination is one of lost opportunities. Many times it is an atmosphere of distrust and resentment. You must not allow this atmosphere to drag you into a win/lose negotiation.
- Contractors are required to submit final settlement proposals within one year of the contract termination but the period for submission can be extended by the termination contracting officer. The long period of time between the termination and settlement negotiation can affect the availability of information and your ability to verify the facts surrounding the termination. Work in process inventory, special tooling, special test equipment, or important records may be lost during this extended period of time. Costs incurred after the termination may be mixed with costs incurred before the termination.
- The same rules on cost allowability that apply to new contract negotiations and equitable
adjustments also apply to termination settlements. Unfortunately, many contractors not familiar with cost negotiations often do not understand that they cannot recoup unallowable costs.

- You may have to rely on the opinions of experts concerning actual costs incurred by the contractor. This is particularly likely when the contractor does not have an adequate cost accounting system.
- In a partial termination settlement, the contractor may propose increased costs in the continued portion of the contract related to the termination. Never consider these costs as part of the termination settlement. However, you may consider the need for a separate equitable adjustment.

**Contractor Advantages in Fixed-Price Termination for Convenience Settlement Negotiation.** A fixed-price contract termination for convenience settlement negotiation may provide the contractor with negotiation advantages not present before contract award.

- Negotiations are noncompetitive. Pricing alternatives on the original contract may have been limited by competition.
- When the contractor's accounting system permits cost identification and tracking, actual costs should be available. There should be few cost estimates.

**Government Advantages in Fixed-Price Termination for Convenience Settlement Negotiation (FAR 52.249-2(g)).**

A fixed-price contract termination for convenience settlement negotiation may also provide the Government with negotiation advantages that it does not have in the original contract award.

- Normally, the Government will owe the contractor additional funds when the settlement is reached. This should increase the contractor's desire to reach an agreement.
- The fixed-price termination for convenience clause permits the contracting officer to unilaterally settle the termination by paying the amounts determined reasonable. Of course, the contractor can dispute the determination, but the process is expensive and long. Most importantly, there is no guarantee that the dispute will be successful, particularly when the contracting officer's determination is reasonable.

**Win/Win Benefits of Negotiated Settlements.** A negotiated agreement is generally a better deal for both sides.

- A unilateral contracting officer settlement determination gives the impression of being win/lose no matter how reasonable it is.
- Disputes are long and expensive for both parties involved.
  - If the Government wins, the contracting officer's determination may still appear one-sided to the contractor.
  - If the contractor wins, it appears that the Government adopted a win/lose position and lost.

#### 4.3 Identifying Documentation Requirements

**Need for Documentation.** Documentation must identify the significant facts and issues that affected the negotiated contract price. As a minimum, it should include:

- The proposal and any related information submitted by the contractor;
- The Price Negotiation Memorandum (PNM);
- Copies or references to the location of any technical or audit analysis reports considered during the negotiation; and
- A record of any request for additional contractor information to support the proposal and the contractor's response.

**Price Negotiation Memorandum (FAR 15.406-3).** At the close of each negotiation, you must promptly prepare a PNM outlining the principle elements of the contract negotiation and include a copy in the contract file. Formats vary, but the PNM must include the following information:
- Purpose of the negotiation (new contract, final pricing, etc.)
- Description of the acquisition, including appropriate identifying numbers (e.g., RFP number).
- Name, position, and organization of each person representing the contractor and the Government in negotiations.
- The current status of any contractor systems (e.g., purchasing, estimating, accounting, or compensation) to the extent that they affected and were considered in the negotiation.
- If the offeror was not required to submit cost or pricing data to support any price negotiation over the cost or pricing data threshold, the exception used (e.g. acquisition of a commercial item) and the basis for using it.
- If the offeror was required to submit cost or pricing data, the extent to which the contracting officer:
  - Relied on the cost or pricing data submitted and used in negotiating price;
  - Recognized any cost or pricing data submitted as inaccurate, incomplete, or noncurrent:
  - The action taken by the contracting officer as a result of that recognition;
  - The action taken by the contractor as a result of that recognition; and
  - The effect of the defective data on the price negotiated; or
  - Determined that an exception applied after the data were submitted and, therefore, did not consider the submission to be cost or pricing data.
- A summary of the contractor's proposal, any field pricing assistance recommendations, including the reasons for any pertinent variances from them, the Government's negotiation objective, and the negotiated position.
  - When the determination of price reasonableness is based on cost analysis, the summary must address each major cost element.
  - When determination of price reasonableness is based on price analysis, the summary must include the source and type of data used to support the determination.
- The most significant facts or considerations controlling the establishment of the prenegotiation objectives and the negotiated agreement including an explanation of any significant differences between the two positions.
- To the extent such direction has a significant effect on the action, a discussion and quantification of the impact of direction given by Congress, other agencies, and higher-level officials (i.e., officials who would not normally exercise authority during the award and review process for the instant contract action).
- The basis for the profit/fee prenegotiation objective and the profit/fee negotiated.
- Documentation that the negotiated price is fair and reasonable.

**PNM Cost Element Summary.** When you use cost analysis, your cost element summary should address the offeror's estimating rationale, the Government's objective, and the amount considered negotiated. Commonly, this summary begins with a tabular presentation similar to the following:

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Proposed</th>
<th>Objective</th>
<th>Considered Negotiated</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Direct Labor</td>
<td>$1,000,000</td>
<td>$900,000</td>
<td>$925,000</td>
<td>See Para A</td>
</tr>
<tr>
<td>Engineering</td>
<td>$2,500,000</td>
<td>$2,025,000</td>
<td>$2,127,500</td>
<td>See Para B</td>
</tr>
</tbody>
</table>
Using this type of tabular cost element summary, you can identify the areas and degree of differences and provide a general format more detailed analysis.

- In Paragraph A, summarize:
  - The rationale used by the offeror in developing the proposal.
  - Any technical or audit recommendations. Focus on any differences between the proposal and the recommendations.
  - The reasons for any differences between technical or audit recommendations and the Government objective.
  - The reasons for any differences between the Government objective and the amount considered negotiated. (Note: You and the contractor will likely not agree on each element of cost so the amount considered negotiated is your analysis of the cost used to arrive at a reasonable price.)

- In Paragraphs B and C, address the same subjects covered in Paragraph A with one major addition. Since dollars are calculated using overhead and G&A rates, you need to address whether the dollar differences are the result of differences in the application base, the rates themselves, or both.

<table>
<thead>
<tr>
<th>PNM Cost Element Summary (cont)</th>
<th>In the example above, the differences in engineering overhead dollars result from differences in both the base and the rate.</th>
<th>Engineering Overhead</th>
<th>Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed</td>
<td>$1,000,000 x 250% = $2,500,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>$900,000 x 225% = $2,025,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Considered Negotiated</td>
<td>$925,000 x 230% = $2,127,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- The differences in G&A expense dollars relate only to differences in the base. The rate is the same for all three positions.

<table>
<thead>
<tr>
<th>G&amp;A Expense</th>
<th>Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed</td>
<td>$3,500,000 x 10% = $350,000</td>
</tr>
<tr>
<td>Objective</td>
<td>$2,925,000 x 10% = $292,500</td>
</tr>
<tr>
<td>Considered Negotiated</td>
<td>$3,052,500 x 10% = $305,250</td>
</tr>
</tbody>
</table>
When you use price analysis, your price summary should address each unit price, the Government's objective, and the price negotiated. Commonly, this summary begins with a tabular presentation similar to the following:

<table>
<thead>
<tr>
<th>Item</th>
<th>Proposed</th>
<th>Objective</th>
<th>Negotiated</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>$15,000</td>
<td>$14,000</td>
<td>$14,250</td>
<td>See Para A</td>
</tr>
<tr>
<td>0002</td>
<td>$10,000</td>
<td>$9,750</td>
<td>$9,750</td>
<td>See Para B</td>
</tr>
<tr>
<td>0003</td>
<td>$4,500</td>
<td>$4,400</td>
<td>$4,500</td>
<td>See Para C</td>
</tr>
</tbody>
</table>

- If the same rationale applies to all items, a single explanatory paragraph should be enough.
- If different rationales apply to different items, you may need to provide several explanatory paragraphs.

**PNM Analysis of Facts or Considerations Affecting Price.** As you document the significant facts or considerations affecting the proposal, your objective, and the amount negotiated, consider the effect of the following:

- Items or services being purchased;
- Quantities being purchased;
- Place of contract performance;
- Delivery schedule or period of performance;
- Any difference(s) between the proposed delivery schedule, the objective schedule, and the negotiated schedule;
- Any previous buys of similar products including:
  - When,
  - How many,
  - Schedule/production rate,
  - Contract type, and
  - Unit prices or total prices, including both target and final prices, if applicable;
- Any Government-furnished material that will be provided as a result of the contract; and
- Any unique aspects of the contract action.

**PNM Distribution (FAR 15.406-3(b)).** Whenever you obtain field pricing assistance to support your negotiation, you must forward a copy of the PNM to the office(s) providing field pricing assistance. When appropriate, you should also forward recommendations on how field pricing assistance can be made more effective.

**Technical and Audit Reports.** Technical and audit reports provide key insights into the rationale that you used in developing your prenegotiation objectives. Normally, you should include a copy of each relevant report in the contract file. However, if the report is large or only available electronically, it may not be practical to include a copy in the contract file. In such situations, you must at least include information on
where the full report can be found.

Record of Any Additional Information. The contract file should also include a record of any request(s) that you submitted to the contractor for additional information along with the contractor's response.

- 5.0 - Introduction
- 5.1 - Recognizing Different Forms Of Nonverbal Communication
- 5.2 - Describing How Body Language Affects Negotiations
- 5.3 - Describing How The Physical Environment Affects Negotiations
- 5.4 - Recognizing How Personal Attributes Affect Negotiations

https://acc.dau.mil/CommunityBrowser.aspx?id=379620 - 5.4

5.0 Introduction

Communication Is More Than Verbal. Good negotiators must first be good communicators. Unfortunately, many negotiators think of communication only as oral or written verbal exchanges. But verbal exchanges account for only a fraction of the messages people send and receive. Research has shown that between 70 and 90 percent of the entire communication spectrum is nonverbal. Consequently, you should be aware of the different forms of nonverbal communication that you are likely to encounter during negotiation conferences.

Although we continually send and receive nonverbal messages, most of us are not fully aware of the ways that we communicate nonverbally. Still, if you watch carefully, you will see that most leading professionals (e.g., doctors, lawyers, politicians, corporate chief executive officers, and contract negotiators) are excellent nonverbal communicators. Some people call it charisma. Others call it style. Whatever it is, they have it!

5.1 Recognizing Different Forms Of Nonverbal Communication

Importance of Nonverbal Communication. If you are only aware of a negotiator’s verbal message, you will likely miss the major portion of the overall communication. Being aware of both nonverbal and verbal messages will give you an important edge.

- Skills in interpreting nonverbal communications will help you glean useful information from others involved in the negotiation.
- An awareness of nonverbal communication may also prevent you from harming your own negotiation position by inadvertently sending nonverbal signals that disclose confidential information or weaknesses in your position.

Areas of Nonverbal Communication. Nonverbal communications include all forms of communication that are not part of the language that we speak or write. There are many ways that we reveal ourselves nonverbally. This text will concentrate on the three areas of nonverbal communication that will most likely affect contract negotiations:
- Body language (kinesic communication) using facial expressions, body movements, gestures, and posture;
- Physical environment (proxemic communication) using available space, distance from or proximity to other people, and territorial control; and
- Personal attributes such as:
  - Physical appearance (artifactual communication) including all options that communicators use to modify their appearance;
  - Vocal cues (auditory communication); and
  - Touch (tactile communication) particularly the handshake.

Conscious or Subliminal Messages. Nonverbal communications can involve conscious or subliminal messages.

- Conscious nonverbal communications.
Senders of conscious nonverbal communications are aware that they are sending a message and the general meaning of that message. For example, the individuals extending a hug know that they are embracing someone and that action is normally perceived as indicating affection.

Receivers of conscious nonverbal communication are aware that they received the message and the meaning intended by the sender. The receiver of a hug, for example, generally realizes that the message is a sign of friendship.

**Subliminal nonverbal communications.** Subliminal messages are communicated to the subconscious mind of the receiver. Receivers of subliminal messages are not consciously aware of the message. However, these messages are important.

- Gut reactions are frequently based upon your subconscious reading of subliminal nonverbal communications.
- Police and military uniforms subliminally communicate the authority of those wearing them.
- Well-dressed executives project success and credibility.
- Poor dress transmits messages of failure and a lack of credibility.
- Although subliminal messages do not create awareness on a conscious level, they still influence the receiver. In fact, subliminal messages are often more powerful than conscious messages. The advertising world is replete with examples of the value of subliminal nonverbal messages.
- Young, beautiful people are often seen in advertisements to communicate the subconscious message that the advertised product is associated with youth and beauty.
- Companies pay large sums of money to have their products appear in movies. While these appearances are not typical product advertisements, the mere association of the product with the movie transmits subliminal messages that will influence viewers.

Voluntary or Involuntary Messages. Conscious and subliminal messages can both be transmitted voluntarily or involuntarily.

- **Involuntary nonverbal communications.** Most nonverbal messages are involuntarily. In fact, many negotiators are not aware that they communicate nonverbally.
  - Body language is one area where the involuntary nature of nonverbal communication is particularly evident. Every day, people unintentionally convey nonverbal signals by their facial expressions, gestures, and body postures. For example, people telling falsehoods often involuntarily send a telltale nonverbal message to listeners by frequently blinking their eyes.
  - Because involuntary nonverbal communications represent unplanned physical responses, this communication form tends to be particularly revealing and more honest than verbal communication or even conscious nonverbal communication.

- **Voluntary nonverbal communications.** Nonverbal communication can also be controlled by a knowledgeable person.
  - A person who knows that people telling falsehoods often blink their eyes can take special care not to blink when telling a falsehood.
  - A person who knows that a hug indicates friendship can consciously hug his/her worst enemy as trick to put the person off guard or as part of an effort to improve their relationship.

Interpreting Nonverbal Messages. You must interpret nonverbal messages as part of the overall communication system.

- Typically, an individual nonverbal message is difficult to accurately interpret in isolation because
most messages have several possible meanings. For example:

- A yawn might indicate a lack of interest, physical fatigue, or both.
- Rapid eye blinking might indicate deceit or just poor fitting contact lenses.

- A nonverbal message is easiest to interpret when it is consistent with other communications that you are receiving at the same time. For example, you might be more likely to interpret rapid eye blinking as indicative of dishonesty if the person also avoids eye contact while speaking.

- An inconsistent nonverbal message may be impossible to interpret. However, an apparently negative nonverbal message should raise a red flag indicating that you should look more carefully for related verbal or nonverbal clues. Look for messages that correlate with each other so that you can make a more accurate interpretation.

**Cultural Differences.** Always consider cultural differences when you send or receive nonverbal messages. A message that has a particular meaning in one society can have a completely different meaning in another society. For example, in the United States we encourage eye contact as an indicator of honesty and interest. People in some other societies believe that they should look down when talking to another person to indicate deference and respect. For them, direct eye contact might be considered offensive and disrespectful.

### 5.2 Describing How Body Language Affects Negotiations

**Body Language and Attitudes.** Body language research has catalogued 135 distinct gestures and expressions of the face, head, and body. Eighty of these expressions were face and head gestures, including nine different ways of smiling. These gestures and expressions provide insight into the attitude of the originator. Simultaneous physical signals often reinforce each other and reduce the ambiguity surrounding the message. For example, eagerness is often exhibited with the simultaneous physical displays of excessive smiling along with frequent nodding of the head.

Common attitudes communicated nonverbally during negotiations can be grouped into two broad classifications -- positive attitudes and negative attitudes.

**Example of Positive and Negative Attitudes.**

Which team shows a win/win attitude?

The illustration above depicts the body language demonstrated by two negotiation teams. The nonverbal messages provided by their body postures, facial gestures, and appearance provide substantial information about both teams. Note that the team on the:

- Right transmits nonverbal messages exuding confidence and success.
- Left transmits nonverbal messages that convey negative attitudes and other unflattering characteristics.

**Positive Attitudes.** Positive attitudes indicated by body language may signal a sincere effort to achieve win/win results. Key indicators of positive attitudes are listed below.

- Speakers indicate respect and honesty by keeping their eyes focused on the eyes of the listener(s).
- Confidence is often exhibited by:
- Hands in pockets with thumbs out;
- Hands on lapel of coat;
- Steepled fingers or hands;
- Good body posture (e.g., square shoulders and a straight back); or
- Hands on hips.

**Interest** may be exhibited by one or more of the following:
- Tilted head toward speaker;
- Sitting on edge of chair;
- Upper body leaning in sprinter’s position; or
- Eyes focused on speaker.

**Careful evaluation** of what is being said is frequently indicated by one or more of the following:
- Peering out over eyeglasses;
- Chin cupped between thumb and fingers;
- Putting hands to bridge of nose; or
- Stroking chin.

**Eagerness** is often demonstrated by:
- Rubbing hands together;
- Smiling excessively; or
- Frequent nodding of the head.

*Negative Attitudes.* Negative attitudes indicated by body language may signal a deceitful nature or a win/lose approach to negotiation. Common indicators of negative attitudes are listed below.

- **Deception or dishonesty** is often demonstrated by:
  - Frequent eye blinking;
  - Hand covering mouth while speaking;
  - Frequent coughing;
  - Looking away while speaking; or
  - Quick sideways glances.

- **Defensiveness** may be indicated by the following:
  - Arms crossed high on chest;
  - Crossed legs; or
  - Pointing an index finger at another person.

- **Insecurity** is often exhibited by:
  - Hands completely in pocket;
  - Constant fidgeting;
  - Chewing on a pencil;
  - Frequent coughing;
  - Biting fingernails; or
Hand wringing.

- Frustration is frequently shown by:
  - Tightness of a person's jaw;
  - Rubbing back of neck; or
  - Drawing eyebrows together.

- Listener boredom or indifference is generally indicated by:
  - Eyes not focused at speaker or looking elsewhere;
  - Head in hand;
  - Sloppy or informal body posture; or
  - Preoccupation with something else.

**Gestures.** Be particularly careful when interpreting or using gestures. A gesture that means one thing in one society can mean something completely different in another. There is a good chance that you will encounter differing interpretations whenever you are negotiating with someone from another part of the world. Even if the other party is from the United States, some of these differing interpretations may remain as part of the person's heritage.

- Shaking your head up-and-down means "yes" in the United States and left-to-right means "no." In some parts of the world, the meanings are just the opposite.

- The hand signal for O.K. in the United States is an obscene gesture in some societies.

- The thumbs-up gesture is a positive sign in most of the world, but in some cultures it is considered a rude gesture.

- The V-shaped hand gesture with the index finger and middle finger may mean victory or peace in the United States, but in some countries it could be interpreted as an obscene gesture.

**Body Language Application.** In contract negotiation, you can use a knowledge of body language in several ways:

- As you prepare for the negotiation conference, you should briefly review key elements of body language with members of the Government team.
  - Exhibiting positive attitudes will make them more believable as they present support for the Government position.
  - Exhibiting negative attitudes will bring their support into question and may raise questions about the entire Government position.
  - A questioning look by a team member as you make a statement may bring your credibility into question.
  - A lack of interest exhibited by a team member may convince the contractor's negotiator that the issue being addressed is not important to the Government.

- During the negotiation conference, you can use your knowledge of body language in several ways. You can:
  - Gain greater insight into the attitude of the contractor's negotiator.
  - Do not take one element of body language and make grand assumptions. Remember that:
    - Similar types of body language can have substantially different meanings.
    - Body language can be controlled by a knowledgeable negotiator.
  - Look for confirming communications either verbal or nonverbal.
Concentrate on using body language that supports your verbal communications (e.g., eye contact will support your truthfulness).

Unless you are very good, you will not be able to completely suppress your natural body language.

However, unless your natural body language indicates a negative attitude, your use of positive body language should strongly support your position.

Consider body language as you listen to the positions taken by other Government team members.

If they appear uncertain, you might interject support.

If they appear negative, you might ask for a brief caucus to remind them of the importance of positive body language.

5.3 Describing How The Physical Environment Affects Negotiations

*Physical Environment.* The physical environment transmits nonverbal messages that can be extremely important to negotiators. Key elements of the environment include:

- The negotiation conference facility;
- Conference table configuration, size, and seating arrangements;
- Physical distance between negotiators;
- Relative elevation of the negotiators; and
- Visual aids.

*Negotiation Conference Facility.* Your negotiation conference facility says volumes about you, your organization, and the importance of the negotiation.

- Messages are sent by the entire facility not just the conference room. A dirty or substandard rest room might actually send a stronger message about your organization than a substandard conference room.
- Negotiators will react to subliminal messages related to the negotiation facility even though they may not realize that the messages exist.
  - Superior negotiation facilities convey positive messages about the host and the importance of the negotiation. These messages may increase the self-assurance of the host and lower the confidence of the guest negotiators.
  - Substandard negotiation facilities convey unflattering nonverbal messages. These unflattering messages may lower the confidence of the host team while increasing the self-assurance of the guest negotiators.
- Negotiators' reactions may be affected by plush carpet or expensive furniture but they are affected more by physical comfort.
  - An older or less attractive Government facility may provide positive results as long as it offers sufficient comfort for everyone involved. That includes:
    - Adequate furnishings, lighting, and space for everyone involved; and
    - A comfortable room temperature.
  - Physical discomfort will likely negatively affect the attitudes of people already under pressure. It may particularly affect the attitude of the guest team, if they perceive the discomfort as a win/lose tactic by the host.

*Negotiation Table Configuration.* Although there is no standard table configuration for every negotiation conference, the table arrangement transmits important conscious and subliminal messages. Those messages are so important that the negotiations to end the Vietnam War were delayed for almost a year.
while the parties involved negotiated the shape of the negotiation table.

- The best table arrangement for any negotiation depends on the situation. However, win/win negotiation attitudes can be promoted with table configurations that convey trust. In contrast, win/lose attitudes are created by table settings that communicate disparity or mistrust between the two parties.

Each negotiation table configuration below conveys a different message.

- **Arrangement A** is a typical configuration for contract negotiations. The two parties sit together to indicate and foster unity. Each team is on a different side of the table and the teams are facing each other so each team member can clearly hear what anyone on the other team has to say.

- **Arrangement B** may tend to give one party an advantage over the other because the arrangement suggests only one important person, the person at the end of the vertical extension.

- **Arrangement C** shows a need for space between the two parities. That space could mean more formality or less trust.

- **Arrangement D** may be the most conducive to win/win negotiations because the round shape is usually associated with equality.

**Negotiation Table Size.** The conference table(s) should be large enough to comfortably seat participants from both teams with adequate space for their work papers, reference material, and briefcases. Depending upon the complexity of and probable length of the negotiation, more chairs may be needed if specialists or observers are added to the group. However, any additional furniture should be positioned so as not to interfere with the action at the negotiation table.

**Principal Negotiator’s Position at the Negotiation Table.** The physical position of the principal negotiator is generally at the center of the negotiation team. The ideal place for the principal negotiator in each arrangement shown above is the middle seat flanked by team members.

- The central position conveys a message of authority and sends an image of a unified negotiation team. For example, the President of the United States always sits at the center of the conference table during Cabinet meetings.

- Besides sending a negative nonverbal message, positioning the principal negotiator somewhere other than at the center of the team also has other consequences. In particular, an end position will likely make it more difficult for some team members to whisper advice, give cues, or pass notes to the principal negotiator.

**Physical Distance Between Negotiators.** People in different cultures require different amounts of physical
distance for communication. Too little or too much space between people can have a negative effect. In the United States, most people:

- Reserve the space closer than 1.5 feet for intimate communication. A negotiator may be annoyed and nervous if you attempt to conduct any significant communication from any distance closer than 1.5 feet.
- Allow a distance of 1.5 to 4.0 feet for close interpersonal contact. A negotiator will likely become increasingly annoyed and nervous as you move closer.
- Allow a distance of 4.0 to 12.0 feet for most business transactions or consultations. Note that four feet is about the distance across the typical conference table.
- Communicate only briefly or formally at a distance beyond 12.0 feet.

**Relative Elevation of the Negotiators.** The phrase "I look up to ..." indicates respect. You need to be aware that this phrase is more than just a cliché. In fact, most people in the United States are conditioned early in life to defer to people on a higher physical level and that training continues throughout their lives. Teachers stand while students sit. Judges preside from raised platforms. Political leaders address supporters from raised stages. Some negotiators attempt to take advantage of this conditioning by raising themselves above the other negotiator. Some make key points while standing or walking around as the other negotiator sits. Others have gone so far as to raise the chairs for their team to a level higher than those for the other team. Do not allow another negotiator to intimidate you by physically talking down to you. If necessary, stand yourself or ask the other negotiator to sit down.

**Visual Aids.** Assure that adequate visual aids are available to support both negotiating teams. Marker boards and chalkboards are practically a standard requirement. Visual aids may also include overhead projectors or videocassette recorders with televisions. Marker boards and chalkboards are excellent for summarizing the negotiation agenda, issues, and agreements. However, you need to remember that the person who is writing on the board has the power of the marker. By controlling what is written, that person can modify the agenda, define key issues, or draft agreements. That power can substantially affect negotiation progress and results.

### 5.4 Recognizing How Personal Attributes Affect Negotiations

**Personal Physical Appearance.** You need be aware of the effect that your physical appearance may have on nonverbal communication. Awareness may permit you to build on your natural advantages. However, awareness of any natural disadvantage may be even more important.

Research has found that:

- **Physical attractiveness affects the way you perceive yourself and the way other perceive you.**
  - Attractive people:
    - Are better liked, get better jobs, and have more self-esteem and social power than unattractive people.
    - Receive preferential treatment in the initiation and development of interpersonal relationships.
- **Height affects perceptions:**
  - Taller men and women are normally perceived as more dominant than shorter men and women.
  - Tall females are perceived as even more dominant and smarter when they are with short males.
- **Body type affects perceptions**
  - Athletic looking people are normally perceived as more assertive and self-reliant than people with other body types.
  - Heavier less athletic looking people are normally perceived as more lazy, sympathetic, and dependent than people with other body types.
Skinny fragile looking people are normally perceived as more suspicious, nervous, and pessimistic than people with other body types.

**Personal Dress.** The importance of how we dress is highlighted by the cliché, "Dress for success." Clothing has been found to affect perceptions of credibility, likability, attractiveness, and dominance, but researchers agree that clothing has the most potent affect on credibility. Unfortunately, many otherwise good negotiators ignore the importance of personal dress during negotiations, and that ignorance negatively affects their ability to attain mutually satisfactory negotiation results.

- Make sure that your clothing is appropriate for the negotiation situation.
  - Normally, you should dress for negotiations as you would for a promotion or job interview. This type of dress emphasizes your credibility and professionalism.
  - Casual days are growing in popularity. On such days, more casual dress may be appropriate. If you adopt more casual dress, always:
    - Advise the contractor of your intent to adopt a more casual atmosphere.
    - Remember that more casual dress will reduce the nonverbal emphasis on your credibility and professionalism.
    - Clothing such as jeans is never appropriate unless you are negotiating on a construction site or similar area.
- If you wear a uniform, wear it properly.
  - In general, people in uniform are perceived to have more power than the same people out of uniform.
  - Failing to wear a uniform properly may be perceived as showing disrespect for yourself, your organization, and the other negotiator.

**General Personal Grooming.** General grooming, especially poor grooming, can have a profound affect on how you are perceived by others. Do not allow poor personal grooming (e.g., uncombed hair or an unshaven look) to detract from your appearance and communicate unfavorable nonverbal messages about you or your negotiation position. Remember, that if you look good, you will generally:

- Feel better;
- Perform better; and
- Be perceived better by others.

**Vocal Cues.** The nonverbal messages communicated by the sound of the human voice, can provide valuable information during negotiations. There are eight attributes of speech that provide especially important vocal cues that you should consider during negotiation:

- **Loudness.** Without enough loudness you cannot be heard. However shouting or a harsh sounding voice may be perceived as disruptive or insulting. Many times, lowering your voice almost to a whisper will help you make a point better than shouting.
- **Pitch.** Most factual communication includes moderate changes in the pitch of your voice. A monotone involves little or no change and may be perceived as indicating apathy or boredom. A high pitched voice may be perceived as indicating excitement. A low pitched voice may be perceived as indicating anger.
- **Rate.** A slow rate of speech may frustrate the listener. An increasing rate may be perceived as the result of increasing intensity. A fast rate may be perceived as an indicator of nervousness and it may also be difficult to understand.
- **Quality.** This is the characteristic that permits you to differentiate one voice from another.
- **Regularity.** The regular or rhythmic voice pattern will normally make you sound more confident or authoritative. Irregular speech might be perceived as more thoughtful or uncertain depending on
your words and other nonverbal messages.

- **Articulation.** Speaking each word clearly makes you easier to understand.
- **Pronunciation.** To be understood, you must also use the correct sounds and emphasis in pronouncing each word. Mispronouncing a word might be perceived as indicator of ignorance or incompetence.
- **Silence.** The absence of sound can also send a strong message. Silence gives you an opportunity to listen. You can obtain useful information from the contractor's team by listening to what they say and how they say it.

**Handshake Cues.** Most negotiations begin and end with a handshake and every time the physical clasp of hands provides subliminal nonverbal message(s) to the parties involved. These messages can have a significant effect on their perceptions or each other.

- **Use your initial handshake to convey a positive first impression.**
  - Signal positive attributes through your grip.
  - A firm handshake or executive grip conveys positive attributes (e.g., power, confidence, and sincerity).
  - A loose handshake may send unflattering messages (e.g., weakness and insecurity). Some people even feel insulted when someone uses a loose grip or just grasps their fingertips.
  - A vice-like grip rarely sends a positive message. It may be perceived as an attempt at intimidation. It may cause real pain. Either way, it is not conducive to initiating a win-win negotiation.
  - Support your grip with other consistent nonverbal messages.
  - Smile and look the other person straight in the eye to signal honesty and friendliness.
  - Slight up and down movement emphasizes the strength of the relationship. However, you should never forcefully shake the other person's hand up and down like an old water pump. That is normally considered excessive. It can also be painful.

- **Use a handshake after agreement to symbolically seal the agreement and set the stage for a positive continuing relationship.**
  - Consider emphasizing the warmth and importance of your continued relationship by:
    - Briefly prolonging the handshake;
    - Grasping the person's hand between both your hands; or
    - Grasping the forearm, elbow, or even the upper arm of the other party as you shake hands.
  - Use a smile and positive words to dispel any tensions that may have built up during negotiations.
  - Failing to offer a handshake could seriously damage any hope for positive continuing relationship.

**Handshake Differences.** Be careful as you interpret handshake cues. As with other nonverbal messages, you should consider the possible effect of cultural differences.

- In some Middle Eastern and Asian cultures, a gentle grip is preferred over the executive grip.
- In some Asian cultures, direct eye contact during the handshake is discouraged.
- In Islamic cultures, men never offer to shake hands with women. Touching between unrelated men and women is forbidden.
- In the United States, some women extend their hand with the palm down preferring to only grasp
fingers rather than use the executive grip. However, most business women prefer the executive grip when shaking hands with men or women, and many are offended when someone only grasps their fingers.

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6.0 Introduction

Ten Rules for Bargaining Success. You do not have to use a particular negotiation style to become a successful negotiator, but your chances of success will improve when you adopt 10 basic bargaining rules followed by win/win negotiators. These rules constitute the most important guidelines on what to do and what not to do in order to attain mutually satisfactory results in Government contract negotiations.

6.1 Rule 1: Be Prepared

Importance of Preparation. Successful negotiators are generally the best prepared negotiators. No amount of negotiator experience, skill, or persuasive ability can fully compensate for the absence of preparation. Moreover, none of the other bargaining rules can be entirely effective without preparation. Adequate preparation by the Government negotiator is essential. When contractors are better prepared than Government negotiators, they have an important bargaining advantage. Although members of the contractor's team may not spend any more time on this contract than the Government, the cumulative preparation time they have spent selling the same product over and over again may give them an edge over individual buyers. Moreover, contractors usually know more about their relatively unique product or service because it is the reason they are in business and, after all, they produce it and may have even invented it.

Negotiator's Perception. Several surveys have shown that many Government contract negotiators do not understand the importance of negotiation preparation. They rate it far down on a list of factors that affect negotiation success. Why would that be true when all the experts say that preparation is essential for negotiation success?

- Perhaps the negotiators surveyed are not aware of the amount of preparation that is really necessary before the negotiation begins. In fact, everything you do from conducting market research to conducting exchanges with the contractor is preparation. It all affects the probability that you will be able to attain a successful outcome in contract negotiation.

- Perhaps they are aware of the importance of preparation, but they do not feel that they have time to prepare well for each negotiation. It could be that they do not have time because they do not prepare well. Poor preparation leads to poor contracts that require constant clarification, modification, and of course more negotiation.

Preparation Dividends. Adequate preparation for most negotiations includes a careful study of the strengths and weaknesses of both positions along with a study of the needs of the other party and the
ways to satisfy those needs. Successful negotiators realize that a relatively small amount of preparation in these areas is well worth the effort. In fact, no other aspect of negotiation continually pays better returns than preparing for the upcoming bargaining session. Conversely, poor preparation adversely affects your chances of success. Side way out of proportion to the time saved. Since there is just no substitute for good preparation, you should never negotiate an issue unless you are adequately prepared.

6.2 Rule 2: Aim High

*Importance of Aiming High.* The slogan "aim high" has a great deal of relevance for successful negotiators because the expectation level of negotiators is closely related to the outcome of the negotiations. Expectations are the gauges by which people measure their performance. Generally, the higher your expectations, the better you will ultimately perform. The reason for this relationship is that expectations influence your behavior and that behavior influences the outcome of the bargaining session.

*Power of Positive Thinking.* The strong correlation between expectations and performance should come as no surprise because it affects many facets of our lives. Norman Vincent Peale focused on the importance of a good attitude in his book, *The Power of Positive Thinking.* In other words, you have a better chance at success if you think you will do well. Conversely, if you think that you will not succeed you will generally do poorly. This theme is constantly demonstrated in everyday life. For example, sports coaches motivate team performance by emphasizing that the team can win if it plays up to its potential. What would happen if instead the coach said, "They are bigger and stronger than you are, so just go out there and try not to get hurt?"

*Laboratory and Classroom Experience.* Laboratory and classroom experience confirms that, under identical circumstances, sellers who expected to receive more for their product (high seller expectation level) generally received a higher price than sellers with lower aspirations. Similarly, buyers who expected to pay a lower price (high buyer expectation level) tended to pay less than their counterparts who faced identical pressures but had lower expectation levels.

*Pressures and Limitations Affect Expectations.* Negotiators, like people in general, are naturally more aware of the pressures and limitations affecting them than they are of the pressures and limitations affecting other negotiators. As a result, buyers are often willing to pay more than necessary, while sellers are often willing to accept less than necessary.

The private sale of an automobile provides a good example of this phenomenon.

- Private party sellers frequently sell their cars for less money than what the vehicles are actually worth because the sellers are *more aware* of their own personal pressures and problems related to the sale. These sellers have no knowledge of the pressures facing the nameless strangers who respond to their newspaper ads.

- Similarly, car buyers are often acutely aware of the personal pressures associated with their car purchase (e.g., their urgent need for transportation) and know little or nothing of the pressures facing the seller.

- The party that best understands these pressures will normally have more success in the negotiation process. This ignorance of the pressure facing the other party explains why the expectation levels of otherwise good negotiators are frequently not as high as they should be.

*Make Positive Assumptions.* The key to establishing high expectations is developing positive assumptions about your bargaining position. Positive assumptions lead to high expectations while negative assumptions lead to low expectations.

The $18,000 blue book value of an automobile is a good illustration of this phenomena.

- Many sellers will assume that $18,000 is the most they could get for the car.

- Sellers with positive assumptions will assume that the blue book price represents an average price which means some cars sold for more than $18,000 and some for less. They expect to be among the sellers to sell at higher than average price. Making this favorable assumption will normally increase their success in negotiations.

*Always Aim for a Win/Win Outcome.* In Government contract negotiations, high expectations should be more than just obtaining contracts at good prices. You should "aim high" by striving for win/win outcomes with high expectations on both price and on non-price (e.g., contract requirements) issues. Aiming high must not conflict with a win/win approach to negotiation. High expectations include good
quality, timely delivery, and a mutually beneficial long term relationship. Moreover, there is typically a range of prices that you could consider fair and reasonable. Having the expectation of negotiating a contract price below your minimum estimate of a reasonable price is not a win/win approach. Aiming to negotiate a price that is not fair and reasonable will likely result in a win/lose or lose/lose outcome.

6.3 Rule 3: Give Yourself Room To Compromise

Importance of Giving Yourself Room to Compromise. Compromise is essential to successfully conducting most negotiations. Even the most skilled bargainers must make concessions in order to obtain successful outcomes. Yet, many negotiators are unable to make material sacrifices because their opening position is too close to their expectation level. Consequently, their inability to compromise often leads to feelings of frustration by both parties which can preclude a mutually satisfactory agreement. You can easily adhere to this rule by establishing an opening position that allows you to compromise and still reach your objective.

When negotiating contract price, Government negotiators should normally present an initial position below what they feel the ultimate price will be in order to be in the position to make concessions before agreeing on the final price. In contrast, contractors should normally ask for more than what they expect so that the other party will be satisfied with a compromise that is still within the Government's range of acceptable outcomes.

Compromise Takes Planning. Whenever you review the proposal and related Government analyses there is a temptation to only develop one position, the Government objective. In developing that objective, you typically consider many compromises from positions taken by one or more Government analysts. If you only present the Government objective to the contractor, the contractor's negotiator will never fully understand the compromises that you have made in arriving at that position. Instead, the contractor's negotiator will think that you are inflexible.

Instead, you need to develop a variety of positions that will permit you to demonstrate a range of apparently fair and reasonable positions. They will also permit you to demonstrate flexibility in making the concessions needed to reach a mutually satisfactory result.

Examples of Compromise Expectation. In some cultures the price of everything is negotiable even the price of food or the price of a taxi ride. In the United States, we assume that the prices of these basic items are fixed, but expect the prices of larger items (e.g., an automobile or home) to be negotiable. We normally expect sellers to start high and negotiate down and buyers to start low and negotiate up. When compromise is expected, you may be penalized for having an opening position too close to your objective. For example, you may have a difficult time negotiating a $170,000 sale price for your home when your initial asking price is $170,000. The reason for this difficulty is straightforward. Americans are culturally conditioned to expect the actual sale price for homes to be less than the asking price. Automobile dealers have long followed this rule by using sticker prices that are higher than the prices they expect to receive for their cars. This practice makes it easier for the salesperson to negotiate a good price for the dealership. But just as important, buying the car at a discount instills satisfaction in the buyer, who feels that a good deal was obtained because the agreed-upon price is below the sticker price.

Penalty for Not Giving Yourself Room to Compromise. Some negotiators feel that the best way to obtain a quick settlement is to make a first counteroffer at or very close to their objective. Then they do not make any further concessions. Actually the effect of such positions may be to extend negotiations and even result in a lose/lose situation. Why?

The contractor's negotiator expects compromise during negotiations. The Government's favorable offer raises the negotiator's expectations. The negotiator may be able to settle immediately based on the Government's offer, but negotiations continue because a better deal for the contractor now appears likely. When the Government fails to offer further compromise, the negotiator's expectations are lowered. As a result, the negotiator often becomes frustrated and even angry. Negotiations may actually last longer and end with little satisfaction on either side from any result obtained.

Caution. Never establish an unreasonable position just to give yourself room to compromise. Such positions are normally counterproductive because they often cause the contractor's negotiator to view you as a win/lose negotiator. Guard against this predicament by supporting your opening position with a valid rationale based on available facts and reasonable judgments. In Government contracting, your opening position should be
your minimum position in the range of fair and reasonable prices.

6.4 Rule 4: Put Pressure On The Contractor

Importance of Putting Pressure on the Contractor. Because of the pressure inherent in every negotiation, success in negotiation stems in large part from the ability of a negotiator to increase pressure the other negotiator while at the same time limiting the pressure on themselves. You can often accomplish this by following some simple procedures which will reduce your stress while increasing the pressure on the other negotiator.

Consider Pressures Facing the Other Party. Bargainers are naturally more aware of their own limitations and less aware of the pressure on others. Fortunately there are several ways you can alleviate this weakness.

- Believe that there are unknown pressures facing the other negotiator. Just believing will alleviate some of the pressure on your position.
- Attempt to identify specific pressure elements as part of your preparation for negotiation.
- Listen and watch during negotiation to identify cues on the pressures affecting the contractor’s negotiator.

Consider Competitive Alternatives. In non-competitive negotiations, just the hint of potential competition might pressure the prospective contractor into being more conciliatory and innovative in meeting the Government needs. For example, you can put a great deal of pressure on the prospective contractor by referring to potential alternatives, such as:

- Canceling and resoliciting;
- Changing in product requirements to encourage competition;
- Changing terms and conditions to encourage competition;
- Investing in new source development; or
- Performing the contract requirement with in-house Government resources.

Resist Artificial Pressures. Do not let artificial pressures, such as the perceived stature or the impressive credentials of the contractor’s negotiator, increase the negotiating pressure on you.

- Nicely furnished offices in prestigious locations along with great sounding job titles should be of no help at negotiations unless you allow yourself to be influenced by these fake pressures. For example, the fact that the contractor’s negotiator is a company vice-president should not be any more stressful than if you were negotiating with any other salesman. In some company’s every salesman is a vice-president, because the perceived stature of this job title often gives them leverage over insecure buyers.
- Do not allow certifications adorning walls or listed on business cards intimidate you into thinking that owning the credentials makes the negotiator an expert on the issues under negotiation.

6.5 Rule 5: Do Not Volunteer Weaknesses

Importance of Not Volunteering Weaknesses. Never volunteer information that would weaken your negotiating position or enhance the bargaining position of the contractor. Although this rule is only common sense, it is often overlooked because most people are candid and forthright by nature.

Be Honest But Be Careful. Honesty and ethical behavior are always paramount in any Government negotiating session. However, you do not have to be dishonest to avoid volunteering weaknesses. There are many ways to respond to questions without telling falsehoods or volunteering information detrimental to your bargaining position.

You can normally adhere to this rule by carefully wording statements or by avoiding a direct response to a direct question. For example, when selling a car the owner is commonly asked, “Why are you selling your car?”, the seller could volunteer a weakness by saying, “My car is a gas guzzler.” Alternatively, a seller not wanting to disclose the poor gas mileage could avoid revealing the weakness and still be honest by saying “I want to get another car” or “I just want to drive something different” or “I just want to sell my car.”
Penalty for Needlessly Disclosing Weaknesses. Examples abound of negotiations where Government personnel needlessly disclosed weaknesses and that disclosure resulted in higher contract prices.

- Without being asked, an Air Force engineer admitted during negotiations that the contractor's proposal of $3.5 million was overly generous because the commanding general wanted the contract and $10 million in funding was available for the work. As a result of this admission, the contracting officer believed the negotiated contract price was thousands of dollars more than necessary.

- A Navy negotiator inadvertently divulged information on the extreme importance of completing a construction contract on time. Because of this admission, the contractor's negotiator correctly concluded that the Government had a short deadline and would not have enough time to solicit other offers from competitive firms. This knowledge significantly weakened the Government bargaining position, resulting in a higher than anticipated contract price.

- An attempt by a contractor's negotiator to invoke pity on his firm by disclosing that the firm was behind on payments to subcontractors backfired when the Government negotiator unfairly took advantage of this weakness. Unfortunately, in response to this disclosure of weakness, the "win/lose" Government negotiator was able to negotiate unreasonably low contractor overhead rates.

6.6 Rule 6: Use Concessions Wisely

Importance of Using Concessions Wisely. Because compromise is a vital part of contract negotiations, most successful negotiators are masters of when and how to make concessions. The concessions that you make, when you make them, and how you make them will all have a significant affect on the outcome of the negotiation.

Concession Amount. Do not appear overly generous or rush to make concessions. Concede slowly and in small amounts. Concessions too large or given too quickly may:

- Unnecessarily raise the expectations of the other negotiator. Instead of bringing the parties closer together, the increased expectations of the other negotiator may result in the two negotiators actually being farther apart.

- Give the other negotiator the impression that the concessions were not that important to you or that you are overly anxious for a settlement. Several small concessions will more clearly demonstrate fairness and reasonableness than one or two large concessions.

- Leave little room for further maneuvering.

- Be more than necessary to achieve a mutually satisfactory result.

Something in Return. Link your concessions with the spirit of compromise.

- Whenever practical, indicate your appreciation for previous concessions and emphasize the need for additional concessions.

- Never make a concession without getting, or at least asking for, a concession in return. For example, end concession statements by saying "provided that" to insure your sacrifice is linked to a concession by the contractor. Linking concessions may:
  - Make your concessions appear more valuable. Negotiators, like most people, generally put a higher value on something that requires a sacrifice on their part.
  - Force contractor concessions that otherwise would not have been made.

Equal-Concession Trap. Negotiators often demand equal concessions, particularly when negotiating contract price. For example, "We are lowering our price by $100,000 and we hope that you can at least match that concession."

There are two major problems with demands for equal concessions.

- Equal concessions are only equal if you are equally far from your objective. The contractor may be $300,000 above your objective and you only $150,000 below it. If you both concede $100,000, you would be left with little room to compromise.
• This demand is a form of bargaining on positions. Once you get away from the issues, it may be impossible to return. Win/lose bargaining may be your only alternative.

Splitting-the-Difference Trap. Splitting the difference is a form of the equal-concession trap. It is most often offered in price negotiations and it often sounds reasonable. However, there is no guarantee that the resulting price will be fair and reasonable. For example, if the contractor's position is unreasonably high and you are close to your objective, splitting the difference will likely result in a price that is not fair and reasonable. Repetitive splitting the difference over relatively small amounts should be avoided. This technique often portrays the user in a win/lose vein as someone more concerned about small amounts than a win/win outcome.

If a contractor's offer to split the difference will not enable you to meet your objective, accept the offer as a new contractor position and continue negotiations from there. Remember that when the contractor's negotiator offered to split the difference, that negotiator, in reality, adopted a new negotiation position. If you refuse to split, the negotiator making the offer normally cannot easily retreat from it.

6.7 Rule 7: Say It Right
Importance of Saying It Right. The time-worn axiom, "It's not what you say but how you say it," aptly applies to the way successful negotiators communicate with other negotiators. The importance of good interpersonal relationships cannot be overemphasized. The reason for this is simple. You are trying to negotiate a mutually satisfactory result. Even the most generous offer may be rejected when the contractor feels slighted or offended.

Key Points to Saying It Right. There are several points that you should consider in your efforts to say it right.

• Sell Yourself and Your Ideas.
  o Show the politeness and cordiality that you would expect from a persuasive salesperson.
  o Think before you speak and try to anticipate possible negative reactions.

• Never Use Provocative Terms. For example, use "resolute" instead of "stubborn" or "incorrect" rather than "stupid."

• Be Polite and Show Respect.
  o Always address the contractor negotiators in a polite and respectful manner. It is particularly important to state disagreements in a tactful and businesslike manner instead of responding in a way that may appear as a personal attack. For example, a response to an unacceptable offer might be "We appreciate your efforts to resolve this issue, but we still have a long way to go," instead of a personal remark such as "That offer is an insult to my intelligence."
  o Using discourteous or disrespectful language only upsets the other negotiator and makes it that much harder to obtain a mutually satisfactory result.

• Negotiate from Strength. Use your strong points - be confident.

• Be Personable, But Businesslike. Learn names and use them. Do not use a person's first name or nickname if you feel that the person might be offended.

• Keep It Simple. Negotiators generally will be less willing to agree when they do not understand.

• Never Personalize Differences. For example, never disagree using personal pronouns. Refer to the "XYZ Corporation position" instead of "your position."

• Emphasize the Need for Cooperation. Both parties need to work together to resolve issues. For example, "We must work together to ...."

• Speak in a Voice That Projects Strength and Confidence.
  o Be careful not to sound insincere, tentative, or overly eager for a settlement.
Do not chance slighting the other negotiator by saying things in a condescending or angry tone of voice.

- **Be Cautious About Expressing Unrelated Opinions.** For example, you might make a seemingly inoffensive statement such as, "The Cubs sure whipped the Reds yesterday." This remark could have a negative effect if the other negotiator is a Reds fan or just doesn't like the Cubs or baseball.

- **Never Make Negative Personal Comments.** Be especially careful not to make negative comments about anyone involved in the negotiation process.
  - Negative comments about personnel on the contractor team will likely anger team members.
  - Negative comments about personnel on your team will make you seem petty and highlight discord within the team.

- **Be Calm And Don’t Lose Your Temper.** Remain calm even when others make comments that provoke you. Continue to be polite even when the other side is rude or provocative.

*Penalty for Not Saying It Right.* Not saying it right can do irrevocable harm to the negotiation process. Making a true but unfavorable remark about another negotiator might set an adversarial tone for the entire negotiation. The offended negotiator might resist every offer, not because of the fairness or logic involved but because of the hurt feelings caused by the remark.

**6.8 Rule 8: Satisfy Non-Price Issues**

*Importance of Satisfying Non-Price Issues.* Most negotiations will not end in agreement unless both the price and non-price issues are satisfied. Yet, many negotiators enter negotiations with an awareness only of price issues facing each side and fail to identify important non-price needs of the contractor. In contrast, successful Government negotiators are able to identify the non-price needs of the other party and develop ways to satisfy those needs.

Never narrow down the objective of negotiations to just price issues. Look for non-price needs and the corresponding ways of satisfying the other party. Non-price needs are often difficult to identify because these issues are not specified by the other party. For example, the negotiation to buy a family-owned company includes more than just bargaining the sales price of the business. Other important non-price issues of the seller should also be addressed, such as the desire to protect the jobs of longtime employees or the retention of the family name on the business.

*Identifying Non-Price Issues.* Common non-price issues that you must consider include:

- Technical requirements;
- Data requirements;
- Contract start;
- Contract type;
- Contract financing;
- Delivery;
- Options; and
- Government furnished property.

**6.9 Rule 9: Use The Power Of Patience**

*Importance of Using the Power of Patience.* The power of patience seems obvious. However, practicing patience is often harder than it sounds because of the pressure inherent in every contract negotiation. The quicker the negotiations conclude, the sooner contract performance begins and this natural pressure is relieved.

Nonetheless, you can use patience to:
• Increase the stress on the contractor's negotiator.
• Display resolve or firmness in your position by demonstrating to the other side that you are not overly anxious for a settlement.
• Dissipate the emotional feelings that surround certain issues by showing a willingness to proceed through negotiations or, when necessary, slow them.

Quite often the extra negotiating time taken by patient negotiators translates into thousands and even millions of dollars in additional concessions. In one case, the Government negotiated a $40 million reduction on a $500 million contract by waiting for 2 days - instead of agreeing on price on the day requested by the Government program office.  

Cultural Barriers. American negotiators are generally more impatient than negotiators from other societies. Patience is even sometimes seen as an undesirable quality by the American culture. In contrast, societies known to value patience as a virtue (e.g., the Japanese and Russians) produce negotiators whose patience enhances their bargaining skill. In fact, the Japanese believe that only a fool would quickly conclude a deal. Most successful negotiators would agree with that assessment.

Penalty for Not Using the Power of Patience. Research has shown that the best deal for both sides takes time. Under a controlled environment where both sets of negotiators had access to the same facts, the quickest negotiation sessions generally tended to have unbalanced or win/lose outcomes in favor of either the buyer or the seller. In contrast, the results of longer negotiation sessions based on the same information tended to be more even. These results demonstrated that achieving balanced outcomes takes longer because both sides need time to explain their positions and develop ways to achieve a mutually satisfactory result.

6.10 Rule 10: Be Willing To Walk Away From Or Back To Negotiations

Importance of Being Able to Walk Away from or Back to Negotiations. Deadlock cannot always be avoided and, in fact, is sometimes necessary when dealing with unfair or unreasonable parties. Even the best negotiators sometimes fail to come to mutual agreement and experience this lose/lose outcome. However, good negotiators are neither afraid to walk away from bad deals nor too proud to return to the negotiation table once they realize a better deal cannot be obtained.

Resolve to Walk Away. You should have the resolve to walk away from what a reasonable person would consider to be a bad deal. Emotions or time constraints should not prevent objective thinking or acting in the best interests of the Government. However, the Government team should objectively decide if a stalemate is in the best interests of the Government. For urgently needed items, it may be better for the Government to be on the losing end of a win/lose agreement instead of the losing end of a lose/lose outcome resulting from a deadlock. Nevertheless, the willingness to deliberately deadlock when a fair deal cannot be obtained is extremely important because this attitude gives you the resolve to credibly apply other bargaining techniques.

Resolve to Come Back. You should also have the resolve to come back to the negotiation table after a deadlock. If you learn that a better deal cannot be obtained in a timely fashion elsewhere, do not let pride get in the way of renewing negotiations. Although it is usually better to let the other party make the first move after deadlock, you cannot be sure that will ultimately happen. But even when you make the first move, the other party will often welcome it because of the severe pressure on both parties caused by the deadlock.

Deadlocks are frequently caused by personality conflicts between the principal negotiators who let egos get in the way of a win/win agreement. Professionalism and a win/win attitude help prevent stalemates caused by personality clashes, but it is sometimes necessary to change principal negotiators in order to get the negotiations back on track.

Walkout Risk. A walkout or even the threat of a walkout may be used to your advantage during the conduct of the negotiation, but not without some risk. The risk is that it may be very difficult to get the negotiation started again and back on track. If your walkout or threat to walkout leads to a concession, it is a successful technique. If the walkout fails, however and your position is weakened because an extreme technique did not work, reconciliation will be difficult. Whenever a negotiation conference has reached a point where you think you should terminate discussion and walk out, consider the impact your walkout will have. When you believe the other side will perceive the walkout as a clear indication they should be more flexible, then the walkout may be appropriate. When the walkout would be perceived as a
win/lose ploy, then do not walk out unless you have first tried everything else. *Stay Professional.* When you believe that a contractor is about to walk out:

- **Attempt to Forestall the Contractor's Action.** You might suggest a break (e.g., hours, days, or even weeks) to give both parties time to think things over and review their positions.

- **Remain Professional.** Use words such as, “We sorry that you have chosen to end negotiations. If you change your mind, we are certainly willing to continue bargaining on the issues.” An angry or frustrated reaction will likely not cause the contractor to reconsider. However, a professional reaction may prevent the impasse make it easier to restart negotiations at a later time.

**Considering Your BATNA (**FAR 15.404-2(d)**).** When a walkout appears eminent, you should always consider your best alternative to negotiated agreement (BATNA). Work with management to evaluate your current position and your alternatives. This evaluation should consider questions such as the following.

- Is the current Government position reasonable based on the available information?

Unless there is a truly urgent requirement, such as a contingency operation, you must be willing to back away from unreasonable agreements. If the Government position is reasonable, you need to consider the remaining questions.

- What is your BATNA?

If you believe that your position is reasonable and the contractor's position is unreasonable, you must ask the question “What happens if we cannot reach a mutually satisfactory result with the contractor?” Consider the effect on both current and future requirements. Sometimes an unreasonable negotiation result may be better than the available alternatives.

- What is the contractor's BATNA?

Consider how badly the contractor needs the contract. It may be attractive for a number of reasons (e.g., employment of contractor resources, overhead allocation, or technology advances). It could be that the contractor has no equally attractive business opportunities.

- How can you make the Government position stronger vs. the contractor's position?

You can make the Government's position relatively stronger by strengthening the Government's position or weakening the contractor's position. One of the most effective ways of weakening the contractor's position is to introduce competition.

**Return from a Walkout.** Never walkout unless other alternatives appear more attractive. However, you must remain open to returning to the negotiation table if things change, particularly if the contractor becomes more reasonable. Knowledge of the relative strength of your negotiation position will define your power throughout the remainder of the negotiations.

7.1 - **Using Win/Win Tactics**

7.2 - **Identifying Win/Lose Tactics And Appropriate Countermeasures**

**Endless Array of Tactics.** There is an almost endless array of negotiation tactics. Many are designed to foster win/win results, but others are orientated toward win/lose approaches to negotiation. Most have several variations and can be used in conjunction with other tactics depending on the unique circumstances surrounding the negotiation.

7.0 Chapter Introduction

7.1 Using Win/Win Tactics

**Tactics for Win/Win Results.** The tactics outlined in this section are generally used to facilitate win/win results. Accordingly, countermeasures are generally not necessary. However, even win/win tactics can be abused and used as negotiating ploys by win/lose negotiators. Countermeasures to win/lose use are identified for each tactic throughout this section. For most tactics, there are more countermeasures than those described in this section.

**Forbearance.** Forbearance is the act of refraining or abstaining from action. In negotiation forbearance allows both parties to agree to disagree and move on to the next issue without making a commitment one way or another.

- **Win/Win Use.** When you and the contractor's negotiator disagree on an issue, you can use
forbearance to prevent the negotiation from bogging down on that issue. Instead, you can search for issues where you can agree. Delaying action affords you both more time to view the unresolved issue in a different light.

- **Win/Lose Use.** Forbearance can be used by win/lose negotiators to stall agreement on any issue and place increasing pressure on the other party to make concessions.

- **Countermeasure To Win/Lose Use.** Offer to trade concessions on areas of disagreement. You make a concession on one issue in return for a contractor concession of equal importance.

**Questioning.** Questioning involves the use of questions to probe the position of the other party.

- **Win/Win Use.** You can ask questions for many useful win/win purposes, including:
  - Obtaining additional facts or specific information on the other party's position.
  - Seeking a specific response, such as "What is the best you can do?"
  - Identifying an alternative by using a question that begins with "Have you considered .?"
  - Breaking impasses using questions such as, "Why.?" or "Suppose.?"
  - Assisting the other party in reaching agreement with questions such as, "When can you start work?" Such questions can often precipitate a settlement.

- **Win/Lose Use.** A win/lose negotiator might question you in an attempt to gain information on the limits of your negotiation position. For example, a negotiator might ask "How much money is available for this contract?" If you answer honestly, the negotiator can adopt that figure as the contractor's negotiation objective for the remainder of the negotiation.

- **Countermeasure To Win/Lose Use.** If you suspect questioning is being used to obtain win/lose results, counter by either:
  - Not answering the question;
  - Rephrasing the question into a question that you can answer without harming your negotiation position;
  - Responding with another question; or
  - Just listening.

**Trial Balloon.** A trial balloon is a tentative plan offered to test the reaction of a particular audience. You can offer a trial balloon by presenting the contractor's negotiator with an offer prefaced with the words "what if .." Without committing yourself, you can politely bring up solutions for discussion and give the contractor's negotiator the right to accept, reject, or offer an alternative without making a firm commitment. For example, you might say, “How would your company feel about this alternative?”

- **Win/Win Use.** Using this tactic allows you to suggest win/win solutions. It can be particularly useful if you phrase the trial balloon in a way that encourages the contractor's negotiator to offer alternative solutions.

- **Win/Lose Use.** A win/lose negotiator might use a trial balloon as a trap. For example, the negotiator might offer a price for settlement. If you accept, the negotiator finds a reason not to accept it. The negotiator gains insight into your objective without giving up anything.

- **Countermeasure To Win/Lose Use.** When in doubt about the acceptability of a trial balloon, take time to formulate your response. Trial balloons often require substantial time to answer and generally cannot be analyzed on the spot. Be particularly careful when accepting the trial balloon that would require you to move to the limit of your negotiating range.

**Alternative Positions.** By offering two or more alternative positions at the same time, you can indicate that you would be willing to accept more than one way of settling a particular issue or group of issues. It is different than the trial balloon, because you are making a commitment to accept any option that the contractor's negotiator selects.

- **Win/Win Use.** You offer alternatives acceptable to the Government. The contractor's negotiator
has the opportunity to select the option or alternative course of action most favorable to the contractor's position. You gain an acceptable resolution, and the cost to the contractor's position is minimized. In addition, the selection process gives the contractor's negotiator a sense of ownership in the solution. That sense of ownership may improve the general negotiation atmosphere and lead to the satisfactory resolution of other issues.

- **Win/Lose Use.** A win/lose negotiator might offer two or more unacceptable solutions to key issues. When you refuse them all, the negotiator could use your refusal to support a charge that you are being unreasonable.

- **Countermeasure To Win/Lose Use.** The pros and cons of each alternative position may not be readily apparent. Spend enough time to thoroughly analyze the merits and drawbacks of every option before making your selection. Never accept an unreasonable solution simply because it is the most attractive one offered. If all alternatives are unacceptable, offer another alternative rather than simply rejecting them.

**Acceptance Time.** Acceptance time is a definite period of time that one party to a negotiation has to accept an offer by another party. Instead of forcing a quick decision, you can use this tactic to deliberately give the contractor's negotiator more time to grasp your solution or ideas.

- **Win/Win Use.** You can increase acceptance time by making an offer near the end of the day and then suggesting a break in negotiations until the next day. Overnight, the negotiator will have time to think about your offer and maybe discuss it with higher management. Negotiators, like people in general, need time to accept something new or different.

- **Win/Lose Use.** A win/lose negotiator might use acceptance time as a delaying tactic. It could be particularly useful when you are under severe time pressure or the momentum of the negotiation appears to be in your favor.

- **Countermeasure To Win/Lose Use.** Do not take too much time to respond to an offer because the momentum could be lost for quick agreement. Taking too much time could also allow a win/lose negotiator an opportunity to develop further delaying tactics.

**Brainstorming.** Brainstorming is a technique to develop alternative solutions through an unrestrained exchange of ideas. Negotiators using this tactic think out loud and openly discuss many alternative solutions or ways to resolve issues. No value judgment is placed on any idea during the brainstorming session. Ideas are simply recorded for later evaluation and possible use.

- **Win/Win Use.** When negotiators are sincere and open to new ideas, brainstorming can be a useful tactic to identify a wide variety of alternatives on ways to reach a win/win result. During the brainstorming session and later evaluation of the ideas presented, new insights can also be gained on the hidden pressures and needs that the parties involved bring to the negotiation.

- **Win/Lose Use.** For brainstorming to work, the negotiators must be sincere and open to new ideas. A win/lose negotiator who is not sincere could use a brainstorming session to gain information about alternatives that another negotiator might be willing to accept, while revealing nothing. That insight could then be used to win/lose negotiator's advantage for the remainder of the negotiation.

- **Countermeasure To Win/Lose Use.** The win/lose counter is to simply say nothing and listen. Either both parties share ideas or neither shares.

**Salami.** The negotiator using this tactic makes demands one demand at a time rather than requesting everything all at once.

- **Win/Win Use.** Using the salami approach permits you to divide complex issues into more understandable components. You have an opportunity to fully explain and sell each position before moving on to another issue. Clear understanding positions on these components can give you a better understanding of different positions on the overall issue. Its like a complicated mathematics problem. Most people cannot look at the problem and tell you the answer. They must complete all the individual calculations needed to find that answer.

- **Win/Lose Use.** A win/lose negotiator might use this technique to win concessions on a variety of
issues, before you realize just how many issues there are. Before you know it, you have negotiated away all your flexibility and you have not even gotten to the tough issues.

- **Countermeasure To Win/Lose Use.** When you suspect the other party is a win/lose negotiator, the best countermeasure is to make the negotiator specify all demands before you make your first concession. Refuse piecemeal results.

*Blanketing.* Blanketing is the opposite of the salami approach. It is designed to get all the issues on the table at the beginning of the negotiation. Negotiators using the blanketing tactic open the negotiation by outlining all their demands at once.

- **Win/Win Use.** When used by win/win negotiators, this tactic puts all of the issues on the table, so that everyone understands the magnitude of the negotiation task. Otherwise, substantial time may be wasted on trivial issues while key issues are left to be squeezed in at the end.

- **Win/Lose Use.** A win/lose negotiator can use this tactic to bury you like a heavy snowfall blankets a city and with the same effect -- paralysis. The negotiator hopes that you will be overwhelmed with the extent of all the demands and that you will not be able to dig out the key issues until its too late.

- **Countermeasure To Win/Lose Use.** Before making any concessions, prioritize the issues involved to determine what is really essential to the other party and how important each issue is to the Government.

*Bracketing.* A bracket is a group or class of issues or solutions that are linked together. Negotiators can use this technique to identify issues that are critical to a mutually satisfactory result.

- **Win/Win Use.** You can use bracketing to group major issues in an attempt to reach a mutually satisfactory result on those issues. This tactic can be particularly useful when there are a large number of issues, but only a few are critical. It may be impossible to reach a satisfactory result on every issue in the bracket, but you can reach a result that provides overall satisfaction. Once you reach a satisfactory result on the critical issues, you should be able to resolve the relatively less important issues more quickly.

- **Win/Lose Use.** A win/lose negotiator might attempt to group issues in a way that resolves the issues critical to him/her but leaves your critical issues unresolved. In that situation, you might trade away your flexibility only to find that the really important issues are still unresolved.

- **Countermeasure To Win/Lose Use.** Make sure the brackets include your critical issues. To maintain more flexibility, you might also consider qualified or tentative acceptance of the results. Later if you feel that the results are unfair, you can withdraw your acceptance.

### 7.2 Identifying Win/Lose Tactics And Appropriate Countermeasures

*Tactics for Win/Lose Results.* The tactics in this section are generally considered win/lose tactics because they represent negotiation ploys or ways to facilitate negotiation objectives by deceiving the other party. Because of the inherently dishonest nature of these win/lose tactics, they are not generally not recommended for negotiators seeking win/win results.

Nevertheless, by understanding these tactics, you will be better able to defend against their successful application. Recognition is the universal countermeasure. In addition, the employment of some win/lose tactics by win/win negotiators may sometimes be desirable when facing a win/lose negotiator.

*Funny Money.* Many issues in Government contract negotiations relate to percentages, factors, or other estimating relationships. Bargaining on these relationships is essential to reaching a mutually satisfactory result. However, these relationships can become funny money if you allow a negotiator to use them to distract you from their effect on the total contract.

- **Use.** A win/lose negotiator might use these relationships to distract your attention from the true effect on cost or price. For example, a negotiator might say "The Government's position on material overhead is 7.0 percent; the corporation's position is 6.0 percent. The corporation's position on manufacturing overhead is 111.0 percent; the Government's position is 110.0 percent. Since the difference is 1.0 percent in both cases, we propose a compromise where we accept your position on material overhead and you accept our position on G&A expense." That sounds like an even swap until you realize that the contract allocation base for material overhead is...
$75,000 and the base for manufacturing overhead is $800,000. That even swap would cost the Government $7,250.

- **Countermeasure.** Translate all funny money terms to their actual monetary equivalent. For example, when negotiating indirect costs, always consider the effect of rate changes on total cost or price.

**Surprise.** Negotiators may introduce a behavior, issue, or goal at an unexpected point in the proceedings. The negotiator plans an apparently spontaneous event (e.g., an emotional outburst) to surprise or shock the other negotiator.

- **Use.** In general, the surprise tactic is used to disrupt negotiations and move you away from your negotiation plan. The win/lose negotiator hopes that you will have an emotional response (e.g., anger, shock, or even fear) to the surprise. The further hope is that emotion will adversely affect your negotiation efforts. Anger might cause you to lash out and make statements that can later be used to show that you are unreasonable. Shock or fear might cause you to capitulate on a particular issue to avoid further and possibly more intense conflict.

- **Countermeasure.** Knowledge can be the best countermeasure. Some negotiators are known for their use of surprise tactics (e.g., outbursts of anger). A display that might be frightening if you do not expect it. It can be almost entertaining if you do. Surprised or not, do not respond until you are prepared. When necessary, call for a team caucus to make sure that you are responding with reason and not emotion (e.g., anger or frustration).

**Undermining.** The negotiator using this tactic attempts to put the other party on the defensive using threats, insults, or ultimatums. Although this tactic often backfires because most people resent verbal attacks, it can sometimes be effective when used against an easily intimidated negotiator.

- **Use.** The negotiator using this risky tactic hopes to gain concessions by bullying the other party. Some contractor negotiators have tried to lower the confidence of the Government negotiator by making negative comments about the competence of Government personnel and their frustration with the "red tape" involved in selling to Federal agencies.

- **Countermeasure.** There are several countermeasures to undermining:
  - If the threat is unethical, unlawful, or immoral, state that you intend to report the threat to the proper authorities (e.g., the negotiator's higher-level management).
  - Explain the long-range risks and costs that would result if the contractor party decides to carry out the threat.
  - Play dumb by failing to understand the threat and go on to the next issue.
  - Do not become shaken or emotional when this tactic takes the form of an insult. Insist on respect but continue to be businesslike and polite.

**Silence.** Silence is the absence of mention. In other words, a negotiator using this tactic does not say anything about a negotiation point. The primary hope is that the issue will not come up. If the issue does come up, the negotiator remains silent or avoids it by talking about something else.

- **Use.** This tactic is generally used when negotiators do not want to disclose weaknesses in their position. For example, a contractor trying to sell parts to the Government might not want to mention the fact that the parts are not covered by any warranty. The tactic is also used when negotiators want to obtain information by letting the other party do the talking. In this case, some negotiators feel obligated to talk and reveal information on their position when the other party is deliberately silent. Sometimes these negotiators will even end up talking themselves into accepting the other party's positions.

- **Countermeasure.** Persistently ask effective questions to uncover information on the avoided topic.

**Feinting.** Feinting is the use of a pretense or action designed to mislead. In negotiations, this tactic normally involves the use of true but misleading statement or behavior.

- **Use.** Feinting gives the other negotiator a false impression or deceives the negotiator into...
believing something that is not true. For example, a contractor might feint by telling you that a construction project had already begun when only some minor tree clearing had taken place. In fact, the contractor might be unable to start construction because the necessary earth-moving equipment is still being used on another job.

- **Countermeasure.** Ask probing questions to determine the real situation or bring out the hidden topic. For the example above, the obvious question would be “How much work has been completed?”

**Limited Authority.** When large organizations accept a position because related actions have already been completed. For example, the negotiator may present you with a signed subcontract and tell you that the subcontract cost is no longer subject to negotiation because the subcontract price has been set.

- **Countermeasure.** Insist that everything is negotiable. For the example above, point out that even if cost is an actual cost, the burden for proving reasonableness rests with the contractor (FAR 31.201-3).

**Bogey.** A bogey is standard of performance set up as a mark to be attained. A negotiator using the bogey tactic blames the negotiation position on a standard set by a third party or a situation beyond the negotiator's control (e.g., management policy). Any reason might be used as long as it is beyond the negotiator's control.

- **Use.** Win/lose negotiators using the bogey tactic attempt to convince you that they do not have authority to negotiate the issue because the bogey is beyond their control. They hope that this lack of authority will lower your expectations without you blaming them. Unfortunately, many Government negotiators use this tactic with statements such as "This is the audit-recommended rate, I have to use it."

- **Countermeasure.** Bogey countermeasures include:
  - Question the reasonableness of the bogey and stand firm on your position. In the example above, a contractor might question why you think the audit-recommended rate is fair and reasonable.
  - Offer to negotiate with the person or persons responsible for the bogey.
  - Counter the bogey directly. In the example above, the contractor might state that other negotiators in your office have accepted the proposed rate.

**Crunch.** The crunch tactic is designed to take another bite at your position no matter how reasonable it is. The user of this tactic is never satisfied and responds in words such as, “You have to do better than that,” or “That is not good enough.”

- **Use.** Win/lose negotiators using this tactic are attempting to make you doubt the reasonableness of your own position, without offering a specific alternative. The tactic may even make you grateful for a second chance.

- **Countermeasure.** Keep the burden of proof on the contractor by asking the negotiator for specifics. It is not enough to say that your position is not good enough. If you feel that your position is reasonable. Do not move until the contractor offers information that puts that reasonableness in doubt.

**Decoy.** A decoy is a person or thing that lures you into danger. In negotiations, the danger is an unsatisfactory outcome. The lure is a position or issue that appears important to the negotiator, but in reality is not. The issue or position can be completely fabricated or one whose importance is simply blown way out of proportion.

- **Use.** Negotiators using this tactic intend to trade the decoy for a concession of value. Effectively applied, this tactic enables the user to obtain a valuable concession without giving up anything important in return. For example, the contractor might offer to grudgingly concede on a minor estimating error in return for your concession on a more important issue. The actual error might be real or deliberately placed for you to find.

- **Countermeasure.** Decoy countermeasures include:
- Conceding the decoy issue and holding out on the important issues.
- Calling the negotiator's bluff by challenging the validity or importance of the decoy issue.

**Legitimacy.** Legitimacy is the state or condition of complying with established rules and standards. Negotiators often rely on commonly accepted standards (e.g., past practice, official policy, or written documents) to support a negotiation position.

- **Use.** Win/lose negotiators might use questionable or nonexistent standards to support their negotiation position. For example, the negotiator might say "This is the catalog price." By conveying legitimacy on the price, the negotiator hopes to reduce or eliminate questions. Most people are reluctant to challenge the status quo or question a position that is supported by an official document.

- **Countermeasure.** Consider generally accepted standards, but do not accept them blindly. Insist that everything is negotiable. For example, the catalog price cited above might be based on sales of 10 or 20 units to retail buyers, when you are negotiating to buy 10,000 units. You should consider the catalog price, but use all available information to negotiate a fair and reasonable contract price.

8.0 - **Introduction**

**Competitive Discussions (FAR 15.306(d) and FAR 15.307).** Competitive discussions are meaningful negotiations conducted as part of a competitive acquisition. The primary objective is to maximize the Government's ability to obtain best value, based on the requirement and the evaluation factors set forth in the solicitation.

- **Discussions:**
  - Are conducted with each contractor determined to be within the competitive range.
  - With each contractor are tailored to that contractor’s proposal.
  - Consider significant weaknesses, deficiencies, and other aspects of each contractor’s proposal that could be altered or explained to materially enhance the proposal's potential for contract award.

- At the conclusion of discussions, each contractor still in the competitive range must be given an opportunity to submit a final proposal revision by an established cut-off date.

- The final source selection decision is then based on a comparative proposal assessment against all source selection criteria established in the solicitation.

**Discussion Steps.** The following flowchart shows the steps in conducting competitive discussions:
8.1 Recognizing The Steps For Competitive Discussions

*Principal Negotiator Responsibilities.* The principal negotiator must assume leadership responsibility during the discussion conference even if the principal negotiator is not the team leader at other times. This includes:

- Actively leading the team throughout discussions;
- Opening the discussion conference;
- Reviewing facts and identifying discussion issues;
- Bargaining on the issues;
- Obtaining interim proposal revisions if necessary;
Eliminating contractors from the competitive range when appropriate; and
Requesting a final proposal revision from each contractor.

**Actively Leading the Government Team.** Your key leadership responsibilities when leading a competitive discussion team are the same as they would be if you were leading a noncompetitive negotiation team. (See Section 4.1 for more information.)

- Assure that preparations are complete before opening the discussion conference.
- Assure that team support is available when needed.
- Control team member participation.
- Use caucuses to maintain a unified government position.
- Use breaks to relieve tension and control the pace of discussions.

**Opening the Discussion Conference.** Most points that you need to consider when opening a discussion are the same ones that you should address when opening a noncompetitive negotiation. (See Section 4.1 for more information.)

- Greet the contractor's team.
- Take time for introductions.
- Help attendees feel more at ease.
- Briefly review background information.
- Emphasize the goal of a win/win outcome.
- Review the discussion agenda.

However, you do need to emphasize that competitive discussions are not the same as noncompetitive negotiations. Point out that:

- Discussions will not involve the offers and counteroffers common in most noncompetitive negotiations.

  - The contracting officer may:
    - Request or allow a proposal revision during discussions to clarify the contractor's position for further discussion.
    - Refuse to accept a proposal revision when one was not requested.

- The Government will rely on the forces of competition to obtain a win/win result.

  - After discussions, each contractor will be given an opportunity to submit a final proposal revision.
  - The Government will then make contract award to the firm whose proposal offers the best value given the contract requirements and the evaluation criteria for contract award.

**Reviewing Facts And Identifying Discussion Issues.** Your initial review of the facts in competitive discussions should be similar to your initial review of the facts in noncompetitive negotiations. (See Section 4.1 for more information.)

- Pay special attention to areas where issues are common.
- Summarize the results of any exchange that took place prior to discussions.
- Conduct additional fact-finding when necessary.

Instead of summarizing the areas of agreement and disagreement as you would in a noncompetitive negotiation, you should summarize issues identified for discussion. Generally, the issues will be related to:

- Proposal deficiencies;
• Significant proposal weaknesses; or
• Other proposal aspects that could, in the opinion of the contracting officer, be altered or explained to materially enhance the proposal's potential for contract award.


Like noncompetitive negotiations, bargaining in competitive discussions includes persuasion, alteration of assumptions and positions. Discussions should address issues related to price, schedule, technical requirements, contract type, or other terms of the proposed contract. Instead of attempting to reach a final agreement, bargaining in a competitive situation should be directed toward achieving a mutual understanding of the issues that should be addressed in the contractor's final proposal revision (FPR). Any changes in contract requirements will require a solicitation amendment to assure that all contractors are proposing to meet the same contract requirements.

- Follow Your Discussion Plan. Maintain the initiative throughout the discussions by following your discussion plan.
  - Use your agenda to address the issues.
  - Ask questions. Listen and evaluate the answers for responsiveness, truth, and consistency.
  - Employ appropriate tactics and countermeasures to achieve win/win results.

- Explain That Proposal Deficiencies Must Be Corrected. The term "deficiency" is used to describe a material failure of a proposal to meet a Government requirement or a combination of significant weaknesses in a proposal that increases the risk of unsuccessful contract performance to an unacceptable level.
  - If the proposal contains a deficiency, discussions must lead the contractor to the area of concern so that the contractor will have an opportunity to improve its proposal by correcting the deficiency. For example, if the proposed project manager does not meet minimum contract requirements, point that out to the contractor.
  - Never provide suggestions on how to correct the deficiency.
  - Emphasize that, unless proposal deficiencies are corrected, any proposal evaluation must consider the unacceptable level of performance risk associated with the deficiencies.


- Explain That Correcting Weaknesses Will Improve the Proposal. A weakness is a flaw in the proposal that increases the risk of unsuccessful contract performance. A significant weakness is a flaw that appreciably increases the risk of unacceptable contract performance.
  - If the proposal contains a significant weakness, you should advise the contractor and provide information on the general area of the weakness. For example, if proposed personnel appear only minimally qualified in the skills required for contract performance, point that out to the contractor. Do not merely restate the solicitation requirements.
  - You are not required to discuss every aspect of a proposal that receives less than the maximum possible rating. However, you must not conduct prejudicially unequal discussions. For example, you must not discuss every proposal weakness (even the smallest) with one contractor and only significant weaknesses with another.
  - Never provide suggestions on how to correct any weakness.
  - Emphasize that, unless proposal weaknesses are corrected, any proposal evaluation must consider the increased level of performance risk associated with the weaknesses.

- Identify Other Proposal Aspects for Possible Improvement
  - Emphasize that award(s) will be made to the firm(s) whose proposal(s) provide(s) the
best value to the Government considering the evaluation criteria in the solicitation.

- Where the solicitation states that evaluation credit will be given for technical solutions exceeding mandatory minimums, you may:
  - Negotiate for increased performance beyond any mandatory minimums; or
  - Suggest that a lower-priced proposal that meets any mandatory minimum requirements would be more competitive than a higher-priced proposal that exceeds those requirements in ways not integral to the design.

- If your analysis indicates that the proposed cost or price is unreasonably high, advise the contractor and provide the basis for your analysis.

- If your analysis indicates that the proposed cost is unrealistically low for the work required, advise the contractor and provide the basis for your analysis (Biospheric, Inc., B-278278, Jan. 14, 1998--Text of decision available for viewing in PDF Format).
  - For cost-reimbursement proposals, remind the contractor that the proposed cost may be adjusted for evaluation based on the most probable cost to the Government.
  - For fixed-price proposals, remind the contractor that the unrealistically low price will be considered in appropriate areas of proposal evaluation (e.g., performance risk).

- **Never Engage in Inappropriate Conduct.** Never engage or permit team members to engage in conduct that:
  - Favors one contractor over another;
  - Reveals a contractor's technical solution, including unique technology, innovative and unique uses of commercial items, or any information that would compromise a contractor's intellectual property to another contractor;
  - Reveals a contractor's price without that contractor's permission.
  - Reveals the names of individuals providing reference information about a contractor's past performance; or
  - Knowingly furnishes source selection information in violation of law or regulation.

- **Never Mislead the Contractor.** Never engage in conduct that misleads the contractor into submitting an FPR that fails to address the concerns identified during the initial proposal evaluation. For example, do not press a contractor to review its proposal for additional cost savings when the proposal is already appears unrealistically low. Such discussions could mislead the contractor into submitting an FPR that reduces price without addressing cost realism. That FPR would likely be evaluated as offering less value to the Government than the original proposal.

**Obtaining Interim Proposal Revisions (FAR 15.307(b)).** Never require contractor's to submit more information than necessary for discussions and proposal evaluation. Normally, that means that discussions will be based on the contractor's initial proposal. However, the contracting officer may request or allow a proposal revision during discussions to clarify the contractor's position for further discussion. **Eliminating Contractors from the Competitive Range (FAR 15.306(d)(4) and FAR 15.307).** After discussions begin, the contracting officer may determine that a particular firm is no longer among the most highly rated contractors being considered for contract award and eliminate the firm from the competitive range.
  - The contracting officer is not required to discuss all material aspects of the proposal with the contractor or provide the contractor an opportunity to revise its proposal before eliminating the contractor from the competitive range.
  - When the contracting officer eliminates a contractor from the competitive range, you must not
request or accept any further proposal revisions from the contractor.

Requesting a Final Proposal Revision (FAR 15.307(b)). At the conclusion of discussions, you must give each contractor still in the competitive range an opportunity to submit an FPR. All requests for an FPR must be in writing. The request should be brief, but it must:

- Establish a common cut-off date for receipt of FPRs from all contractors still in the competitive range; and
- Advise each contractor that:
  - Its FPR must be in writing, and
  - The Government intends to make award without obtaining further revisions.

8.2 Conducting A Comparative Assessment Of Final Proposals

Source Selection Plan. The assessment of the final proposal revision (FPR) must be conducted in accordance with the source selection plan established prior to solicitation release. The format of the plan will depend on agency and contracting activity policies. However, it should include or provide for the following:

- Basis for the best value decision;
- Source selection organization;
- Proposal evaluation criteria; and
- Evaluation procedures.

Basis for the Best Value Decision (FAR 15.101-1 and FAR 15.101-2). In a competitive acquisition situation, the proposal evaluation and source selection decision process must be designed to foster an impartial and comprehensive evaluation of contractors’ proposals, leading to selection of the proposal(s) that provide the best value to the Government. Depending on the acquisition situation, the best value may result from accepting the lowest-price technically acceptable proposal or from considering tradeoffs between cost/price and non-cost/price factors.

- A lowest-price technically acceptable proposal assessment is appropriate when best value is expected to result from selection of the technically acceptable proposal with the lowest evaluated price.
- A proposal assessment process that considers tradeoffs between cost/price and non-cost/price factors (e.g., technical and past performance evaluations) is appropriate when it may be in the Government's best interest to consider award to other than the lowest-priced contractor or other than the highest technically rated contractor.

Source Selection Organization (FAR 15.303). The source selection organization will vary based on a number of factors including the basis for the source selection decision, agency and contracting activity policies, and the size of the projected contract(s).

- When the lowest-priced technically acceptable proposal assessment is used, the organization is usually informal.
  - The contracting officer is the source selection authority (SSA) responsible for making the source selection decision.
  - Depending on the situation, the contracting officer may or may not require technical or audit support in proposal analysis.
- When a trade-off assessment process is used, the organization is usually more formal.
  - The contracting officer is normally the SSA, but the agency head may appoint another individual as the SSA for an acquisition or group of acquisitions.
  - Support is normally provided by a designated team or teams of experts.
The team that actually reviews the contractor's proposals may be known as the "source selection evaluation board (SSEB)," "source evaluation board (SEB)," "source evaluation team (SET)," or another similar name. These experts may be further divided into subteams to evaluate different aspects of each contractor's proposal (e.g., cost/price, technical, and past performance).

The source selection organization structure may also include a second team of senior-level advisors. These advisors may be known as the "source selection advisory council (SSAC)" or by another similar name. Their purpose is to advise the SSA on the conduct of the source selection and assist the SSA in analyzing the source selection evaluation results.

Proposal Evaluation Criteria (FAR 15.101-1 and FAR 15.101-2). Proposal evaluation must only consider the criteria identified in the solicitation.

- When using a lowest-price technically acceptable source selection assessment, the solicitation must specify that award will be made to the firm that offers the lowest evaluated price for a proposal that meets or exceeds the acceptability standards for non-cost/price factors.

- When using an assessment process that considers tradeoffs between cost/price and non-cost/price factors, the solicitation must clearly:
  - Identify all evaluation factors and significant subfactors that will affect the contract award decision;
  - State whether all evaluation factors other than cost/price, when combined, are significantly more important than, approximately equal to, or significantly less important than cost or price; and
  - Indicate the relative importance of non-cost/price factors.
  - If no other information is provided, non-cost/price factors are normally assumed to have been identified in the solicitation in their relative order of importance.
  - Other information may be provided in the solicitation (e.g., a statement that together Factors 2 and 3 are approximately equal in importance to Factor 1).

Evaluation Procedures. Proposals must be evaluated using procedures defined before the solicitation is released.

- When using a lowest-price technically acceptable source selection assessment, you must only evaluate technical proposals for acceptability. Never attempt to make tradeoffs between cost/price and non-cost/price factors.

- When using an assessment process that considers tradeoffs between cost/price and non-cost/price factors, the proposal evaluation procedures:
  - Must provide for an assessment of the contractor's ability to successfully perform the prospective contract.
  - Use any rating or combination of methods (e.g., color ratings, adjectival ratings, numerical ratings, or ordinal ratings) acceptable to your contracting activity and appropriate for the contracting situation.
  - Rate each proposal considering all non-cost/price factors identified in the solicitation. For each factor, the assigned rating must consider the proposal's merit in comparison with a standard for acceptability established before the solicitation was released.
  - Evaluate the cost/price reasonableness and cost realism of each proposal.
  - Must not compare proposals against each other.
8.3 Communicating Assessment Results

Differences in Communication Requirements (FAR 15.304(c)). The requirement to effectively communicate findings varies based on the proposal assessment process.

- When award will be made to the responsible firm with the low-price technically acceptable proposal, little documentation and communication is required in the proposal assessment process unless the low-priced proposal is considered unacceptable for some reason. Then the contracting officer must clearly document the rationale for rejecting the lowest-priced proposal (e.g., nonresponsible offeror, unbalanced pricing, or unrealistic pricing).

- When award will be made based on a tradeoff assessment, substantially more documentation is normally required.

  o Each technical proposal must be evaluated and a rating assigned in accordance with the source selection plan. The rationale behind the assigned rating must be clearly documented.

  o Past performance must be evaluated unless the contracting officer documents the reason why past performance is not an appropriate evaluation factor. When past performance is evaluated, the evaluation must follow the source selection plan and the results clearly documented.

  o Each cost/price proposal must be evaluated for price reasonableness. In many cases, the cost/price proposal must also be evaluated for cost realism. The rationale behind any decision related to cost reasonableness or cost realism must be clearly documented.

Technical Evaluations for Tradeoff Assessments (FAR 15.305(a)(3)). In tradeoff assessments, the source selection plan typically requires the person(s) evaluating each contractor's technical proposal to consider factors such as compliance with solicitation requirements, technical excellence, management capability, personnel qualifications, and prior experience. The evaluation of each contractor's proposal must include:

- An overall assessment of the contractor's ability to accomplish the technical requirements of the contract

- A summary, matrix, or quantitative proposal rating using a rating method or combination of methods (e.g., color ratings, adjectival ratings, numerical ratings, or ordinal ratings) acceptable to your contracting activity and appropriate for the contracting situation.

  o Each proposal's merit must be considered for each evaluation factor based on a comparison with a preestablished standard for acceptability.

  o Each proposal rating must be supported by an appropriate narrative analysis. Ratings indicating that the proposal just met the standard for a particular factor, will normally require less documentation than ratings indicating superior, marginal, or unsatisfactory status.

Past Performance Evaluation for Tradeoff Assessments (FAR 15.305(a)(2)). Past performance information is one indicator of a contractor's ability to perform the contract successfully. The comparative assessment of past performance information:

- Is separate from the contracting officer's determination of contractor responsibility.

- Must consider:

  o The currency and relevance of past performance information;

  o The source of past performance information;

  o The context of the past performance information; and

  o General trends in contractor performance.

- Should consider relevant information related to:

  o Past performance information regarding predecessor companies;
- Key personnel who have relevant experience; and
- Subcontractors that will perform major or critical aspects of the requirement

May not rate a contractor favorably or unfavorably on past performance when:
- The contractor has no record of relevant past performance; or
- Information on past performance is not available.

Cost or Price Evaluation for Tradeoff Assessments (FAR 15.305(a)(1)). Cost/price evaluation represents the third element in tradeoff analyses.

- Evaluate price reasonableness. Use price analysis and if necessary cost analysis to determine whether the offered price is fair and reasonable. Documentation should alert the SSA to any price that is not:
  - Fair to the buyer;
  - Fair to the seller; and
  - Reasonable considering market conditions, available alternatives, price-related factors, and non-price factors.

- Evaluate cost realism when appropriate.
  - When the proposed contract is cost-reimbursement, cost realism analysis must be used to evaluate:
    - What the Government should realistically expect to pay for the proposed contract;
    - The contractor's understanding of proposed contract requirements; and
    - The contractor's ability to perform the proposed contract.
  - When the proposed contract is fixed-price, realism analysis may be used to evaluate the:
    - Financial risk associated with contract performance;
    - The contractor's understanding of proposed contract requirements; and
    - The contractor's ability to perform the proposed contract.

Evaluation Summary. The presentation to the SSA should follow agency and contracting activity requirements.
- As a minimum, the presentation should include an evaluation summary that combines the technical, past performance, and cost/price evaluations for each proposal.
  - Some contracting activities encourage evaluation teams to assign overall ratings or to rank proposals based on proposal evaluation criteria. These overall ratings or rankings become recommendations to the SSA. Other contracting activities encourage an SSA decision based on the proposal analyses without further interpretation.

8.4 Identifying Documentation Requirements

Need for Documentation. Documentation of competitive discussions must fully present the rationale use in making the contract award decision. It must identify the significant facts and issues that affected the negotiated contract price.
- It should include the same information required to document a noncompetitive negotiation: (See Section 4.3)
  - The proposals and any related information submitted by the contractors;
  - The Price Negotiation Memorandum (PNM);
  - Copies or references to the location of any technical or audit analysis reports considered
during the negotiation; and
   o A record of any request for additional contractor information to support the proposal and
     the contractor’s response.

- It should also include:
  o Any documentation related to establishment of the competitive range; and
  o The SSA’s source selection decision.

*Price Negotiation Memorandum (FAR 15.406-3)*, The general requirements for a PNM for a competitive
discussion are the same as the requirements for a PNM in a noncompetitive negotiation. (See *Section
4.3*) The major difference is related to the number of contractors involved.

- The following PNM elements describe the acquisition situation and only need to be addressed
  once:
  o Purpose of the negotiation (new contract, final pricing, etc.).
  o Description of the acquisition, including appropriate identifying numbers (e.g., RFP
    number).
  o To the extent such direction has a significant effect on the action, a discussion and
    quantification of the impact of direction given by Congress, other agencies, and higher-
    level officials (i.e., officials who would not normally exercise authority during the award
    and review process for the instant contract action).

- Other discussion specifics must be addressed for each contractor. Depending on agency and
  contracting activity policies and the complexity of the negotiations, these specifics may be
  addressed in the body of the PNM or by using an attachment for each contractor. The information
  must include:
  o Name, position, and organization of each person representing the contractor and the
    Government in negotiations.
  o The current status of any contractor systems (e.g., purchasing, estimating, accounting, or
    compensation) to the extent that they affected and were considered in the negotiation.
  o If the contractor was not required to submit cost or pricing data to support any price
    negotiation over the cost or pricing data threshold, the exception used (e.g. acquisition of
    a commercial item) and the basis for using it.
  o If the contractor was required to submit cost or pricing data, the extent to which the
    contracting officer:
    o Relied on the cost or pricing data submitted and used in negotiating price;
    o Recognized any cost or pricing data submitted as inaccurate, incomplete, or noncurrent:
      ▪ The action taken by the contracting officer as a result of that recognition;
      ▪ The action taken by the contractor as a result of that recognition; and
      ▪ The effect of the defective data on the price negotiated; or
    o Determined that an exception applied after the data were submitted and, therefore, did
      not consider the submission to be cost or pricing data.
  o A summary of the contractor's proposal, any field pricing assistance recommendations,
    including the reasons for any pertinent variances from them, the Government's
    negotiation objective, and the negotiated position.
  o When the determination of price reasonableness is based on cost analysis, the summary
    must address each major cost element.
  o When determination of price reasonableness is based on price analysis, the summary
must include the source and type of data used to support the determination.

- The most significant facts or considerations controlling the establishment of the prenegotiation objectives and the negotiated agreement including an explanation of any significant differences between the two positions.
- The basis for the profit/fee prenegotiation objective and the profit/fee negotiated.
- Documentation that the negotiated price is fair and reasonable.

**PNM Distribution (FAR 15.406-3(b)).** Whenever you obtain field pricing assistance to support your negotiation, you must forward a copy of the PNM to the office(s) providing field pricing assistance. When appropriate, you should also forward recommendations on how field pricing assistance can be made more effective.

**Technical and Audit Reports.** For competitive discussions, documentation should include the team evaluations of both the initial proposals and final proposal revision.

**Establishment of the Competitive Range.** Competitive range documentation must clearly outline the rationale used by the contracting officer in establishing a competitive range comprised of all the most highly rated proposals. When appropriate, documentation must also outline the rationale used to further reduce the competitive range for purposes of efficiency.

**Source Selection Decision.** Documentation of the SSA's source selection decision must clearly outline the rationale that the SSA used in making that decision. Clear documentation is particularly important if the decision does not appear to follow recommendations made to the SSA.