OSD Engineering Enterprise:
Digital Engineering Initiatives

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**Office of the Deputy Assistant Secretary of Defense
for Systems Engineering**

NDIA SE M&S Committee Meeting

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- **Overview of Engineering Enterprise**
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DASD, Systems Engineering

Acting Deputy Assistant Secretary of Defense and Principal Deputy, Systems Engineering
Kristen Baldwin

Homeland Defense Capability Development
Robin Hicks

Major Program Support
James Thompson

Engineering Enterprise
Robert Gold

Supporting USD(AT&L) Decisions with Independent Engineering Expertise

- Engineering Assessment / Mentoring of Major Defense Programs
- Program Support Assessments
- Overarching Integrated Product Team and Defense Acquisition Board Support
- Systems Engineering Plans
- Systemic Root Cause Analysis
- Development Planning/Early SE
- Program Protection

Leading Systems Engineering Practice in DoD and Industry

- Systems Engineering Policy and Guidance
- Technical Workforce Development
- Specialty Engineering (System Safety, Reliability and Maintainability, Quality, Manufacturing, Producibility, Human Systems Integration)
- Security, Anti-Tamper, Counterfeit Prevention
- Standardization
- Engineering Tools and Environments

Providing technical support and systems engineering leadership and oversight to USD(AT&L) in support of planned and ongoing acquisition programs

Engineering Enterprise Organization

Engineering Enterprise
Robert Gold

Systems Engineering Policy, Guidance, and Workforce
Aileen Sedmak

Engineering Tools and Environments: Digital Engineering Design, Engineered Resilient Systems, MOSA
Philomena Zimmerman

Specialty Engineering: R&M, Manufacturing, Value Engineering, System Safety
Andrew Monje

Software Assurance, Joint Federated Assurance Center (JFAC)
Thomas Hurt

Hardware Assurance, Anti-Tamper
Raymond Shanahan

System of Systems
Dr. Judith Dahmann

Standards & Standardization (DSPO)
Greg Saunders, Director
Stephen Lowell, Deputy

NATO/International/Web
Latasha Beckman
Procedures & DIDs
Karen Bond
DAU Liaison/Stdzn Journal/ PA/ASSIST/QPL/WSIT
Timothy Koczanski
Parts Mgmt/Qual Pgm
Donna McMurray
DMSMS/Counterfeit
Alex Melnikow
GIDEP/Anti-Counterfeit
James Stein
Budget Mgr, JSB
Lloyd Thomas
Non-Govt Stds/FARpt11
Trudie Williams

Engineering Enterprise Strategic Objectives

- **Manage the whole of our engineering activities**
  - Workforce
  - Tools & Environments
  - Systems, domain-specific, and specialty engineering
  - Systems-of-systems
  - Assurance
  - Effectiveness
- **Establish collaboration with technical leads at major engineering activities and industry partners**
  - Foster information exchange
  - Identify and understand common challenges
  - Provide top cover for Component and Industry initiatives
  - Facilitate improvements to the state of practice
  - e.g., federating Software/Hardware Assurance people and organizations under Joint Federated Assurance Center (JFAC)
- **Promote investments in engineering S&T, for example**
  - Automated detection of vulnerabilities and defects in Department SW
  - Detection of binary malicious insertions in operational SW
  - Innovative technologies for rapid inspection and analysis of microelectronics

**Understand and Improve DoD's Collective Engineering Enterprise**

Engineering Tools and Environments

Digital Engineering

Transforming DoD towards model-centric practices by shifting from a linear, document-centric acquisition process towards a dynamic digital model-centric <u>ecosystem</u>

— **Digital System Model: Develop a structure for organizing programs' technical data**
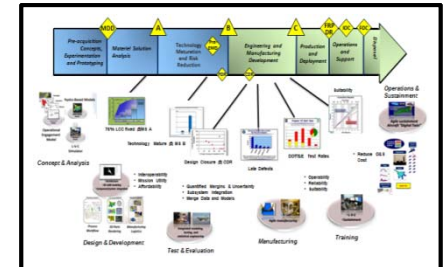

Modular Open Systems Architecture

Identifying data, standards, and tools for modular and open systems design; identifying acquisition approaches and support for more capable, modular, and rapidly upgradeable systems

Defense Standardization Council
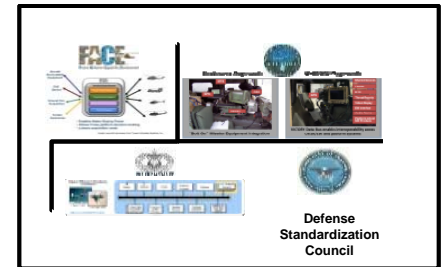
Engineered Resilient Systems
Developing integrated suite of modern engineering tools: models and related capabilities, tradespace assessment and visualization tools; all within an architecture aligned with acquisition and operational business processes
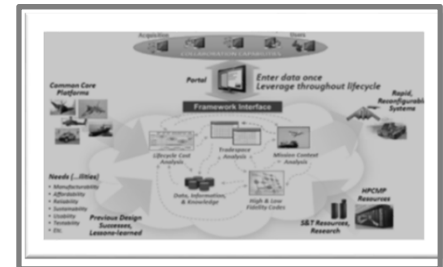
Engineering methods, processes, tools and techniques incorporating the latest digital practices for making informed decisions throughout the acquisition life cycle
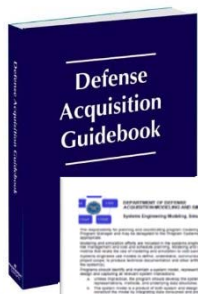
Leveraging Multiple Activities to Advance Digital Engineering within DoD
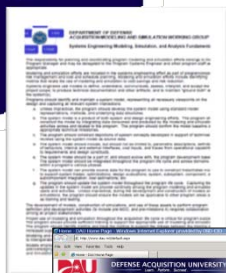
Infusion in Policy and Guidance

DoDI 5000.02, Enclosure 3, Section 9: Modeling and Simulation

Defense Acquisition Guidebook Chapter 4

DoD Digital Engineering Fundamental

Defense Acquisition Guidebook Chapter 4

http://www.acq.osd.mil/se/pg/guidance.html
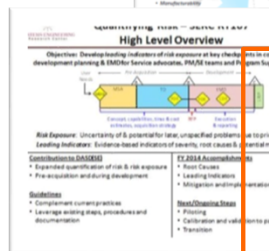
DoD Initiatives
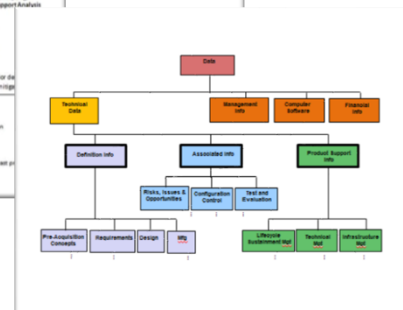
Digital Engineering Working Group

DoD Digital Engineering Working Group

ERS: Adapting to changing requirements

SERC: Model Centric Collaborative Environment

DSM Taxonomy: Foundation for defining categories of data across acquisition

Other Partnerships

IAWG

Inter-Agency Working Group on the Engineering of Complex Systems

Additive Manufacturing

NASA: Sounding Rocket Program

NDIA: Essential Elements of the System Model
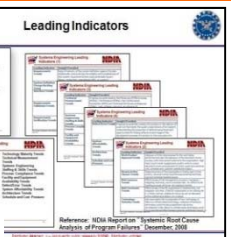
USAF Own the Technical Baseline

Digital Thread/Digital Twin

Advancing the state of practice for Digital Engineering within DoD

FY16 Plans for
Digital Engineering (DE)

Establish a robust exchange of best practices from an enterprise view and a means for DE stakeholder communities to collaborate across government and industry

- ## Advance Current *Body-of-Practice*

  – Provide the foundation for transitioning acquisition processes to a digital engineering environment

  – Examine the current state of practice, identify gaps, and begin to transform the future state of DE

- ## Establish & Execute Future *Body-of-Work*

  – Develop a body of work across critical focus areas to support implementation of DE across DoD

  – Deliver a set of artifacts to enable government and industry to move towards a DE implementation across DoD

Digital Engineering Working Group (DEWG)

- **Establish a open collaboration across DoD and other stakeholder communities**
  - Lead and cultivate efforts to address common practices and concerns of shifting from traditional acquisition processes to digital model-centric processes while pursuing cross-cutting issues within the systems engineering and across the acquisition community
  - Develop consistent messaging for DE throughout the DoD
  - Foster the development and use of new model-centric engineering practices and processes to aid in the acquisition of the world's best warfighting capabilities
  - Collaborate with industry to achieve common digital model-centric approaches across industry and DoD applications
  - Serve as the DoD systems engineering outreach to academia for the research and exchange of information related to model-centric technology, methodology/approach and usage

Digital Engineering Working Group (DEWG)

- **Provide an integrated approach for DoD from an enterprise view**

  - The DEWG will investigate the acquisition processes, change management, and technical approaches that enable digital engineering across DoD.

  - The DEWG will access gaps and best practices between stakeholder communities and their respective processes that impact the use of digital engineering across DoD

- **Current DoD membership includes:**

  - **US Army**
  - **US Navy**
  - **US Air Force**

  - **DISA**
  - **DLA**
  - **MDA**

Invite representatives from industry that can provide input to the digital engineering community of practice.

Digital Engineering Focus Areas

1. **Definition**
   - Defining the concept for the future state
2. **Implementation**
   - Identifying the standards, methods, processes, tools to implement
3. **Policy and Guidance**
   - Recommending changes to policy and guidance
4. **Workforce Development**
   - Identifying the education and training across DoD
5. **Contracting**
   - Identifying contracting language for both technical and business aspects
6. **Metrics**
   - Defining how to measure and manage performance
7. **Change Management**
   - Identifying approaches and best practices to enable adoption

Systems Engineering:
Critical to Defense Acquisition

Defense Innovation Marketplace
http://www.defenseinnovationmarketplace.mil

DASD, Systems Engineering
http://www.acq.osd.mil/se

Information

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