

## NDIA Systems Engineering Division Annual Planning Meeting

Date/Time: 05-Dec-2019 / 0800  
Location: Lockheed Martin Global Vision Center  
2121 Crystal Drive; Arlington, VA

### 1. WELCOME AND INTRODUCTIONS - JOE ELM

#### 1.1. Attendees

Backhaus, Jon	Lockheed Martin	Manas, Joe	Raytheon
Baltuskonis, Denise	OUSE(R&E)	Moshinsky, Ed	Lockheed Martin
Boleng, Jeff	OUSD(A&S)	Niemann, Greg	Lockheed Martin
Beacham, Annette	OUSD(R&E)	Ocker, Cory	Raytheon
Chesebrough, Dave	NDIA	Pineda, Marilyn	Lockheed Martin
Crim, David	OUSD(A&S)	Ratcliff, Matthew	SAF/AQR
Daly, John	Booz Allen Hamilton	Risser, Matt (phone)	Pac Sci
Doctor, Michael	DASN (RDT&E) SE	Roedler, Garry	Lockheed Martin
Draper, Geoff	L3Harris	Rosenbluth, Gene	Northrop Grumman
Elm, Joseph	Elm System Solutions	Schreiber, Chris	Lockheed Martin
Forbes, Sherman	SAF/AQRE	Shortell, Thomas	Lockheed Martin
Gelosh, Don	WPI	Stanley, Jeff	SAF/AQR
Gill, Karen	Booz Allen Hamilton	Thelin, Steve	Raytheon
Griffin, Pat	Clear-Com	Thompson, Jim	Retired
Henry, Steve	DAU		

### 2. JEFF STANLEY - USAF DEPUTY ASSISTANT SEC'Y (ST&E)

#### 2.1. Outreach to Defense industrial base

- 2.1.1. Expand partnerships with commercial industry and research organizations
- 2.1.2. New MOU with UK on deeper levels of R&D
- 2.1.3. Must operate faster and with agility

#### 2.2. USAF holds "Pitch Days"

- 2.2.1. Companies pitch ideas; USAF awards (small) contracts on the spot
- 2.2.2. Dr. Roper wants "pitch day for DE"
  - 2.2.2.1. Based on USAF-defined use cases
    - 2.2.2.1.1. e.g. re-engineer A10 part no longer available in supply chain
- 2.2.3. Could tie in to SE Division, SE Conference (separate to avoid)
- 2.2.4. Often revolve around SB
  - 2.2.4.1. SB often fails to transition to DIB supply chain
- 2.2.5. Want to try to engage larger suppliers and partner with NDIA for DE-based event
  - 2.2.5.1. NDIA can provide help with use cases
  - 2.2.5.2. Timeframe: now (at least in 2020), maybe at SE Conference

- 2.2.5.3. Could be cooperative event across services: NDIA provides industry support, USAF provide Gov support
- 2.2.5.3.1. Bill Bray = Navy counterpart to Jeff Stanley
- 2.2.5.4. Engage NDIA Mfg. Division and T&E Division to tie in digital manufacturing and test

**2.2.6.ACTION: Coordinate NDIA Pitch Day for DE with Matt Ratcliff after Stanley retirement (end of year)**

- 2.3. Desire to insert MBSE in all AF contracts
  - 2.3.1. M&S committee will engage and support
  - 2.3.2. engage with IPM Division to ensure business case support

### **3. TOM SIMMS - OSD RESEARCH AND TECHNOLOGY**

- 3.1. Acting Director, Eng'g Policy and Systems (OSD R&E Advance Capabilities)
- 3.2. 2020 Modernization Priorities
  - 3.2.1. 5G
  - 3.2.2. Autonomy
  - 3.2.3. Biotechnology
  - 3.2.4. Cyber
  - 3.2.5. directed energy
  - 3.2.6. fully networked C3
  - 3.2.7. hypersonics
  - 3.2.8. ML/AI
  - 3.2.9. Microelectronics
  - 3.2.10. quantum science
  - 3.2.11. space
- 3.3. Objectives
  - 3.3.1. Balance Priorities
    - 3.3.1.1. ITRAs
    - 3.3.1.2. ME Support
  - 3.3.2. Engineering Policy and Implementation
    - 3.3.2.1. DoDI 5000.02 rewrite (acquisition pathways (rapid prototyping, software, ...))
    - 3.3.2.2. Collaborate with A&S and Services to share technical innovations and BP across programs
    - 3.3.2.3. SW engineering
  - 3.3.3. Increase working-level exchanges between industry and govt
    - 3.3.3.1. Establish Eng'g Technical Fellows Program
- 3.4. Policy

- 3.4.1. Update policies
  - 3.4.1.1. Clearly define LSE role
  - 3.4.1.2. Update T&E guidance
- 3.4.2. Develop new eng'g guidance (DE, ME)
- 3.4.3. Develop IP guidance
- 3.5. Potential areas for NDIA support:
  - 3.5.1. Digital engineering, mission engineering
    - 3.5.1.1. EM: ME Committee will support guidance development (TS concurs)
    - 3.5.1.2. Engage with Sandy Magness and Tom Simms
    - 3.5.1.3. Engage A&S also (via David Crimm)
  - 3.5.2. Provide input to guidance for mission engineering, acquisition pathways
    - 3.5.2.1. CS: M&S Committee will support DE guidance development
    - 3.5.2.2. Engage with Phil Zimmerman
  - 3.5.3. Focal point for interaction with industry on mission engineering (SoS and others)
  - 3.5.4. IP strategies (John Daly?)
- 3.6. Action: SoS Committee to collaborate with R&E/A&S as focal point for mission engineering and industry collaboration.**

#### **4. JEFF BOLENG OSD(A&S) SOFTWARE ACQUISITION**

- 4.1. Interested in reaching small business and non-traditional suppliers
  - 4.1.1. 70% of NDIA small business – very small % on traditional
- 4.2. Working to implement recommendations of DSB and DIB
- 4.3. Software Acquisition Pathway due to sign-out this month
  - 4.3.1. Want feedback from industry
- 4.4. Piloting (9) Single software acquisition (single color of money) in 2020
  - 4.4.1. How will we know if it's better or not? Advice requested
- 4.5. Pushing to define metrics for modern software devt (PSM, NDIA, INCOSE)
  - 4.5.1. Don't want to include unnecessary metrics
- 4.6. MBSE can only go so far; eventually, hand coding is required. Only code is maintained. When code is changed, coherence to model is degraded. Need way of updating models to drive/support code changes.
  - 4.6.1. Do not have a standard way to integrate multiple high definition models
  - 4.6.2. Open standards to MBSE
  - 4.6.3. Cannot test all – need to do some by modeling USAF simulators
  - 4.6.4. Cannot war game different models together

- 4.6.5. Need to help PM and PEO – M&S sim standards – what do you put in for interoperability on models
- 4.7. need open standards for M&S interoperability. Can NDIA help?
- 4.8. Automated DT and OT is needed to accelerate acquisition. Can AT test results be used in place of formal reviews (which slow down acquisition). Current AT focused on speed and cycle time. Need to refocus on quality
- 4.9. Action: NDIA to collaborate with OUSD A&S on source selection criteria for software.**
- 4.10. Action: NDIA consider an organizational focus on SW quality**

## **5. MELINDA REED - OSD(R&E) ADVANCED CAPABILITIES - DIRECTOR, RESILIENT SYSTEMS**

- 5.1. Wants
  - 5.1.1. Standards for HW Assurance
  - 5.1.2. SW Assurance metrics
  - 5.1.3. Need help with SW Assurance (and System Assurance) reqts beyond process orientation
- 5.2. 5000.02 – new standalone DODI for technology and program protection, Technology Area Protection Plans (TAPP) – while maintaining current program protection policy in 5000.02 enclosures. See charts for TAPP details.
- 5.3. Action: NDIA support development of technical requirements to supplement process requirements included in Cyber Survivability Endorsement (CSE) Guide, specifically tailored toward weapon systems**
- 5.4. Action: NDIA feedback on COAs for creating a standalone TPM for cyber or integrating cyber into other TPMs**
- 5.5. Action: NDIA provide feedback on what processes / specification requirements we are seeing from each service, specifically noting the conflicts and identify preferred requirements**
- 5.6. Action: NDIA microelectronics and systems engineering divisions collaborate with OSD(R&E) to create a HwA standard**
- 5.7. Action: NDIA to work with PSM on enhancing consensus measures for cybersecurity, TPM**
- 5.8. Action: Assist OUSD R&E with systems and software assurance technical requirements**

## **6. DAVID CRIM - OUSD A&S/ASD (ACQUISITION) MISSION ENGINEERING AND INTEGRATION**

- 6.1. Dr. Jim Moreland assigned ME responsibility
- 6.2. Mission engineering activities:
  - 6.2.1. Managing and analyzing capability portfolios across DoD
  - 6.2.2. Adopting a mission engineering framework – common
  - 6.2.3. Reinvigoration of Functional Capability Board (FCB)
  - 6.2.4. Quantifying measures of cost, schedule, performance at portfolio level.
  - 6.2.5. Challenges: Complexity of ME analysis; Current limitations in automation tools; Availability of and the ability to sort through data needed for analysis; Recent delegations of programs & authorities
  - 6.2.6. Portfolio management: evolve from system focus to mission areas (mission threads)
- 6.3. Wants
  - 6.3.1. Method standards for ME
    - 6.3.1.1. Consistent with industry processes and tools
  - 6.3.2. Industry forum to discuss ME (R&E currently visiting individual defense ctrs)
- 6.4. How can NDIA help?
  - 6.4.1. Promulgation of ME principles to enable assessment of joint warfighting mission effects
    - 6.4.1.1. A&S needs Mission Engineering principles promulgated to enable assessment of Joint warfighting mission effects
      - 6.4.1.1.1. Individual systems are components of the larger mission ‘system’ – leadership desire to see the entire effects chain, not new platforms in isolation
      - 6.4.1.1.2. Mission Engineering includes data exchange among systems to address cross cutting functions, end-to-end control, interoperability, and trades across systems
      - 6.4.1.1.3. Technical trades exist at multiple levels; not just within individual systems or components – how do we enable these robust trades evaluations
  - 6.4.2. Development of detailed mission architectures and common frameworks to identify capability gaps and inform investment decisions
    - 6.4.2.1.1. Development of detailed mission architectures will foster resilience, adaptability, and rapid insertion of new technologies, to identify capability gaps and inform investment decisions – but no appetite for a “chief joint architect”
    - 6.4.2.1.2. Common frameworks would allow us to efficiently evaluate mission execution approaches
- 6.5. Action: Potential action for ME project to work this relationship with DoD (A&S and R&E)**

## **6.6. Action: Consider NDIA industry workshop on mission engineering**

### **7. MICHAEL DOCTOR - DASN RDT&E (SE)**

- 7.1. Navy emphasis on mission engineering, digital engineering, digital warfare to deliver domain-based effects.
- 7.2. Design and implement comprehensive Naval Operational Architecture (NOA)
  - 7.2.1. Problem statement: lack of digital infrastructure, environment and SoS design prevents the delivery of integrated warfighting capability.
- 7.3. Digital Integration Support Cell (DISC) aligned and integrated with Digital Warfare Office (DWO) to support all major sections of Naval Digital Blueprint. Project Integration Offices (PIOs) coordinate directly with combat areas.
- 7.4. Digital Development Environment: operational architecture; integrated modeling environment; digital twin; DevSecOps; data processing/analytics; AI/ML lab.
- 7.5. Agility – experimentation and prototyping, digital models, iterative development to get early feedback and assessment of minimum viable products (fail early, fail fast). Transforming and streamlining traditional SE through Data Engineering, DevSecOps, MBSE.
- 7.6. SW Factory, DevSecOps; CI/CD. Compile to Combat in 24 Hours (C2C24)
- 7.7. Common services (track management, timing, Nav, user interface)
- 7.8. How can NDIA help?
  - 7.8.1. Please tell us how to better partner with industry on how to acquire for digital engineering – asking for the right info and the right format. (Garry: is Navy tied into effort for defining digital artifacts across the lifecycle?)
  - 7.8.2. How do we scale up or scale out? How to leverage industry best practices for scaling up.
  - 7.8.3. Help with merging partners (AWS, ...) to share data across systems, best practices for sharing and scaling.
  - 7.8.4. Interest in demonstrating DevSecOps and SE transformation (MBSE, HSI)

### **8. COMMITTEE REPORTS**

- 8.1. Architecture – Ed Moshinsky / Bob Scheurer
  - 8.1.1. 70 + members
  - 8.1.2. Publish MOSA White paper First QT 2020
  - 8.1.3. MOSA Metrics
  - 8.1.4. Modularity and Openness in Architecture Models
  - 8.1.5. MOSA Implementation w/IP & Data Rights
  - 8.1.6. 10 Recommendations – July and NDIA SE Conference

- 8.2. DT&E – Joe Manas
  - 8.2.1. Comments on OSD T&E Guidebook and DAU course material
  - 8.2.2. NAVAIR Capability Based Test and Evaluation (CBTE) Acquisition Guidebook
  - 8.2.3. MBSE of Test Project Opportunities
  - 8.2.4. Bob Behler – interest in SW DEVSECOPS – emphasis on quality
  - 8.2.5. Issue – using something like google translator – how do we know it is ok from cyber.
  - 8.2.6. Quarterly meeting
  - 8.2.7. Autonomous vehicle testing is new topic
  - 8.2.8. How can we combine events of topics like hypersonic... with other committees and divisions?
  - 8.2.9. Action: Consider how to best get emphasis on automated software test and quality across NDIA SE and T&E divisions. Engage multiple SED committees as needed.**
- 8.3. Automatic Test Committee – Pat Griffin
  - 8.3.1. General focus is at component level testing and below
  - 8.3.2. 62 members meet once a year at Auto test con
  - 8.3.3. Tasks come for DOD automated test management board
  - 8.3.4. Consider elevating the level a little – SoS, maybe SW?
- 8.4. Education & Training – Don Gelosh
  - 8.4.1. E&T Committee quiescent since 2018
  - 8.4.2. Need to figure out who provides the ‘demand signal’ for E&T? Missions, sponsors? Beyond DAU? Judith: Tom Simms is the best POC to ask.
  - 8.4.3. Sponsor for E&T and Workforce Devt may be Tom Simms
  - 8.4.4. Supporting INCOSE Portal for professional devt
- 8.5. ESOH – Sherman Forbes
  - 8.5.1. Mission is to integrate EOSH design considerations into the SE process
  - 8.5.2. Sponsor: DoD Acquisition ESOP IPT.
  - 8.5.3. Published Hazardous material SysML model library based on AIA National Aerospace Standard 411-1
  - 8.5.4. Work with AIA
- 8.6. HSI (Matt Risser)
  - 8.6.1. Joint HSI Working Group (JHSIWG). ~40 people on distribution list, a few core people doing work.
  - 8.6.2. Alignment between NDIA SE Division (process, guidance) and NDIA Human Systems Division (technology, R&D).

- 8.6.3. Should engage with INCOSE HSI WG. Series of workshops planned in 2020, and bi-annual conference. POC: Guy Boy.
- 8.7. Modeling and Simulation
  - 8.7.1. 2019 Applications
    - 8.7.1.1. DEIXWG (Joint INCOSE/OSD/NDIA)
      - 8.7.1.1.1. High-Level Concept (HLC) Document Produced
      - 8.7.1.1.2. Digital Viewpoint Model (DVM) progress (IEEE 15288 based)
      - 8.7.1.1.3. Standards Application progress and integration
      - 8.7.1.1.4. Digital Integration “Challenge”
    - 8.7.1.2. Model-Based Source Selection Workshop
      - 8.7.1.2.1. August Workshop (NDIA/NAVAIR/Aerospace)
    - 8.7.1.3. MBSE Survey (Joint INCOSE/NDIA/more)
    - 8.7.1.4. Continued MBSE and M&S topics
  - 8.7.2. 2020 Plans
    - 8.7.2.1. Continued DEIXWG work (joint NDIA/INCOSE/OSD)
      - 8.7.2.1.1. Digital View Model development
      - 8.7.2.1.2. Continued Standards Integration
        - 8.7.2.1.2.1. PDES
        - 8.7.2.1.2.2. ASME
        - 8.7.2.1.2.3. More
    - 8.7.2.2. Model-Based Acquisition Workshop
      - 8.7.2.2.1. Wrap-up
      - 8.7.2.2.2. Follow-on Activity with NAVAIR
    - 8.7.2.3. Digital Integration “Application” Topics
      - 8.7.2.3.1. MBSE Integration (Customer/Provider, Cross-Eng)
      - 8.7.2.3.2. M&S and Analysis Integration
  - 8.7.3. OSD Sponsor wants more on how to apply MBSE (Descriptive modeling, use of MBSE)
  - 8.7.4. Can you gather success stories?
- 8.8. Software – Ken Niddifer
  - 8.8.1. Participated in development of Software Assurance Program Manager Guide Book and Developers Guide Book
- 8.9. SoS (Judith Dahmann)
  - 8.9.1. Leadership: Rick Poel (Boeing); Jennie Horne (Raytheon); John Daley (BAH); Judith Dahmann (MITRE)
  - 8.9.2. Expanded emphasis on interoperability, mission engineering. Continuing SoS Collaborators Information Exchange (SoSECIE). Completed draft ‘Mission Engineering Phase II Study: Industry Role in ME’, May 2019 > 2020: Phase 2 Report.
- 8.10. SE Effectiveness Committee (Joe Elm)
  - 8.10.1. No progress since 2015 – no plans for 2020. Need to consider organization and go-forward plan.



- 8.11. SSE Committee (Cory Ocker)
  - 8.11.1. Liaison: Melinda Reed. Collaborations w/ AF CROSW, NAVAIR 4.0, JFAC, NNSA, SAE, INCOSE, IEEE, SCRM COI. Need a roadmap for DoD organizations with swim lanes.
  - 8.11.2. 300 people on mailing list, ~20 that do work.
  - 8.11.3. 2020 focus: System Security Symposium (April 2020). Help establish a separate SW Assurance Committee in conjunction w/ JFAC. Evaluate NDIA SCRM survey for actions.
  - 8.11.4. Planned Activities
    - 8.11.4.1. Collaboration with OSD, Services, JFAC, NNSA
    - 8.11.4.2. SCRM Community of Interest
    - 8.11.4.3. AF Policy Review to minimize compliance activities
  - 8.11.5. Planned Events
    - 8.11.5.1. IEEE, NDIA, INCOSE System Security Symposium April 2020
  - 8.11.6. Planned Publications
    - 8.11.6.1. Standardization – DIDs, WBS
    - 8.11.6.2. 5000.02 Review
    - 8.11.6.3. OSD Org Chart with SSE Swim Lanes
  - 8.11.7. 2019 Accomplishments
    - 8.11.7.1. USAF Weapon System Program Protection and System Security Engineering Process Guidebook
    - 8.11.7.2. NDIA Critical Program Information (CPI) Assessment and Identification Guide (CAIG)
    - 8.11.7.3. DoD DRAFT Software Acquisition Pathway Policy Guidance
    - 8.11.7.4. Cyber Secure & Resilient Approaches for Feature Based Variation Management
    - 8.11.7.5. IEEE, NDIA, INCOSE System Security Symposium April 2020
    - 8.11.7.6. NDIA Systems & Mission Engineering Annual October Conference
    - 8.11.7.7. NIST SP 800-160 Developing a Cyber Resilient Systems Vol 2: A Systems Security Engineering Approach
    - 8.11.7.8. DASD(R&E) Sponsored SEI SwA Products, PM & Designer Guide
    - 8.11.7.9. DoD Cyber Workforce Management
    - 8.11.7.10. SAE G32 Cyber Physical Systems
    - 8.11.7.11. ASD(R&E) Cybersecurity Challenges – Protecting DoD Unclassified Information
    - 8.11.7.12. NAVAIR CyberSafe
    - 8.11.7.13. AF CROWS Program Protection and System Security Engineering Tools
    - 8.11.7.14. ASD(R&E) CRWS Workshop Series
    - 8.11.7.15. SecNav Cybersecurity Advisory Panel Meeting
    - 8.11.7.16. Collaboration on Quality in the Space & Defense Industries Forum, March 2019
  - 8.11.8. 2020 Plans
    - 8.11.8.1. Primary Focus: IEEE NDIA INCOSE System Security Symposium, 6-9 April 2020
    - 8.11.8.2. Collaboration/engagement with NNSA, JFAC, Services, OSD
    - 8.11.8.3. OSD Organization Chart with SSE Swim Lanes

- 8.11.8.4. Support OSD Standardization Efforts – Data Item Descriptions, Work Breakdown Structure, etc
- 8.11.8.5. Help establish a Software Assurance Committee in conjunction with JFAC
- 8.11.8.6. SCRM Community of Interest awareness and participation
- 8.11.8.7. Provide recommendations based on recent NDIA Survey on SCRM
- 8.11.8.8. Air Force policy review to minimize compliance activities
- 8.11.8.9. Advocate for a program perspective on CDI – implementation and impacts
- 8.11.8.10. Standards review, comment, and analyze as appropriate:
  - 8.11.8.10.1. NIST 800-53 Rev 5 Security and Privacy Controls for Federal Information Systems and Organizations
  - 8.11.8.10.2. SAE G32 Cyber Physical Systems
  - 8.11.8.10.3. Cybersecurity Maturity Model Certification
  - 8.11.8.10.4. DoDI & DoDM 8140 Cyberspace Workforce Management
- 8.11.8.11. Review and consider SSE related impacts of 5000.02 update

## **9. ORG CHART REVIEW:**

- 9.1. Agile and SE: re-charter; SE agility is an opportunity; we need more emphasis and strategy on agility in SE
- 9.2. M&S: capture DT&E concerns using M&S
- 9.3. EHM: assess business case and action plan
- 9.4. ESOH: need to grow industry engagement – consider an email blast
- 9.5. SSE: need to consider how to deal with all aspects of assurance

## **10. NEXT MEETINGS:**

- 10.1. Wed 2/12; Wed 4/15; Wed 6/17; Wed 8/19; Wed ~12/9