Draft FY18 NDAA Agile Definition

(f) Definitions.—In this section the term “Agile Acquisition”

(1) means acquisition pursuant to a methodology
for delivering multiple, rapid, incremental capabilities to the user for operational use, evaluation, and feedback; and

(2) involves—(A) the incremental development and fielding of capabilities, commonly called “spirals”, “spins”, or “sprints”, which can be measured in a few weeks or months; and (B) continuous participation and collaboration by users, testers, and requirements authorities.
• DoD has adopted, trained and implemented Agile concepts in acquisition since 2001

• Draft FY18 NDAA wording
  – Associates Agile software development practices with development of major hardware systems
  – Language confuses terms (spins, spirals, sprints)

• DAU teaches use of incremental, accelerated and tailored approaches in multi-disciplinary acquisition team exercises
Background

- Evolutionary Acquisition & Spiral Development (EA/SD) first adopted in 2001
- Spiral Development came out of software community as a response to the high number of large software development failures
  - Spiral model was defined by Barry Boehm in his 1988 article *A Spiral Model of Software Development and Enhancement*
  - Cyclical approach allowed users to provide feedback earlier and developers could identify potential trouble spots at an early stage
  - Concluded that it “was particularly applicable to large, complex, ambitious software systems.”
- EA, SD and Incremental Development further defined by AT&L in 2002 (Mr. Aldridge) “to reduce cycle time and speed delivery of advanced capability to our warfighters” as well as “for earlier delivery, agility, affordability, and risk reduction.”
Nov 2003 GAO report on EA/SD prepared for SASC concluded:

- DOD has made major improvements to its acquisition policy by adopting knowledge-based, evolutionary practices used by successful commercial companies. If properly applied, these best practices can put DOD’s decision makers in a better position to deliver high-quality products on time and within budget...

- ...next step is for DOD to provide the necessary controls to ensure a knowledge-based, evolutionary approach is followed... Recommends SECDEF strengthen DOD’s acquisition policy by requiring additional controls to ensure decision makers will follow a knowledge-based, evolutionary approach

- Congressional Program Commitment and Oversight. Another issue for Congress is how to carry out its responsibility to allocate defense spending. EA/SD poses potentially significant issues for congressional oversight, particularly for newly initiated weapon acquisition programs, in three areas:
  - Ambiguous initial program description
  - Lack of well-defined benchmarks
  - Funding projections potentially more volatile
Software Development Life Cycle Models

- Traditional
  - Waterfall
  - Incremental
  - Spiral

- Agile
  - Scrum
  - Extreme Programming (XP)
  - Adaptive Software Development
  - Dynamic System Development Method
  - Rapid Application Development
## Agile Manifesto

### Core Values

- Individuals and interactions over processes and tools
- Working software systems over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

### Principles

1. Continuous delivery of valuable software
2. Welcome changing requirements
3. Deliver working software in weeks
4. Work together daily
5. Build projects around motivated individuals
6. Face-to-face conversation
7. Working software is the measure of progress
8. Promote sustainable development
9. Good design enhances agility
10. Simplicity is essential
11. Self-organizing teams
12. Reflect on how to become more effective
KEY COMPONENTS OF THE SCRUM FRAMEWORK

- **4 Activities**
  - Sprint Planning
  - Daily Scrum
  - Sprint Review
  - Sprint Retrospective

- **3 Roles**
  - Product Owner
  - Development Team
  - ScrumMaster

- **3 Artifacts**
  - Product Backlog
  - Sprint Backlog
  - “Done” Software
Agile in Current DAU Curricula

• CLE 076- Introduction to Agile Software Acquisition
  – 5 Hour CLE dedicated to Agile SW Dev't

• ISA 101-Basic Information Systems Acquisition
  – 5 Agile related lessons

• ISA 201-Intermediate Information Systems Acquisition
  – Extensive coverage throughout course including dedicated lesson, student discussions and practical application

• ISA 301-Advanced Enterprise Information Systems Acquisition
  – Lecture and case study on Agile Culture in DoD

• ISA320 -Advanced Program Information Systems Acquisition
  – Two case studies which include analysis of agile software development

• ENG 301-Leadership in Engineering Defense Systems
  – Two hour lesson on SW development. Half of class is on Agile Methodologies. Mini exercise on agile metrics.
Agile in Program Management

• Concept of Agile addressed in terms of Evolutionary Acquisition, Spirals and Increments since 2003 in PM curriculum

Evolutionary Approach
DoDI 5000.2, May 2003

DoD Instruction 5000.2
May 2003

• Two development processes to implement Evolutionary Acquisition Strategy
  - Incremental Development: End-state requirement is known, and requirement will be met over time in several increments
  - Spiral Development: Desired capability is identified, but end-state requirements are not known at Program Initiation. Requirements for future increments depend upon technology maturation and user feedback from initial increments
• Evolutionary acquisition strategies shall be preferred approach to satisfying operational needs.
• Spiral development shall be the preferred process.

Each Increment Must Have...

- Increment 2
- Increment 3

Key Enablers

- Opened Requirements
- Open Systems Approach to facilitate Technology Insertion
- Resilient Sustainment Strategies consistent with Evolutionary Approach
- Managed as a Unique Acquisition

- Performance Parameter
- Schedule Goals (Acquisition Program)
- Test (if Required)
- Oversight Requirements
- that reflects consideration of Logistics; Personnel and Training; Environment, Health; Security Factors; Protection of Information; and Spectrum Management

- Managed as a Unique Acquisition
Agile in Program Management

• Agile / Accelerated / Urgent/ Rapid Acquisition currently addressed in:
  – ACQ 203, Intermediate Systems Acquisition, Part B
  – PMT 360, Program Management Office Course, Part B

ACQ 203

PMT 360
These decision points, milestones and phases are standard elements of the Defense Acquisition System; however, MDAs, with PM input, have full latitude to tailor programs in the most effective and efficient structure possible, unless constrained by statute.
Lessons Learned

Former USD AT&L Gansler brief to Naval Postgraduate School in 2008 stated the following Spiral findings to date:

- **Requirements**— Users must allow more flexibility with their requirements
  – Users must accept less capable systems (80% solution) earlier, then evolve to desired level in later blocks
  – Acquisition team must develop a long-term system view, not a narrow focus on current spiral

- **Budgets**
  – Total program cost estimating is more difficult due to requirements evolution
  – Cost must be viewed as a design constraint—otherwise program baselines may be less well defined
  – Must budget for R&D in future blocks while current block is underway

- **Logistics**
  – Spiral development creates greater demands on logistics concepts
  – Different system configurations impacts on sparing, training, maintenance, etc

- **Test and Evaluation**
  – Early operational feedback to shape development and formal testing
  – Test community must view partial capability of early blocks as a success

- **Program Management**
  – Generates higher intensity of contract action
  – Requires different skill mix in program office
  – Planning for Spiral “N+1” is a critical Spiral “N” task

*Spiral Development increases the need for disciplined program management*
Programs Using Agile

- Distributed Common Ground System-DCGS-AF
- PEO Battle Management -Air Operations Center (AOC)
- Reserve Component Automation Systems (RCAS)
Summary

• Concept of Agile, Spiral, Incremental & Rapid/Urgent Acquisition has existed for over 20 years in DoD acquisition
• DAU curriculum for PM and SE incorporates DoDI 5000.02 models & program tailoring to make full use of these strategies
• DAU E&T curriculum has extensive material on agile software development methodologies and practices
QUESTIONS?
FY17/18 Program Management Certification Training

Level I Certification

- **ACQ 101** Fundamentals of Systems Acquisition Management
  - 30 hrs, online
- **ENG 101** Fundamentals of Systems Planning, Research, Development, and Engineering
  - 35 hrs, online
- **CLB 007** Cost Analysis
  - 4 hrs, online
- **CLV 016** Introduction to Earned Value Management
  - 1 hr, online

Level II Certification

- **ACQ 202** Intermediate Systems Acquisition, Part I
  - 35 hrs, online
- **EVM 101** Introduction to Earned Value Management
  - 5 days classroom
- **PMT 251** Program Management Tools Part I
  - 54 hrs online
- **CON 121** Contracting Fundamentals
  - 12, 13, 10 hrs, online

Level III Certification

- **PMT 355** Program Manager’s Course Office Course
  - 50 hours online + 10 weeks classroom
- **PMT 360** Program Management Tools Office Course
  - 4 weeks classroom
- **SYS 202** Intermediate Systems Planning, Research, Development, & Engineering
  - 30 hrs, online
- **ACQ 315** Understanding Industry FY 16 Add
  - 4.5 days classroom

Total training for Level III: 632 hrs

**“Core Plus”**

- **PMT 360** Program Management Tools Office Course
  - 4 weeks classroom

Level I “Core Plus” Courses & CL Modules
(See DAU iCatalog)

Level II “Core Plus” Courses & CL Modules
(See DAU iCatalog)

Level III “Core Plus” Courses & CL Modules
(See DAU iCatalog)

PMT-401 and PMT-402 meet statutory requirement for PEO/ACAT I/II PM & Deputy PM (10 USC 1735)

- PMT 401 Program Manager’s Course
  - 10 weeks classroom
  - Potential ACAT I, IA, II, & III PMs, Dpty PMs
- PMT 402 Executive PM Course
  - 4 weeks classroom
  - PEOs & ACAT I, IA, II PMs & Deputy PMs

“Core Plus”

Highly Recommended for ACAT III PM & Deputy PM

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Spiral Model

- Risk-driven Process
- Each spiral identifies high risk problems and develops solutions
- Can combine waterfall, evolutionary, and incremental
- Each cycle ends in a review in which stakeholders agree on plans for the next cycle