



DoD Systems Engineering Policy, Guidance and Standardization

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

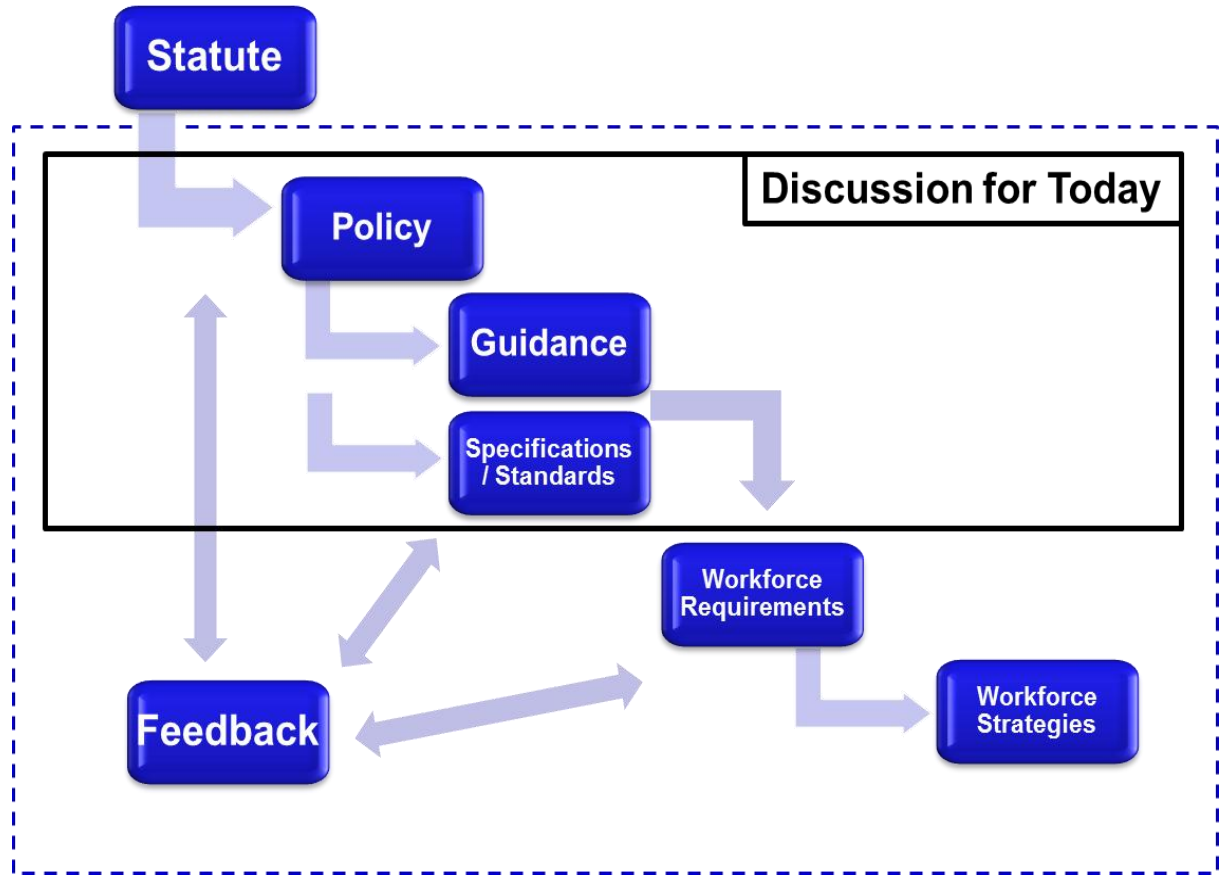
**19th Annual NDIA Systems Engineering Conference
Springfield, VA | October 26, 2016**



Strategic Overview

Update Drivers

- Better Buying Power 3.0
- SE Best Practices
- Statutory Requirements



Evidence-based policies and practices to improve acquisition program performance



Topics of Discussion



➤ **Policy:**

- DoDI 5000.02
- Rapid Fielding/Rapid Prototyping Acquisition Policy

• **Guidance:**

- DAG Chapter 3 Systems Engineering
- Defense Acquisition of Technical Services
- Additional SE Guidance efforts

• **Specifications and Standards:**

- 15288 Implementation Guide
- MIL-HDBK-61A
- Systems of Systems (SoS) NGS

• **Plans for 2017**



SE-Related Updates to DoDI 5000.02



- **Core Instruction - Operation of the Defense Acquisition System**

- **Enclosures**

1. Acquisition Program Categories and Compliance Requirements
2. Program Management
3. Systems Engineering
4. Developmental Test and Evaluation (DT&E)
5. Operational and Live Fire Test and Evaluation (OT&E and LFT&E)
6. Life-Cycle Sustainment
7. Human Systems Integration (HSI)
8. Affordability Analysis and Investment Constraints
9. Analysis of Alternatives (AoA)
10. Cost Estimating and Reporting
11. Requirements Applicable to All Programs Containing Information Technology (IT)
12. Defense Business Systems (DBS)
13. Rapid Fielding of Capabilities

NDA FY 2016, Section 822 – Risk Management for MDAP and Major Systems

NDA FY 2016, Section 832 – DASD(SE) Duties

Changes to Reflect SwA Best Practices

NDA FY 2015, Section 801 – MOSA in Acquisition Programs

Plan to publish by end of CY 2016



Changes to DoDI 5000.02 Enclosure 3



DoDI 5000.02 (7 Jan 2015) Enclosure 3 Systems Engineering

1. Purpose
2. [Systems Engineering Plan](#) ←
3. Development Planning
4. Systems Engineering Trade-Off Analyses
5. Technical Risk and Opportunity Management
6. Technical Performance Measures and Metrics
7. Technical Reviews
8. Configuration Management
9. Modeling and Simulation
10. Manufacturing and Producibility
11. Software
12. Reliability and Maintainability
13. [Program Protection](#) ←
14. [Open Systems Architectures](#) ←
15. Corrosion Prevention and Control
16. Environment, Safety, and Occupational Health
17. Insensitive Munitions
18. Item Unique Identification
19. Spectrum Supportability
20. [Program Support Assessments](#) ←

NDA FY 2016, Section 832 – DASD(SE) Duties

Changes to Reflect SwA Best Practices

NDA FY 2015, Section 801 - MOSA in Acquisition Programs



Summary of Changes



- **Approval authority for SEPs assigned to the Milestone Decision Authority (MDA)**
- **Software assurance (SwA) policy updated to include best practices implementation of tools and risk-based remediation**
- **“Modular Open Systems Approach” replaces “Open Systems Architecture”**
- **DASD(SE) required to advise on incorporation of best practices for SE from across the Department**
- **Risk mitigation techniques required for consideration**



Rapid Prototyping and Rapid Fielding Acquisition Policy



New agile and efficient acquisition processes to accelerate our speed of innovation, maintain our technological edge, and rapidly deliver warfighting capabilities

Rapid Prototyping

- Innovative technologies
- Rapidly develop fieldable prototypes
- Demonstrate in an operational environment
- Provide a residual operational capability within five years

Accelerate access to transformative technologies

Rapid Fielding

- Proven technologies
- Rapidly field production quantities
- Minimal development
- Begin production within six months
- Complete fielding within five years

Expedite production and deployment of proven technologies

P.L. 114-92, SEC 804



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Defense Acquisition Guidebook (DAG) Update

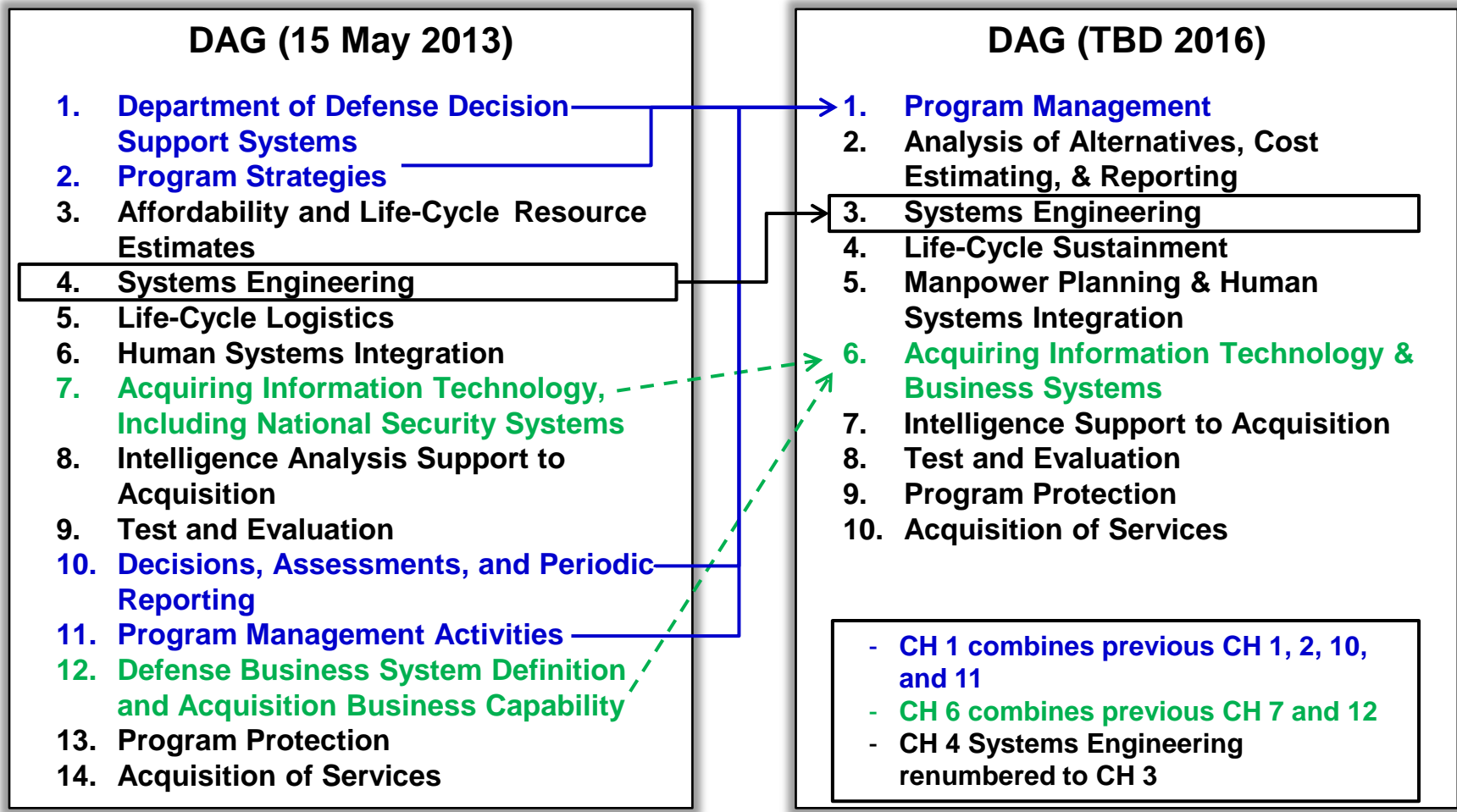


- **Align to the updated DoDI 5000.02, “Operations of the Defense Acquisition System”**
- **Address recommendations from the Better Buying Power 3.0 *Streamline documentation requirements and staff reviews***
- **Incorporate recognized Department-wide best practices**
- **Follow the new DAG Editorial Guidelines**

Plan to publish on the DAU website end of CY 2016



DAG Update – Table of Contents Restructure*



*Restructure pending leadership approval

The DAG has been restructured to combine chapters



Mapping Current DAG C4 Outline to New DAG C3 Outline



Current DAG Chapter 4 Outline	New DAG Chapter 3 Outline
4.0 Overview 4.0.1 Purpose 4.0.2 Contents	1.0 Overview 1.1 Purpose 1.2 Contents
4.1 Introduction 4.1.1 SE Policy and Guidance 4.1.2 Systems Engineering Plan 4.1.3 Systems Level Considerations 4.1.4 Engineering Resources 4.1.5 Certifications 4.1.6 SE Role in Contracting	2.0 Introduction 2.1 SE Policy and Guidance 2.2 Systems Engineering Plan 2.3 Systems Level Considerations 2.4 Tools, Techniques, and Lesson Learned 2.5 Engineering Resources 2.6 Certifications 2.7 SE Role in Contracting
4.2 SE Activities in the Life Cycle 4.2.1 Life Cycle Expectations 4.2.2 – 4.2.7 Acquisition Phases 4.2.8 – 4.2.17 Technical Reviews and Audit	3.0 SE Activities in the Life Cycle 3.1 Life Cycle Expectations <u>3.2 Acquisition Phases</u> <u>3.3 Technical Reviews and Audits</u>
4.3 SE Processes 4.3.1 SE Processes Overview 4.3.2 – 4.3.9 Technical Management Processes 4.3.10 – 4.3.17 Technical Processes 4.3.18 Design Considerations <u>4.3.19 Tools, Techniques, and Lessons Learned</u>	4.0 Process Integration <u>4.1 Technical Management Processes</u> <u>4.2 Technical Processes</u> 4.3 Design Considerations

Legend

New Section Header:

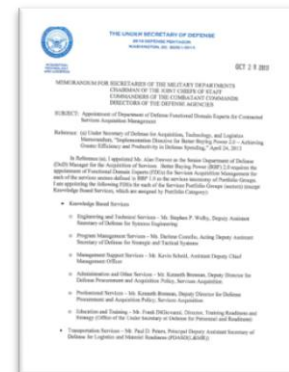
Relocated Section:



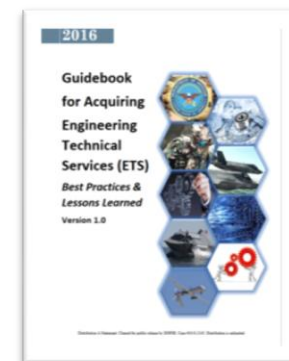
Acquisition of Engineering Technical Services (ETS)



- USD(AT&L) appointed DASD(SE) as Functional Domain Expert (FDE) for Engineering and Technical Services (Oct 2013)
- DoDI 5000.74, “Defense Acquisition of Services” (Jan 5, 2016) superseded Enclosure 9 of DoDI 5000.02
- Guidebook for Acquiring Engineering Technical Services: Best Practices and Lessons Learned, Version 1.0 issued (July 2016)
 - Supports Better Buying Power 3.0 *Improve the Effectiveness and Productivity of Contracted Engineering and Technical Services*
 - Target Audience: DoD personnel contracting/buying ETS
 - Objective: Provides suggested strategies for acquiring ETS, important considerations, and implications of different strategies



USD(AT&L) Memorandum, “Appointment of DoD FDE for Contracted Services Acquisition Management,” Oct 28, 2013



Guidebook for Acquiring Engineering Technical Services: Best Practices and Lessons Learned, Version 1.0

The Guide can be found at <<http://www.acq.osd.mil/se/docs/ETS.pdf>>



Other New SE Guidance, White Papers and Publications



- ***Interactions Among the Warfighter, Science & Technology, and Acquisition Communities*** (Nov 2015), developed by the DoD Development Planning Working Group
- ***SD-22 – Diminishing Manufacturing Sources and Material Shortages (DMSMS): A Guidebook of Best Practices for Implementing a Robust DMSMS Management Program*** (Jan 2016), developed by the Defense Standardization Program Office
- ***Systems Engineering Digital Engineering Fundamentals (Including Models and Simulations)*** (March 2016), developed by the DoD Digital Engineering Working Group
- Baldwin, Kristen J., and D. Scott Lucero. "Defense System Complexity: Engineering Challenges and Opportunities" *ITEA Journal of Test and Evaluation* 37.1 (2016): 10-16. JSTOR. Web. March 2016
- Horowitz, Barry M., and D. Scott Lucero. "System-Aware Cyber Security: A Systems Engineering Approach to Cyber Security" *INCOSE Insight* 19.2 (2016): 39-42. JSTOR. Web July 2016

These documents can be found at
< <http://www.acq.osd.mil/se/pg/guidance.html> > &
< www.acq.osd.mil/se/outreach/pubs.html >



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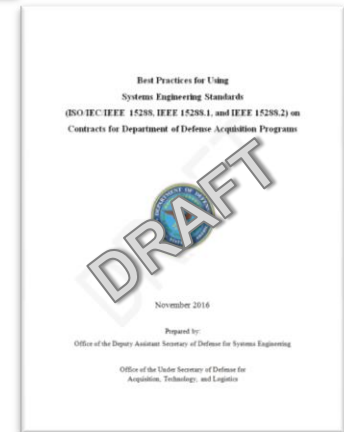
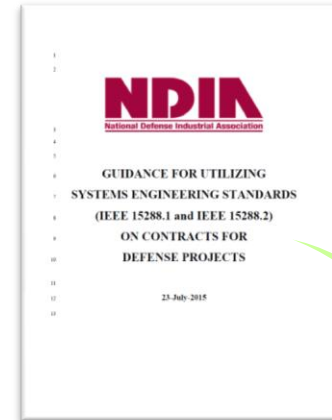


ISO/IEC/IEEE15288, IEEE 15288.1, and IEEE 15288.2 DoD Implementation Guidance



- Leveraging the formally submitted NDIA recommended guidance
- Focusing on how to tailor the SE standards to program-specific needs
- Tailoring considerations
 - Key program characteristics (e.g. complexity, size, domain, risk)
 - Acquisition phase(s)
- Providing example RFP language as well as insight for interpreting and monitoring contract compliance
- Completing final coordination

NDIA Recommended 15288 Implementation Guide



DoD 15288 Implementation Guide

Plan to publish by end of CY 2016



MIL-HDBK-61A Update

- **Update MIL-HDBK-61A, “Configuration Management Guidance” to provide overarching guidance for Configuration Management (CM) on DoD programs**
 - Expand on CM content in DAG and convey current CM best practices
 - Provide guidance to programs, especially when they choose not to invoke voluntary CM standards, such as SAE/EIA 649-1, on contract
- **Additional Areas to be Addressed:**
 - CM of electronic data models
 - State of the art for systems design and development has evolved over time
 - Use of non-digital documentation has migrated to use of digital artifacts
 - CM of software elements versus hardware elements
 - Prevalence of ever greater reliance on software/firmware in DoD systems
- **Provide relationship between EIA 649, SAE/EIA 649-1, and GEIA HB-649**



Systems of Systems Engineering (SoSE) Standardization



ISO/IEC JTC 1/SC1
SoSE Study Group Report

- **Conclusions of ISO/IEC study group are to move the state of SoSE practice forward by**
 - Pursuing top level SoS standards to aid in communication across SoS domains
 - Identifying existing standards to inform the SoS community about applicable available standards, preclude duplication of standards, and promote broader use of current standards
 - Developing guidance on applying existing standards to assist in tailoring standards to SoS characteristics and constraints
- **Recommended new work initiatives**
 - Taxonomy of SoS Types (elaboration of ISO/IEC 15288 Annex G)
 - Application of SE Processes for SoSE across the life cycle (elaboration of ISO/IEC 15288 Annex G)
 - SoS Lifecycle Review for Systems (based on TTCP Recommended Practices; already aligned to ISO/IEC 15288)
- **Projected timeline runs through calendar year 2017**
 - International balloting to gauge interest for new work initiatives closed September 2016



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➤ Plans for 2017



Plans for 2017



- **Continue to Monitor to Change Drivers Updates**
- **Finalize DoDI 5000.02 Change 1 Revision**
- **Finalize Rapid Fielding/Rapid Prototyping Acquisition Policy**
- **Publish updated DAG Chapter 3 Systems Engineering**
- **Publish DoD 15288 Implementation Guide**
- **Revise MIL-HDBK-61A**
- **Support development of SoS NGS Efforts**



Systems Engineering: Critical to Defense Acquisition



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

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



For Additional Information



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