Systems and Software Engineering Overview

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Mark D. Schaeffer

Director, Systems and Software Engineering

Office of the Deputy Under Secretary of Defense (A&T)

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SE Challenges …circa 2003

➢ Lack of Uniform SE Understanding at Department level
- Policy, implementation, incentives, product/process balance, life-cycle focus

➢ Lack of Uniform Understanding of SE in the Community-at-Large
- Scope of SE, understanding of how to implement SE, what makes a good systems engineer, alignment of management and SE processes, multiple standards and models, alignment of practitioner communities

➢ Increasing system complexity
- Integrated systems … higher levels of integration

➢ SE Resources – "We have a pipeline problem"

> ***Our Challenge: Execute the "Big Picture"***

DoD Systems Engineering Response

➢ **USD(AT&L) Imperatives**

- Provide a context for decisions on individual programs
- Achieve credibility and effectiveness in acquisition and logistics support processes
- Help drive good SE practices back in how we do business

➢ **Organizational response: new SE organization**

- Institutionalize SE across the Department
- Set implementation policy, capture best practices, standards for Education and Training
- Emphasis on system assessment and support

What We Have Done To Revitalize Systems Engineering 2003 - Today

➢ Issued DoD-wide SE policy – focused effort on up front, sound technical planning; issued safety policy

➢ Issued guidance on Systems Engineering, test and evaluation (T&E), software, and safety

➢ Worked with Defense Acquisition University to revise Systems Engineering curricula -- currently revising T&E and enabling career fields curricula

and Software

➢ Established Systems Engineering Forum—senior-level focus within DoD

➢ Integrated development testing, software/system assurance, system of systems, and open systems into revitalization efforts

➢ Instituting a renewed emphasis on modeling and simulation

➢ Leveraging closer working relationships with industry and academia

➢ Instituting system-level assessments in support of OSD major acquisition program oversight role

System Engineering Revitalization Effort

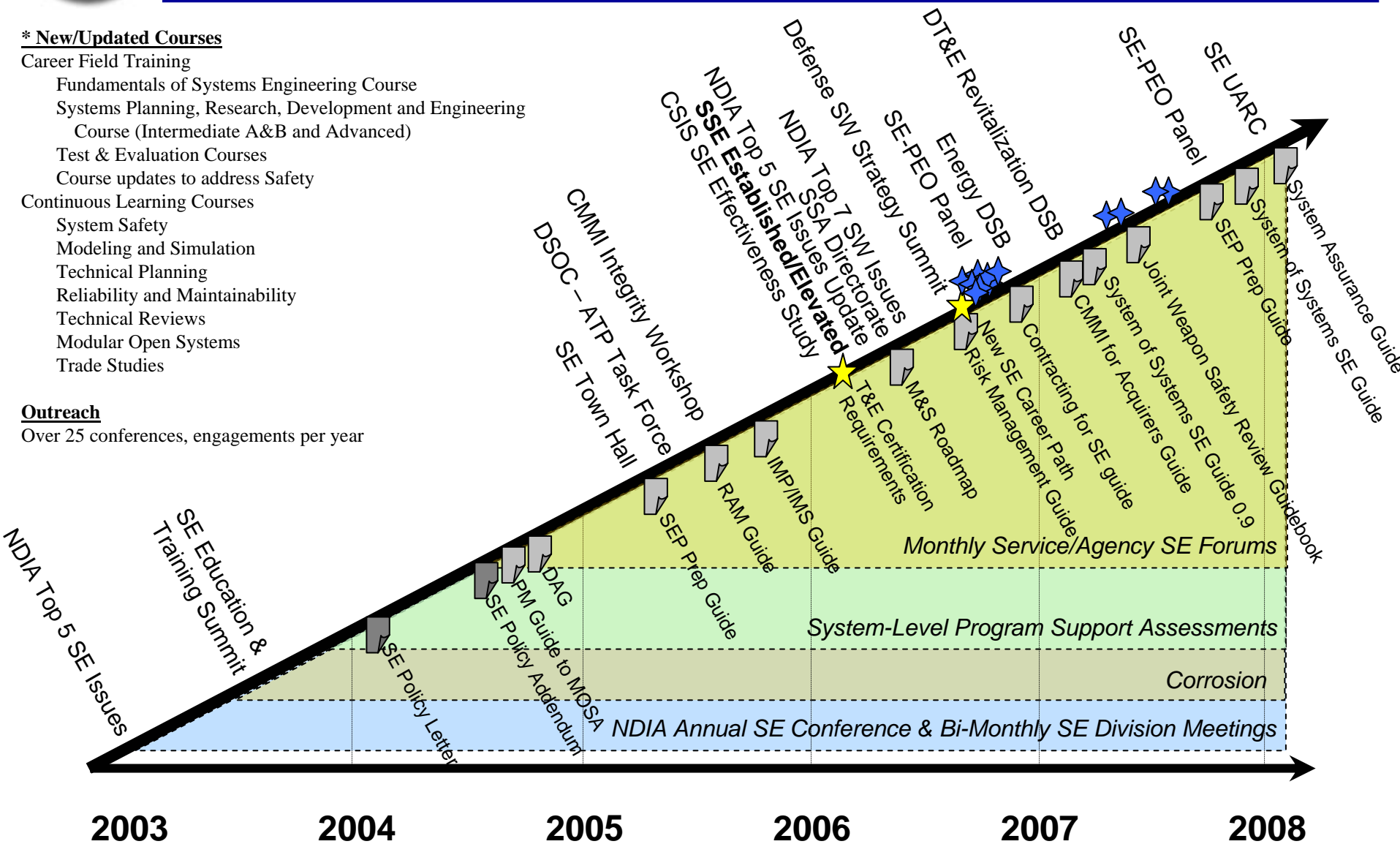*** New/Updated Courses**
Career Field Training
    Fundamentals of Systems Engineering Course
    Systems Planning, Research, Development and Engineering
       Course (Intermediate A&B and Advanced)
    Test & Evaluation Courses
    Course updates to address Safety
Continuous Learning Courses
    System Safety
    Modeling and Simulation
    Technical Planning
    Reliability and Maintainability
    Technical Reviews
    Modular Open Systems
    Trade Studies

Outreach
Over 25 conferences, engagements per year

Timeline labels:
- NDIA Top 5 SE Issues
- SE Education & Training Summit
- SE Policy Letter
- SSE Policy Addendum
- IPM Guide to MOSA
- DAG
- DSOC – ATP Task Force
- CMMI Integrity Workshop
- SE Town Hall
- SEP Prep Guide
- RAM Guide
- IMP/IMS Guide
- NDIA Top 5 SE Issues
- SSA Directorate
- NDIA Top 7 SW Issues
- SSE Issues Update
- CSIS SE Effectiveness Study
- **SSE Established/Elevated**
- Defense SW Strategy Summit
- T&E Certification Requirements
- M&S Roadmap
- SE-PEO Panel
- Energy DSB
- New SE Career Path
- Risk Management Guide
- DT&E Revitalization DSB
- Contracting for SE guide
- CMMI for Acquirers Guide
- System of Systems SE guide
- SE-PEO Panel
- Joint Weapon Safety Review Guidebook
- System of Systems SE Guide 0.9
- SE UARC
- SEP Prep Guide
- System of Systems SE Guide
- System Assurance Guide

Shaded bands:
- Monthly Service/Agency SE Forums
- System-Level Program Support Assessments
- Corrosion
- NDIA Annual SE Conference & Bi-Monthly SE Division Meetings

2003   2004   2005   2006   2007   2008

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Current State of DoD Systems Engineering

➢ We have revitalized Systems Engineering Policy, Guidance, Education and Training…

➢ We have driven good systems engineering practices back into the way the acquisition community does business, and have had a positive impact on programs…

➢ We have expanded the boundaries to include increasingly important enablers for sound SE application…

➢ We have a rigorous process to capture what went wrong...

➢ …**but failed to change,** root cause behavior that leads to programs that do not meet cost, schedule, and performance expectations…adequate maturity at program initiation

Much Accomplished – Much to Do!