OSD DT&E: Implementing the Technology Maturity Vector

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October 25, 2007



Outline

DEVELOPMENTAL TEST & EVALUATION

- SSE Mission
- Systems Engineering Revitalization
- Emerging Systemic Issues
- DT&E Revitalization Focus
- DT&E Technology Maturity Initiative
- Pending Guidance Changes



Systems and Software Engineering Mission Statement

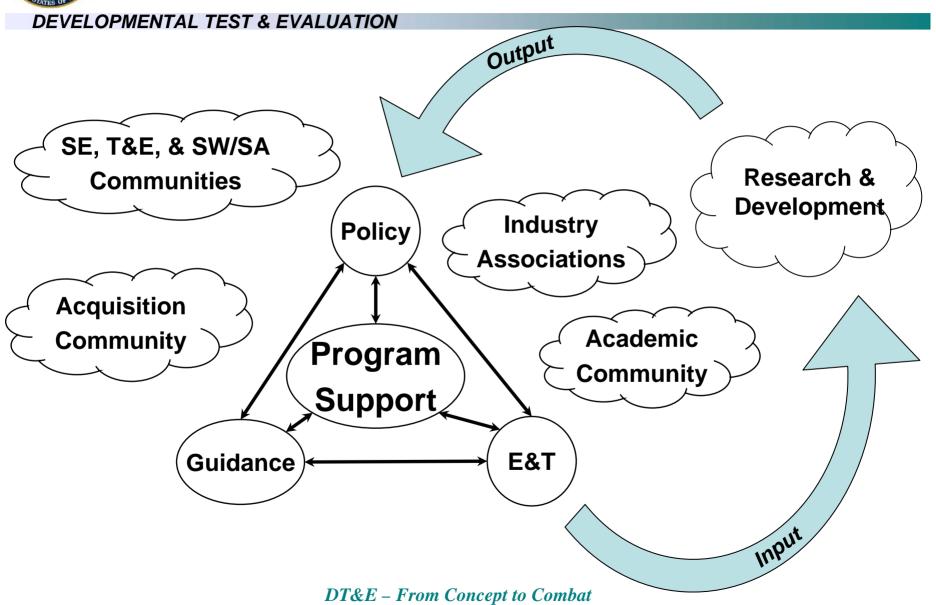
DEVELOPMENTAL TEST & EVALUATION

- Shape acquisition solutions and promote early technical planning
- Promote the application of sound systems and software engineering, developmental test and evaluation, and related technical disciplines across the Department's acquisition community and programs
- Raise awareness of the importance of effective systems engineering and drive the state-of-the-practice into program planning and execution
- Establish policy, guidance, best practices, education, and training in collaboration with academia, industry, and government communities
- Provide technical insight to program managers and leadership to support decision making

Evolving System Engineering Challenges



Systems Engineering Revitalization Cycle





5. Reliability

Top 10 Emerging Systemic Issues

DEVELOPMENTAL TEST & EVALUATION

Inexperienced staff, lack of technical expertise

2. Requirements • Creep/stability

• Tangible, measurable, testable

3. Systems Engineering

• Lack of a rigorous approach, technical expertise

• Process compliance

4. Staffing • Inadequate Government program office staff

Ambitious growth curves, unrealistic requirements

Inadequate "test time" for statistical calculations

6. Acquisition Strategy • Competing budget priorities, schedule-driven

Contracting issues, poor technical assumptions

7. Schedule • Realism, compression

8. Test Planning • Breadth, depth, resources

9. Software • Architecture, design/development discipline

Staffing/skill levels, organizational competency (process)

10. Maintainability/Logistics • Sustainment costs not fully considered (short-sighted)

Supportability considerations traded

Major contributors to poor program performance



DT&E Revitalization Focus

DEVELOPMENTAL TEST & EVALUATION

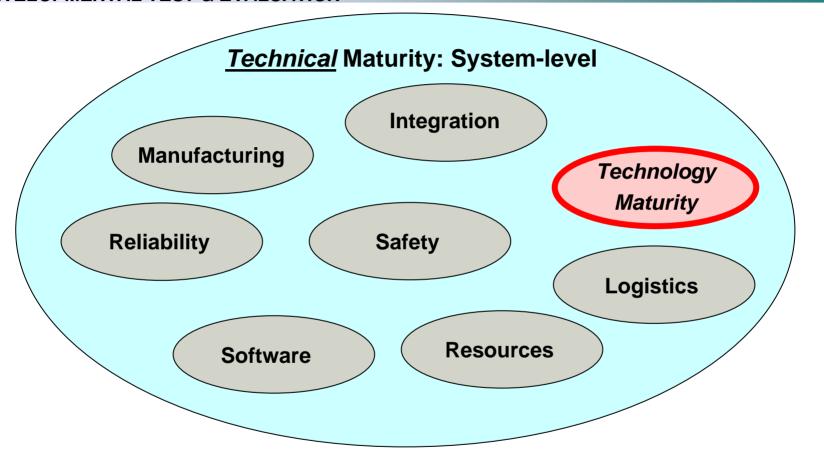
- Support Faster Fielding of Improved Capabilities
- Reduce Risk of Immature Technology in Systems Development
- Revitalize T&E Workforce Education
- Promote Joint T&E in Live-Virtual-Constructive Environments
- Provide Effective Acquisition Policy and Practices for DT&E

DT&E Revitalization Vectors



Technology vs. Technical Maturity

DEVELOPMENTAL TEST & EVALUATION



Technology Maturity is a component- or subsystem-level issue



Reduce Risk of Immature Technology in Systems Development

DEVELOPMENTAL TEST & EVALUATION

Immature technology is a primary source of cost and schedule risk

GAO-- DAPA

QDR -- SSE Program Support Reviews

- "Programs that started development with immature technologies experienced an average acquisition unit cost increase of nearly 21 percent" (GAO-05-301, March 2005)
- Milestone B USD(AT&L) certification that "the technology in the program has been demonstrated in a relevant environment" -Technology Readiness Level (TRL) 6 (FY06, PL 109-163, Section 801)



DT&E Technology Maturity Initiative

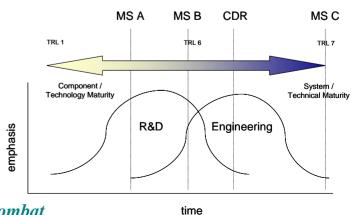
DEVELOPMENTAL TEST & EVALUATION

Purpose

- Add Technology Maturity focus into the Systems Engineering and DT&E processes to:
 - Reduce technical, cost, and schedule risk
 - Increase the rigor of SE
 - Plan for alternatives in the event of TM difficulty
 - Verify TRLs during DT&E

Scope

- Leverage existing acquisition review structure
- Use existing DDR&E Technology Readiness Assessment (TRA) methodology





Pending Guidance Changes

DEVELOPMENTAL TEST & EVALUATION

- Defense Acquisition Guidebook
 - Chapter 4 (SE)
 - For immature critical technology elements (CTE), identify mature alternative
 - If a CTE is not likely to reach TRL 6 before MS B, substitution of the mature alternative may be required
 - Chapter 9 (T&E)
 - Validate technology maturation during Technology Development phase
 - DT supports decisions to shift to alternative technology



Increased TM emphasis in OSD Oversight

DEVELOPMENTAL TEST & EVALUATION

- Program Support Review (PSR)
 - ID Critical Technology Elements?
 - Current TRLs known?
 - ID Mature alternative components/sub-systems?
 - TRL monitoring, Alternative decision date?
- Assessment of Operational Test Readiness (AOTR)
 - TM verification results
 - DT&E performance results
 - IOT&E predictive analysis/M&S

