



Systems and Software Engineering

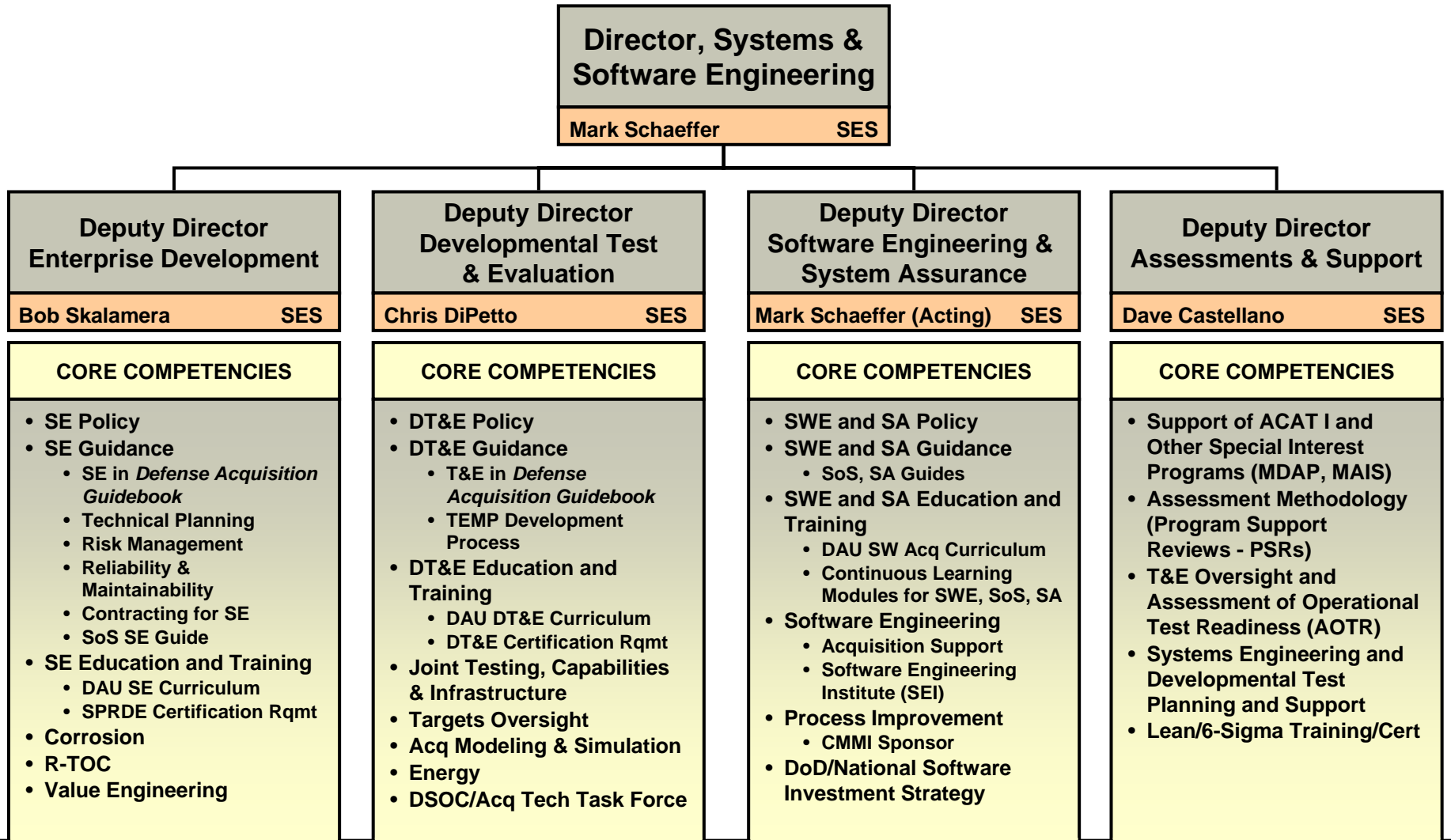
Mark D. Schaeffer

Director, Systems and Software Engineering
Office of the Under Secretary of Defense (A&T)



Systems and Software Engineering

Organizational Core Competencies



Acquisition program excellence through sound systems and software engineering



USD(AT&L) Imperatives

- “Provide a context within which I can make decisions about individual programs.”
- “Achieve credibility and effectiveness in the acquisition and logistics support processes.”
- “Help drive good systems engineering practice back into the way we do business.”

Honorable Michael Wynne, Principal Deputy (USD AT&L), 2002

Still Operative after nearly 4 years



Systems and Software Engineering Mission Statement

- 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

Driving Technical Excellence into Programs!



Driving Technical Rigor Back into Programs “Portfolio Challenge”

- Systems and Software Engineering was tasked to:
 - Review program’s SE Plan (SEP) and T&E Master Plan (TEMP)
 - Conduct program support reviews
- Portfolio of major acquisition (ACAT ID and IAM) programs, supporting 10 Domain Areas:
 - Business Systems
 - Communication Systems
 - C2ISR Systems
 - Fixed Wing Aircraft
 - Unmanned Systems
 - Rotary Wing Aircraft
 - Land Systems
 - Ships
 - Munitions
 - Missiles

***Systems Engineering and T&E Support to Over
150 Major Programs in 10 Domain Areas***



Driving Technical Rigor Back Into Programs “Program Support Reviews”

- Program Support Reviews provide insight into a program’s technical execution focusing on:
 - SE as envisioned in program’s technical planning
 - T&E as captured in verification and validation strategy
 - Risk management—integrated, effective and resourced
 - Milestone exit criteria as captured in Acquisition Decision Memo
 - Acquisition strategy as captured in Acquisition Strategy Report
- Independent, cross-functional view aimed at providing risk-reduction recommendations

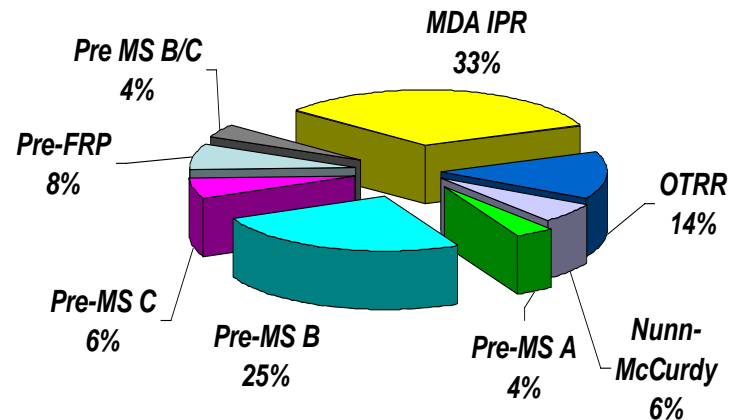
The PSR reduces risk in the technical and programmatic execution on a program



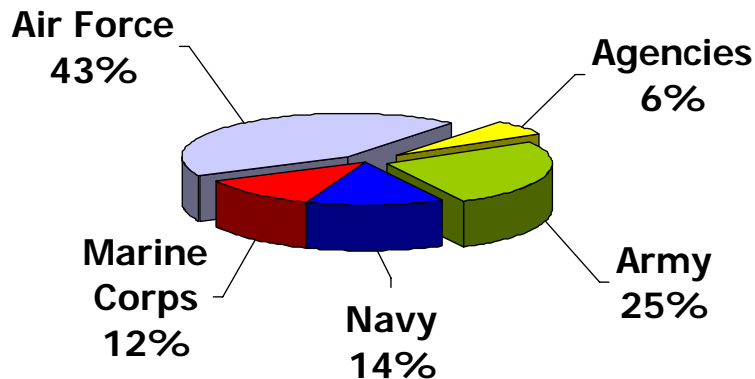
Program Support Review (PSR) Activity (since March 2004)

- PSRs/NARs completed: 34
- AOTRs completed: 7
- Nunn-McCurdy Certification: 3
- Participation on Service-led IRTs: 4
- Technical Reviews: 3
- Reviews planned for rest of FY06
 - PSRs/NARs: 10
 - AOTRs: 4
 - NARs: 2

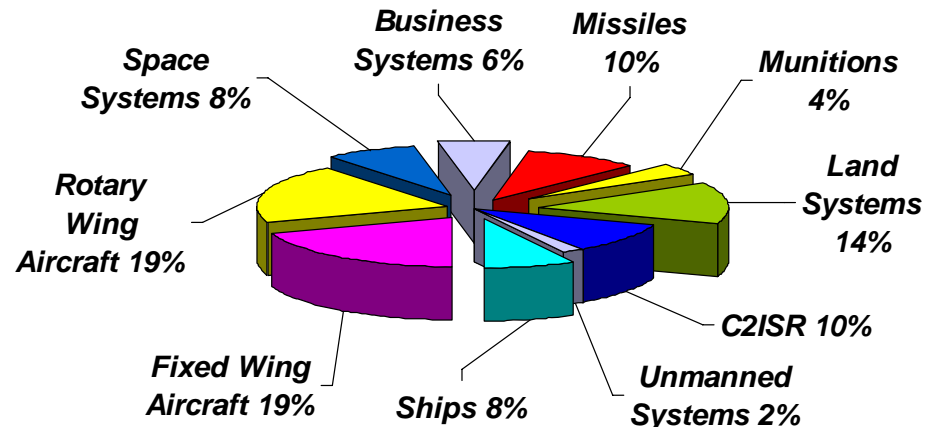
Decision Support Reviews



Service-Managed Acquisitions



Programs by Domain Area





Program Support Reviews

Representative Issues

➤ Mission Capabilities

- Requirements—reasonable, measurable, complete

➤ Resources/Management

- Schedule adequacy—success-oriented vice event-driven; schedule realism
- Risk management—inadequate or not linked to technical effort

➤ Technical Process

- Systems Engineering Planning—inadequate technical planning
- Test & Evaluation—insufficient tests or test articles

➤ Technical Product

- Reliability—insufficient reliability growth program
- Supportability/Maintainability—timing of validation



Why We Do AOTRs

- Mr. Wynne's Goal 3 Objective 10 established assessing System Technical Maturity / Readiness for Operational Testing based on Developmental Test results to:
 - Address Congressional concerns of why programs were not meeting requirements in IOT&E
 - Determine the sufficiency of developmental testing prior to entering IOT&E
- SSE metrics confirm that approximately 55% of DoD programs from FY2001 to FY2005 entered IOT&E and failed to meet Operational Effectiveness or Suitability requirements
- Sample AOTR results to date:
 - V-22 AOTR independently validated the PM's low risk assessment and provided confidence to proceed to OPEVAL
 - H-1 AOTR assessed risk as moderate to high for OPEVAL and recommended the OPEVAL be restructured to mitigate risk



Assessment Objectives

- AOTRs provide an independent risk-based technical performance analysis of the program's current and mitigated risk for IOT&E to assist decision makers
- AOTRs provide actionable risk mitigation recommendations to the PM and OTRR Chair based on:
 - Completed developmental performance
 - Completed operational assessments
 - Interviews with Stakeholder's
 - System and subsystem technical maturity level
 - Material and support readiness
- Results to date have influenced IOT&E/OPEVAL entry for the V-22 Osprey, H-1 Upgrades, F-22 programs

**Analyze programmatic and systemic issues across DoD
to improve system acquisition**