The Challenge

- Recognize Program Challenges Before It Is Too Late
  - Which part of the P….(Portfolio, Program, Project) is off baseline?
  - What are the ROOT CAUSES of current and future challenges?
  - Where changes NEED to happen, when should baselines change?

- Take A “Systems” Approach
  - Look at challenges … Constraints, Assumptions, Issues, Risk and Opportunities (CAIRO) for “systems”
    - Utilize analysis/assessment/wisdom or other frameworks
    - Link across Challenges, Resources, Evaluation, Schedule, and Technical (CREST)
  - Develop challenge based on schedule/cost models useful for management decisions
  - Take lean systems methods to facilitate observe, orient, decide, and act (OODA Loop) decision approach
Expansion to all Challenges

CAIRO - Constraints, Assumptions, Issues, Risk and Opportunities

- “Challenges” need to be managed – positive or negative
  - Relative to the program baseline in performance, schedule, costs
  - The consequence is in comparison to the baseline
- Assumptions start with program baselining process
  - They should inform the initial program “risk adjustment”
  - Track connection with resulting issues, risks, opportunities
- Issues are 100% probable, but you can mitigate impacts
- R&O focused on forward looking …not reactionary

• Challenges are focused on the future
Many Challenges .. more than risks

CAIRO … mnemonic

- Constraints … what are the parameters that establish the baseline. Are they still true!
- Assumptions … what is “assumed” will happen. Is it still true for this baseline?
- Issues … today's challenges
- Risks and Opportunities
  - Uncertainties, such as the level of labor productivity.
  - Ambiguities, such as the accuracy of cost estimates and schedules
    - These always occur but may have a range of impacts
  - Events that may or may not occur
    - These have both probability of occurring and impact ranges
A²W Framework and CREST Modeling (OSC models)

- Engages left and right brain analysis, assessment, and wisdom
- Translate subjective to objective range of uncertainty
- Links across quantitative knowledge area …
  - CREST - Challenges, Resources, Evaluation, Schedule, and Technical
- Utilizes statistics to recognize enough challenges/uncertainty …
  - CAIRO - Constraints, Assumptions, Issues, Risks, and Opportunities
- Utilizes schedule and cost baselines as bases for models
- Analyze past performance to inform future predictions
- Allows for quantitative ranges and adjustments
  - Vertically … lowest level is expanded as needed to clarify challenges
  - Horizontally … you statistically sum and correlate elements
- The result is a robust future representation of the program
  - Given observations/orientation … make informed decisions and act
What analysis are you doing?

- Objective analysis on programmatic data
  - Schedule with risk analysis
  - Cost with risk analysis—prior to the point estimate
  - Technical quantified risk/opportunities
  - Time-phased and tolerance-banded technical performance measures
  - Statistical estimate to complete (ETC) for cost and schedule
- ....

- Subjective assessment on processes
  - Determined the goodness of the processes/date .. transparency
  - Other framework … Olde Stone A²W frameworks model
Driessnack’s A2W Framework Dice*

*An OODA Loop Model

Complicated

Complex
**Analysis Die**

**Analysis**: separate whole into parts to analyze the whole and goodness of the baseline

**Scope** – what bounds of the effort

**Structure** – who are the players/stakeholders

**Lifecycle** – when do events happen

**Rules** – what institutional rules bound the effort

**Knowledge** – what processes/methods needed to accomplish effort
Assessment Die*

Assessment: judging the impact of the environment and events given the baseline

Energy – atmosphere is positive/negative
Decisions – timeliness and appropriateness
Stability – what is changing and how often
Linkage – how connected
Discipline – effectiveness and efficiency

*An Olde Stone Consulting Model
**Wisdom Die***

**Wisdom:** use of experience, knowledge, and good judgment in controlling the baseline

**Governance:** oversight effectiveness  
**Leadership** – effective/efficient  
**System** – the breadth of the view  
**Team** – dynamics, down, across, and up  
**Culture** - dynamics - is it a “high reliable” organizations?

*An Olde Stone Consulting Model*
Backup charts .. Might be useful
- CREST paper referenced in GAO-09-3 SP
- Mentions EVM throughout … linking quantitative data
  - NDIA EV/Risk linkage
- Discusses specific “best practices” in Chapters 18 and 19
Project EVM and RM Integration

Earned Value Management:

- Define & Organize Work
- Establish MR
- Issue Target Budgets
- Authorize Planning
- Plan Program
- Schedule (IMS)
- Establish PMB
- Authorize Work
- Status Schedules
- Measure Performance
- Compute Variance
- Analyze Results
- Plan Corrective Action
- Update EAC

Integrating Guidance:

- Use Risks to Establish Suitable MR
- Ensure MR Sufficient to Handle High-Probability Risk
- Incorporate Risk Mitigation Plans into Program Schedules & Budgets
- Use EV to Monitor Performance of Risk Mitigation Plans
- Identify Newly-Developing Risks & Opportunities
- Incorporate Risk Impacts into EAC

Risk Management:

- Plan Risk Management Activities
- Perform Risk Assessment
- Identify & Analyze Risk
- Determine Risk Exposure
- Develop Risk Handling Plans
- Assign Responsibility
- Execute Risk Handling Plans
- Monitor & Communicate Risks & Opportunities

Update Risk Register
• Link various data sets for improved analysis

NDIA Working group outlined integration of EV/Risk (figure 21)

Increase utilization of schedule risk analysis linked with cost models
DoD defines IPPD as, “A management process that integrates all activities from product concept through production/field support, using a multifunctional team, to simultaneously optimize the product and its manufacturing and sustainment processes to meet cost and performance objectives.”

Concurrent Development of Products and Processes
Processes should be developed concurrently with the products they support. It is critical that the processes used to manage, develop, manufacture, verify, test, deploy, operate, support, train people, and eventually dispose of the product be considered during product design and development.
Risk-Informed Decision Making (RIDM)

Identification of Alternatives
Identify Decision Alternatives (Recognizing Opportunities) in the Context of Objectives

Risk Analysis of Alternatives
Risk Analysis (Integrated Perspective) and Development of the Technical Basis for Deliberation

Risk-Informed Alternative Selection
Deliberate and Select an Alternative and Associated Performance Commitments Informed by (not solely based on) Risk Analysis

Continuous Risk Management (CRM)

Identify
Communicate and Document
Analyze
Control
Track
Plan

Conditions Necessitating Requirements Rebaselining

NASA Risk Handbook, figure 11
Level of Data

- Program level
  - Detail typically to level III WBS, integration of costs/schedule
- Contract level—run with EV engine tools
  - Detail to control account manager (CAM) level
- Major subcontract—may report separately
  - Likely has separate configuration control
- Control account manager (CAM) level
  - Level of responsible management, has “notebook” of data
  - Minimum level at which actual costs are recorded
- Work and planning package level
  - Basis of estimate, day-to-day schedules, and criteria for taking value
System Engineering Approach

- **Operational View**
  - Identifies what needs to be accomplished and by whom

- **Systems View**
  - Relates systems and characteristics to operational needs

- **Technical Standards View**
  - Prescribes standards and conventions

- **Operational Requirements and Capabilities**
  - Basic Technology Supportability
  - New Technical Capabilities

- What needs to be done
  - Who does it
  - Info Exchange required
  - Systems that support the info exchange

- Specific system capabilities required to satisfy info exchange
  - Technical standards criteria governing interoperable implementation of the capabilities