

Systems Engineering Division

An overview for the Integrated
Program Management Division

Frank Serna
SE Division Chair
26 August

Overview

- The Division – mission, organization, processes
- Ongoing activities, recent events & products
- Awards
- The SE conference
- Closing remarks

NDIA

Systems Engineering Division

Systems Engineering Division

Mission:

To promote the widespread use of systems engineering (SE) in the Department of Defense (DoD) acquisition process in order to achieve affordable and supportable weapon systems that meet the needs of the military users. To provide a forum for the open exchange of ideas and concepts between government, industry and academia. To develop a new understanding of a streamlined SE process.

The SE Division seeks to effect good technical and business practices within the aerospace and defense industry. It focuses on improving delivered system performance, including supportability, sustainability, and affordability. The division emphasizes excellence in systems engineering throughout the program life cycle and across all engineering disciplines and support functions.

<http://www.ndia.org/Divisions/Divisions/SystemsEngineering/>

- Mission:
 - Promote effective systems engineering in government and industry to achieve affordable and supportable systems
- Organization:
 - One of the largest and most active NDIA division
 - Partnered with DASD(SE)
 - 15 committees, plus assigned task/working groups
- Key Initiatives Include:
 - Pre-MS A SE (Development Planning)
 - Systems engineering effectiveness
 - System development performance measures
 - CMMI (former Industry Sponsor)
 - System assurance (secure systems engineering)
 - System of systems (SoS) engineering
 - Modeling and Simulation
 - Development Test & Evaluation (DT&E)
 - Education & training
 - SE standards for acquisition
 - SE workshops, studies, reports
 - Host of NDIA Systems Engineering conference

SE Division Mission

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National Defense Industrial Association SYSTEMSENGINEERING DIVISION

25 August 15 R1

Steering Committee

Div Chairs (Exec Com) plus:

Pete Larkin – GD, Electric Boat
 Craig Miller – Harris
 Garry Roedler – Lockheed Martin
 Mark Schaeffer – ManTech Int'l
 Chris Orłowski – Northrop Grumman
 Gary Motchan – Boeing
 John Gill – BAE Systems
 (open) – SAIC
 (open) – United Technologies
 (open) – Raytheon
 (open) – Sikorsky
 Angela Wallace – Booz Allen Hamilton

CHAIR

Frank Serna
 Draper Laboratory

VICE-CHAIRS:

Joe Elm
 L-3Com

Chair Emeritus

Bob Rassa
 Raytheon

Sr Gov't Participation

Steve Welby – DASD(SE)
 Kevin Fahey – US Army
 Dale Sisson – US Navy
 Jeffrey Stanley – USAF
 Jack Zavin – ODASD C3/Cyber

Affiliate Groups

Gery Mras – AIA
 Dr. Eric Honour – INCOSE
 Paul Croll – IEEE Computer Society
 Bob Rassa – IEEE AESS
 Les Orłidge – IEEE SCC20
 George Rebovich – MITRE
 Dr. Ken Nidiffer – SEI
 (open) – Aerospace

CMMI WG

Dan Blazer, Leidos
 Geoff Draper, Harris
 Bob Rassa, Raytheon

System-of Systems Cmte

Rick Poel, Boeing
 Dr. Judith Dahmann, MITRE
 Jeff Wolske, Raytheon

Human Systems Int Cmte

Matthew Risser, Pacific S&E
 Patrick Fly, Boeing

Agile and SEWG

Mary Ann Lapham, SEI
 Linda Maness, Harris

Automatic Test Committee

Les Orłidge, Consultant
 Randy Farwell, Northrop Grumman
 Howard Savage, SCI

Development Test & Evaluation Committee

Joe Manas, Raytheon
 Steve Scukanec, Northrop Grumman

ESOH Committee

David Schulte, SAIC
 Sherman Forbes, USAF

Systems Engineering Effectiveness Committee

Joe Elm
 L-3Com
 John Gill
 BAE

Education & Training Committee

Dr. John Snoderly
 Defense Acquisition University
 Dr. Don Gelosh
 Worcester Polytechnic Institute
 Dr. Ken Nidiffer
 SEI

Software Committee

Paul Croll
 IEEE
 Dr. Ken Nidiffer
 SEI

Modeling & Simulation Committee

Jeff Bergenthal
 Johns Hopkins APL
 Dr. Jim Coolahan
 Coolahan Associates

Enterprise Health Management Committee

Howard Savage
 SCI
 Chris Reisig
 Boeing (St Louis)

Systems Security Engineering Committee

Holly Dunlap
 Raytheon
 Melinda Reed
 ODASD(SE)
 Mitch Komaroff
 DoD CIO

Architecture Committee

Curtis Potterveld
 Boeing
 Dr. Steve Dam
 Spec Innovations

- Division meetings
 - Bi-monthly meetings (open to all) convene the day after the DASD(SE) Systems Engineering Forum – Feb, Apr, Jun, Aug
 - The committees and working groups meet at least bi-monthly
 - Workshops are held on critical topics each year
- Major events
 - 18th Annual Systems Engineering Conference October 26-29, 2015, Waterford, Springfield VA
 - SE Division Annual Planning meeting convenes in December of each year

ONGOING ACTIVITIES & RECENT PRODUCTS

Ongoing Activities

- Each of the twelve committees and multiple working groups are pursuing critical topics that emerge from
 - DASD(SE) and Service chief engineers future plans, e.g., update to standards
 - Industry concerns
- Examples

Committee or Working Group	Topic
Agile and Systems Engineering	Developing a perspective on agile methods for SE
Architecture	Impacts of DOD organization changes on DODAF, MBSE, and JIE
Systems Security Engineering	Resilient & Trusted Cyber Systems Security Metrics & Measures Framework

- Mapping Standards for Integrated Development
- Recommendations for Software Initiatives
- Digital System Model Workshop



Recommendations for Software Initiatives

NDIA Systems Engineering Division
Software Committee

Presented to:
Ms. Kristen J. Baldwin
Principal Deputy
Office of the Deputy Assistant Secretary of
Defense for Systems Engineering
20 April 2015



Mapping Standards for Integrated Development

Mapping Standards for Integrated Development

NDIA Systems Engineering Division
AIA Engineering Management Council

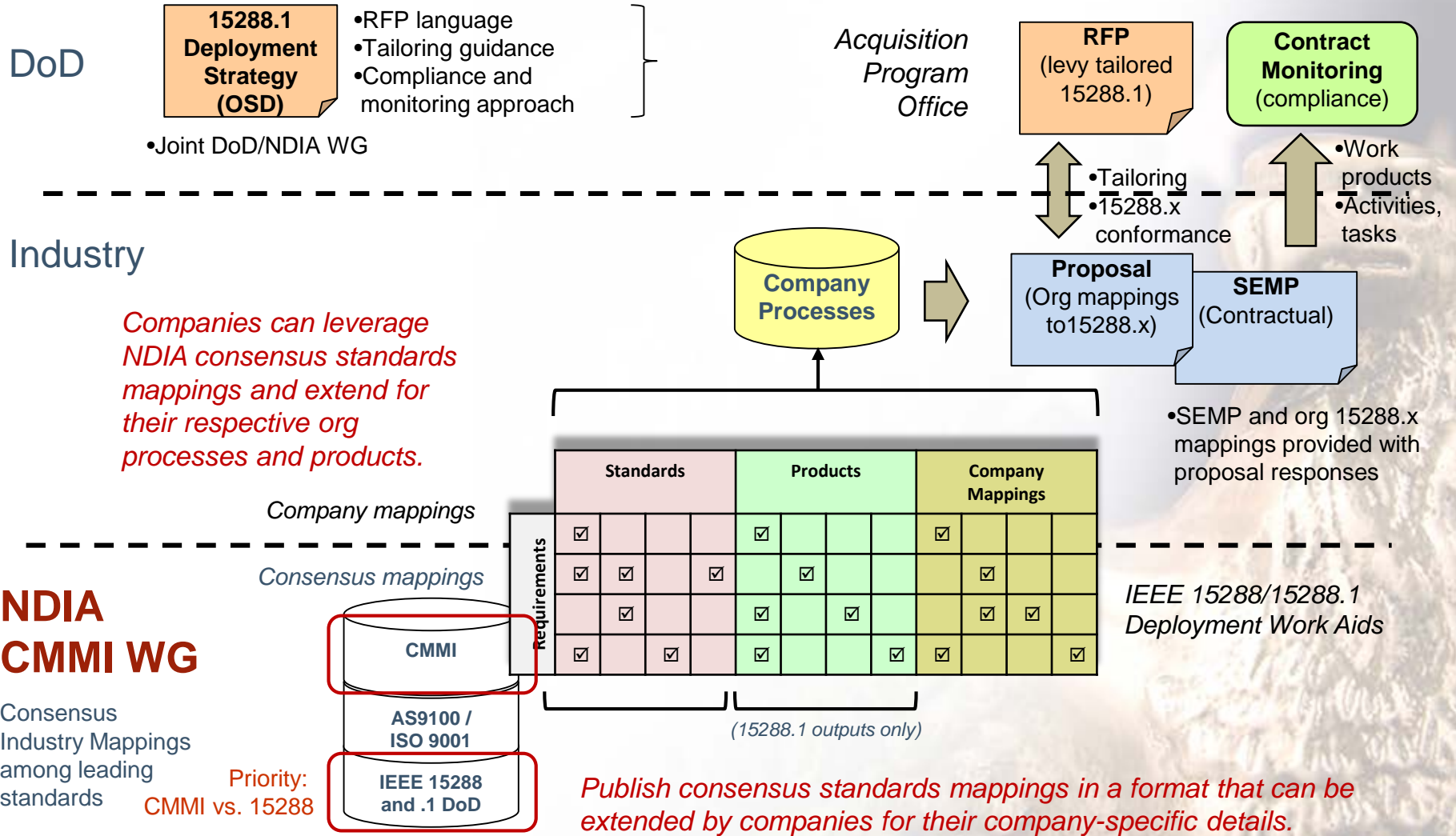
NDIA CMMI[®] Working Group
Standards Mapping Team

Version 0.7

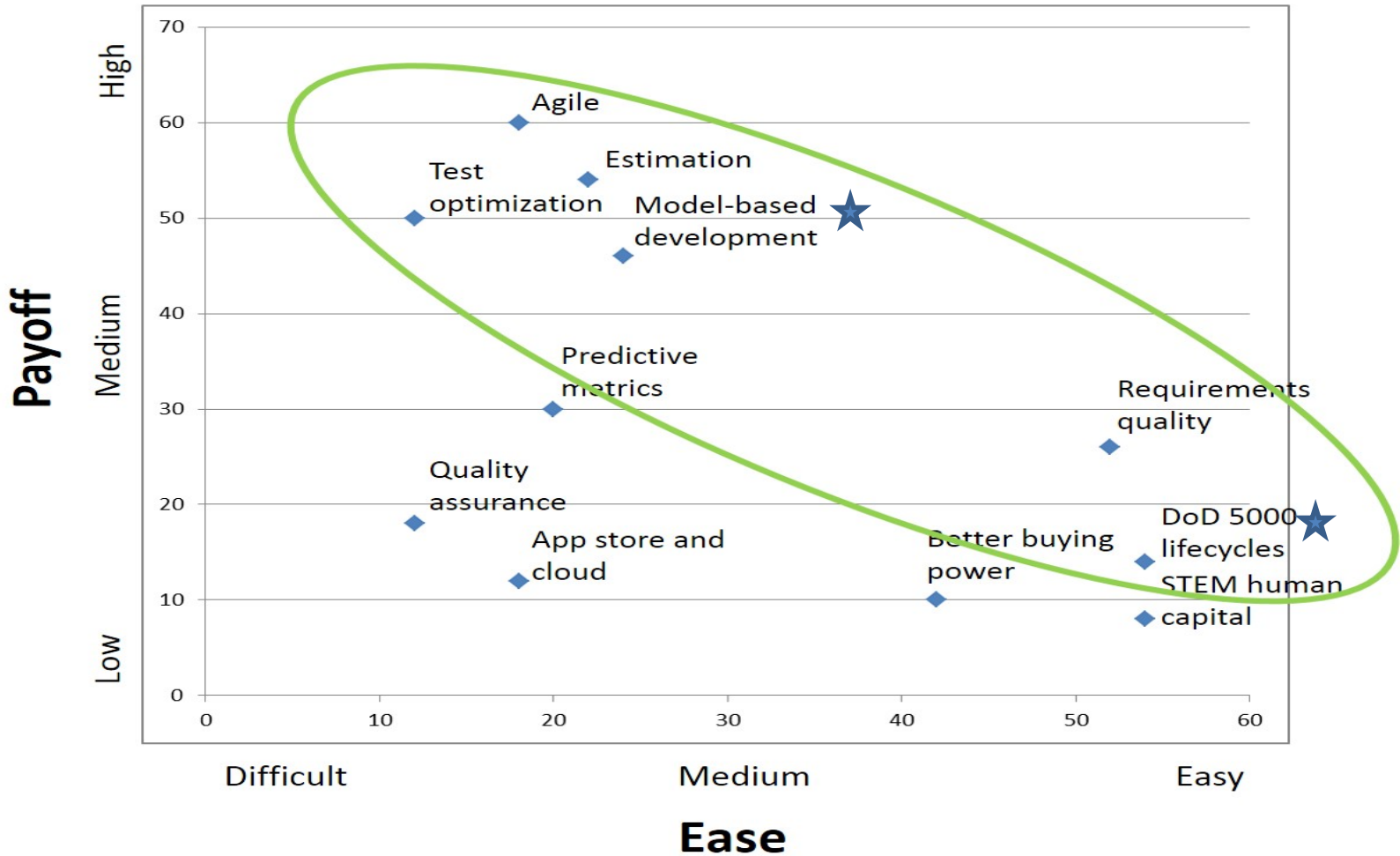
August 1, 2015

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Conops - IEEE 15288.1 Deployment Strategy and Integrated Standards Mappings in Acquisition



Recommendations for Software Initiatives



Digital System Model Workshop 17-18 Aug 2015 - Objectives

- To define/refine the principal uses of the Digital System Model in the acquisition of systems – from concept to disposal – to aid in ensuring its usefulness and completeness
- To obtain Systems Engineering community input (particularly from Industry) on the critical contents of the Digital System Model
- To obtain community input on the issues associated with the implementation of the Digital System Model across the acquisition lifecycle and between the Government and Industry
- To assess the degree to which the Digital System Model is consistent with the larger goal of Model-Based (Systems) Engineering, to aid in determining if there are gaps in the Digital System Model concept.

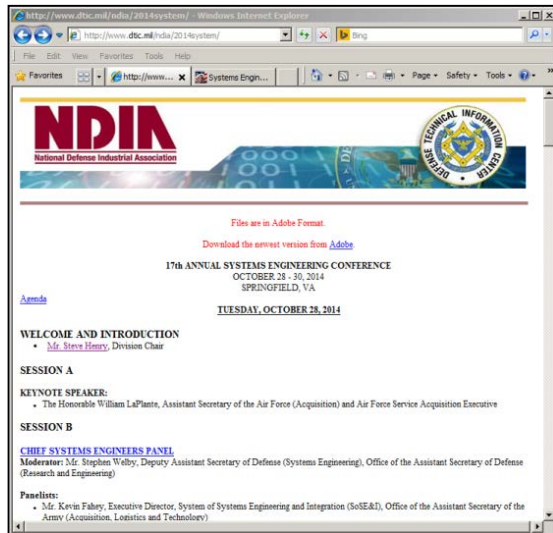
Lt Gen Thomas R. Ferguson Award

The award is given to an individual and to a group demonstrating outstanding achievement in the practical application of Systems Engineering principles, promotion of robust systems engineering principles throughout the organization, or effective systems engineering process development. Their systems engineering contributions should have demonstrably helped achieve significant cost savings due to new or enhanced processes procedures and/or concepts, increased mission capabilities, or substantially increased performance.

- Awarded annually to one individual and one group at the SE conference
- Nominations for 2015 were due 31 July
- We received seven individual nominations and six group nominations

THE ANNUAL SE CONFERENCE

NDIA SE Conference: 28-30 Oct 2014, Springfield VA



•DoD Keynotes

- Hon. William LaPlante, *Ass't Secretary of the Air Force (Acquisition) and Air Force Service Acquisition Executive*
- Mr. Stephen Welby, *Deputy Assistant Secretary of Defense, Systems Engineering*

•Executive Panels

- Government Chief Systems Engineers
- Government Program Managers
- Industry Systems Engineering Executives

•Presentation Tracks (6 concurrent)

- Secure Systems Engrg SE Effectiveness
- Engr'd Resilient Systems Modeling & Simulation
- Agile and SE Net Centric/Interoperability
- Dev Test & Evaluation Affordability
- ESOH DoD Standards
- HSI Architecture
- System of Systems Education & Training

Proceedings: <http://www.dtic.mil/ndia/2014system/>

DASD (SE) Briefings

NDIA SE Conference Oct 2014

•What is DoD saying about systems engineering?

•Briefings by the Office of Deputy Ass't Sec'y of Defense, DASD Systems Engineering

•<http://www.acq.osd.mil/se/outreach/briefs.html#ndiasec2014>

[SoS Considerations in the Engineering of Systems](#)

Kristen Baldwin, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 30, 2014

[DASD\(SE\) Reliability and Maintainability Engineering Initiatives](#)

Andrew Monje, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 30, 2014

[Digital System Model Development and Technical Data](#)

Philomena Zimmerman, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 30, 2014

[Transitioning Systems Engineering Research into Programs and Practice](#)

D. Scott Lucero, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 30, 2014

[Developing the US Department of Defense Engineering Workforce](#)

Aileen Sedmak, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 30, 2014

[DoD Engineering and Better Buying Power 3.0](#)

Stephen P. Welby, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

[US Department of Defense Systems Engineering Policy and Guidance](#)

Aileen Sedmak, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

[Modular Open Systems Architecture in DoD Acquisition](#)

Stephen Welby, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

[Department of Defense \(DoD\) Joint Federated Assurance Center \(JFAC\) Overview](#)

Kristen Baldwin, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

[DoD Software Assurance \(SwA\) Overview](#)

Thomas Hurt, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

[System Security Engineering and Program Protection Integration into SE](#)

Melinda Reed, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

[Vulnerability Analysis Techniques to Support Trusted Systems and Networks \(TSN\) Analysis](#)

Melinda Reed, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

[Department of Defense \(DoD\) Trusted Microelectronics](#)

Raymond Shanahan, 17th Annual NDIA Systems Engineering Conference, Springfield, VA, October 29, 2014

Track Sessions – Synopsis (1)

Track	Example representative topics/presentations
System Security Engineering	Trusted systems. Software assurance. Cyber security. Program protection. Integration w/ SE. Joint Federated Assurance Center (JFAC).
Engineered Resilient Systems [intro]	Complexity, adaptability, rapid reconfiguration. LCC. S&T insertion. Open architectures. High perf computing. Infrastructure frameworks. Tradespace. ERS roadmap.
SE Effectiveness	DoD enterprise initiatives. Standards, policy. SE streamlining. SE business case. Design to cost. Trades. Requirements. SE tools. Architectures. Acquisition agility.
Modeling & Simulation	MBSE. Digital system model. M&S data and tools.
Architecture	Concepts, frameworks. Open systems. Product lines. Architecture analysis. Enterprise architectures.
Affordability	Affordability analysis. Value engineering. TOC.

Proceedings: <http://www.dtic.mil/ndia/2014system/2014system.html>

Track Sessions – Synopsis (2)

Track	Example representative topics/presentations
Developmental Test & Evaluation	Testing in practice: planning, SoS, agile, automation. Chief Developmental Tester. “Testing to the left.”
Interoperability	Net centric operations. Interoperability policy/process.
Agile	Agile in practice: DoD, SE, R&D, affordability, process. Life cycle model development.
Education & Training	SE workforce competencies. Accelerating technical leadership. DoD workforce development.
Human Systems Integration (HSI)	HSI and SE. Frameworks. Collaborative work environments. HSI assessment methodology.
System of Systems (SoS)	SoS engineering, considerations. Applications to SE. Analysis, tools. Virtual environments.
ESOH	Safety engrg, planning. ESOH and SE. MIL-STD-882e.

Proceedings: <http://www.dtic.mil/ndia/2014system/2014system.html>

SESSION TOPICS

- ▶ Architecture
- ▶ Agile
- ▶ DoD Standards and HSI
- ▶ DT&E
- ▶ Engineered Resilient Systems
- ▶ E&T
- ▶ ESOH
- ▶ HSI
- ▶ Joint Architecture & Systems Engineering Effectiveness
- ▶ Joint DT&E, M&S, & NCO/Interoperability
- ▶ Joint Systems Engineering Effectiveness & M&S - Building the System Model
- ▶ Modeling & Simulation
- ▶ Net-Centric Operations/Interoperability
- ▶ SoS - Engineering Approaches for SoS
- ▶ SoS - Applications of SoS SE
- ▶ SoS - Tools and Approaches to SoS Engineering and Analysis
- ▶ Systems Engineering Effectiveness
- ▶ Systems Security Engineering (SSE)

17th ANNUAL SYSTEMS ENGINEERING CONFERENCE



OCTOBER 28-30, 2014

WWW.NDIA.ORG/MEETINGS/5870

WATERFORD ▶ SPRINGFIELD, VA

EVENT #5870

Questions? More info? <http://www.dtic.mil/ndia/2014system/2014system.html>

Closing remarks

- The SE division exists to promote excellence in Systems Engineering for government programs
- Through committees and working groups – with Industry, Academic and Government participation – we develop critical information to
 - Advance Systems Engineering practices & knowledge
 - Inform policy decisions