Model for Knowledge-Based Acquisition Process

International Test & Evaluation Summit

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February 25, 2003
GAO's Best Practices Work

Common ground – commercial & DOD
- Goal – reduce risk
- Schedule pressures
- Funding limitations

Examined commercial & DOD practices
- Commercial firms gain knowledge earlier
  - Rigorous standards and processes followed
  - Technology & product development separated

Different incentives
- Commercial firms: testing can foster success
- DOD: testing may jeopardize program

Outcome
- Test to confirm v. test to discover
Cumulative Effect of Cost Growth on Development of 8 Weapon System Programs

FY 1998 Plan
FY 2003 Plan

FY ’03: $71.6 billion total

FY 1998 plan for completing development of 8 programs
$46.9 B

Additional investment needed under FY 2003 plan for completing the 8 programs
$24.7 B

1Source: Selected Acquisition Report data (12/31/96 and 12/31/01) on the 8 weapon systems among the highest R&D budget requests for FY 2003.
Note: All dollars are in constant FY 2003 dollars.
DOD’s Past Problems

Testing issues
- Test events are postponed or skipped
- Some tests are deficient
- Full system tests overly burdened

Examples
- F-22
- V-22
- ABL
- THAAD
T&E tells us where we are on the knowledge curve
Knowledge Point 1

**Technology Maturity**

**Definition**
- Customer’s requirements match available resources (technology, time, and funding)
- Should align with DOD’s milestone B

**Measurement**
- Technology readiness levels (TRL)

**Goal**
- Attain TRL 7 – component/subsystem demonstration in an operational environment
Knowledge-Based Approach to Testing

Level 1
Components Work Alone

Level 2
Components Work Together in Controlled Environment

Level 3
Full System Works Together in Realistic Environment
Knowledge Point 2

Design Maturity

Definition
• Product design can meet requirements
• Should align with CDR

Measurement
• Percent of engineering drawings complete

Goal
• 90% of drawings releasable to manufacturing
Knowledge Point 3

Production Process Maturity

Definition
• Product can be manufactured within targets
• Should align with milestone C

Measurement
• Percent of critical manufacturing processes in control

Goal
• 100% statistical control
T&E Challenges

• Preventing component & subsystem tasks from sliding to full system testing
• Completing system-level DT before production commitments
• Conducting T&E of integrated hardware and software
• Conducting T&E for spiral/capabilities-based acquisitions
More Information

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- Suggested reading