NDIA 11th Systems Engineering Conference
Executive Panel

Kristen Baldwin
Deputy Director, Software Engineering and System Assurance (SSA)
Office of the Deputy Under Secretary of Defense
(Acquisition and Technology)

October 21, 2008
SSE Way Forward

★ Reality, and opportunity

★ OSD SSE Strategy
  ☆ Enhanced SE Pre-MS A/B
  ☆ Human capital strategy for SE
  ☆ SE research

★ Key SSE Improvement Areas
Reality and the Opportunity

- Acquisition cost growth over 11 years*
  - Estimation changes: $201B
  - Engineering changes: $147B
  - Schedule changes: $70B

*SAR data FY 1995–2005

With 72% of O&S costs established pre-Milestone A, Systems Engineering plays a critical role ensuring capabilities are translated into executable requirements and feasible programs.

FY 2008 Defense Budget
Total Obligational Authority ($ in billions)*

OSD SE Strategy

NRC Study Recommendations

- Treat Milestones A/B as critical; ensure completion
- Deliver needed # of trained SEs
- Perform pre-MS A analysis; include stakeholders
- Implement Component development planning

Systemic Analysis Recommendations*

- Implement Achievable Acquisition Strategy and Planning
- Enhance Gate Review Decision Process
- Enhance Staff Capabilities

*Based on 3700 Program Assessment findings from 40 Programs Support Reviews

Enhanced SE Pre-MS B

Advancing the State of SE through Research

SE Human Capital Strategy
**Policy and Guidance Updates**
- DoD 5000 update
- Acquisition Guidance Model
- Early SE engagement with programs
- Program Support Reviews (PSRs) Pre-MS A/B
- Risk Reduction activities (e.g. Technical Risk assessment in AoAs, Competitive Prototyping)
- SE Technical Reviews - Informed Trades for Feasible Solutions

**Developmental Test & Evaluation**
- Integrated DT/OT
- Updated T&E Strategy at MS A
Improve Knowledge through Technical Foundation

Systems Engineering is effective when it informs, and is informed by, other Acquisition process owners.
SE Human Capital Strategy

★ SE core competency assessment effort; completion - Spring 2009
★ Program Systems Engineer career path
★ FY08 NDAA Section 852: DoD Acquisition Workforce Development Fund - $300M per year across DoD
  ☆ SE and T&E initiatives to recruit, retain and train the workforce
★ DoD Human Capital Initiative - Published Annex for SPRDE, PQM and T&E
★ Partnership with INCOSE SE Certification Program
  ☆ Aligned with Defense Acquisition Guidance
★ Software Engineering (SwE) Human Capital Initiatives
  ☆ DoD Acquisition Workforce SwE Competencies
  ☆ Graduate SwE reference curriculum
Systems Engineering Research

- **Awarded SE Research UARC**
  - University Affiliated Research Center (UARC)
  - Led by Stevens Institute of Technology and its principal partner, University of Southern California
- **SSE and NSA UARC Funds**
  - Lead, coordinate, and harmonize SE research
  - Improve SE methods, processes, and tools (MPTs) in support of DoD challenges
- **Opportunity for DoD and Industry investment**
  - Advance the state of Systems Engineering
  - Nurture and grow graduate-level systems engineering academic and research programs
Key OSD SE Improvement Areas

Transcending DoD Acquisition

- System/Software Engineering Integration
  - Framework to highlight key process, workforce, and tools to recognize key role software plays in our systems

- Systems of Systems Engineering
  - *DoD SoS SE Guide* defines core elements of SoS SE, application of SE processes, and emerging principals

- Manufacturing and Reliability
  - OSD and Component implementation of reliability best practices, throughout the lifecycle – July 08 Policy Memo
  - Assessing Manufacturing Risk & Readiness at key decision points

- System Assurance and Program Protection
  - *NDIA Engineering for Assurance Guidebook* integrates security into Systems Engineering to focus on protecting our programs from malicious tampering and network threats
Always Our Focus

The Mission:
Delivering Timely and Affordable Capabilities to the Warfighter

The Defense Acquisition Community
126,033 Government and Military Certified Professionals
500,000+ Defense Industry Personnel
### Tuesday, October 21, 2008

#### Session C - 1:30-3:15pm

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<tr>
<th>Track 1 SE Effectiveness – Bayview III</th>
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<tr>
<td>7099 DoD’s Systems and Software Engineering Revitalization Efforts—An Update, Nicholas (Nic) Torelli</td>
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<td>7153 Systems Engineering Plan (SEP) and Systems Engineering Management Plan (SEMP) Unification, Chet Bracuto</td>
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<th>Track 2 T&amp;E in SE – Bayview II</th>
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<td>7100 Implementation of the 2007 Developmental Test &amp; Evaluation Defense Science Board Results, Chris DiPetto</td>
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<td>7101 Test and Evaluation Value Metrics at Acquisition Decision Points, Darlene Mosser-Kerner</td>
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<td>7096 New Acquisition Policy and Its Impact on Defense Systems Engineering, Sharon Vannucci</td>
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<th>Track 5 M&amp;S – Mission II</th>
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<td>7172 Execution of the Acquisition M&amp;S Master Plan - A Progress Report, James Hollenbach &amp; Michael Truelove</td>
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<th>Track 8 Software – Palm II</th>
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<td>7137 DoD Software Engineering and System Assurance, Kristen Baldwin</td>
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### Session D - 3:30-5:15pm

**Track 1 SE Effectiveness – Bayview III**
- 6986 Technology Readiness Assessments for Systems of Systems, Dr. Jay Mandelbaum

**Track 2 T&E in SE – Bayview II**
- 7103 New Test and Evaluation Master Plan Guidance, Darlene Mosser-Kerner
- 6996 Modeling & Simulation in the Test & Evaluation Master Plan, Michael Truelove

**Track 5 M&S – Mission II**
- 7175 LVC Architecture Roadmap - A Path Forward for Distributed Simulation, James Hollenbach

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For More Information: Tues Afternoon 2

Tuesday, October 21, 2008
For More Information: Wed Morning

Wednesday, October 22, 2008

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<td>7438 The Incremental Commitment Model and Competitive Prototyping, Dr. Barry Boehm</td>
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<td><strong>Track 4 Program Management – Mission I</strong></td>
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<td>7721 Systemic Analysis and Developing System Issues, Peter Nolte</td>
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<td>7720 Systemic Root Cause Task Group Results, Dave Castellano</td>
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<td>Systemic Root Cause Task Group Recommendations Implementation, Nicholas Torelli</td>
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<td>7114 Building the Next Generation of Software Engineers – Benchmarking Graduate Education, Dr. Art Pyster</td>
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<td>7135 Improving Work Breakdown Structure (WBS) Guidance for Weapons Systems with Substantial Software Content, Christopher Miller</td>
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<th>Session B – 10:15am-Noon</th>
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<td>7436 A Process Decision Table for Integrated Systems and Software Engineering, Dr. Barry Boehm</td>
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<td>6888 Value Engineering: Enhance DMSMS Solutions, Dr. Jay Mandelbaum</td>
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<td>7761 Applying Business Process Modeling to Develop Systems Engineering Guidance for New DoD Acquisition Regulations, Dr. Judith Dahmann</td>
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<td>7344 Complex System Development Program Assessments and Support: A Forensics Perspective, Dr. Dinesh Verma</td>
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<td>7204 Advancing Systems Engineering Practice within the Department of Defense: Overview of DoD’s Newest University Affiliated Research Center (UARC), Sharon Vannucci &amp; Dennis Barnabe</td>
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<td>7174 Virtual Battlespace Center for Systems Engineering, James Hollenbach</td>
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**Thursday, October 23, 2008**

**Session A - 8-9:45 am**

**Track 1 SE Effectiveness – Bayview III**
- 7697 Enhancing Systems Engineering in the Department of Defense, Ceasar Sharper

**Track 2 Best Practices & Standardization – Bayview II**
- 7179 Integration of Systems and Software Engineering: Implications from Standards and Models Applied to DoDs’ Acquisition Programs, Donald Gantzer

**Session B - 10:15am-Noon**

**Track 5 Education & Training – Mission II**
- 7094 Development and Validation of a Systems Engineering Competency Model, Dr. Don Gelosh
Systems Engineering is effective when it informs, and is informed by, other Acquisition process owners.