MOSA Verification and Standards Conformance in DoD Acquisition

27th Annual National Defense Industrial Association Systems and Mission Engineering Conference

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for Research and Engineering

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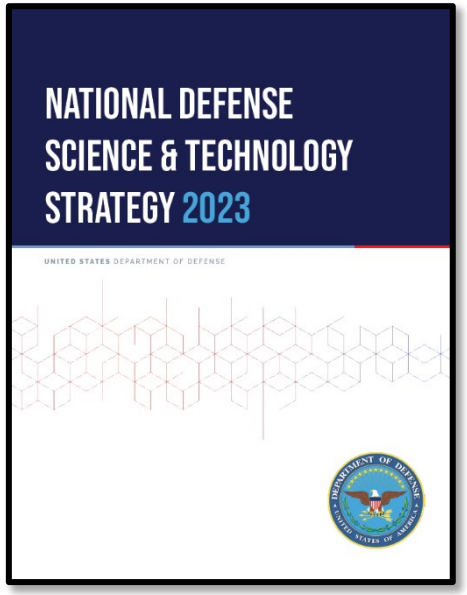
MOSA Is a Priority in the Department of Defense

Heidi Shyu
Under Secretary of Defense for Research and Engineering

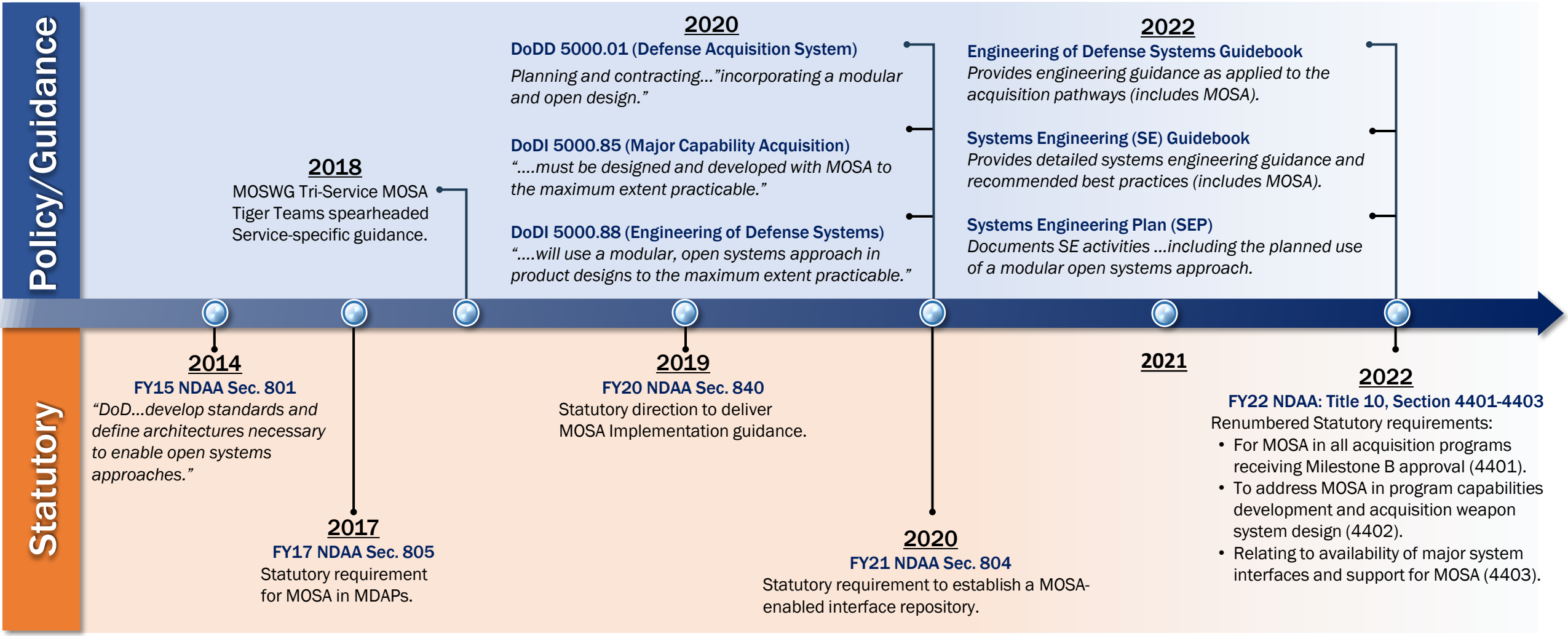
"As we embrace MOSA, we are not just adopting a new approach to defense systems; we are ushering in a new era of collaboration, competition, and innovation."

2024 Department of Defense Engineer's Week Closing Remarks



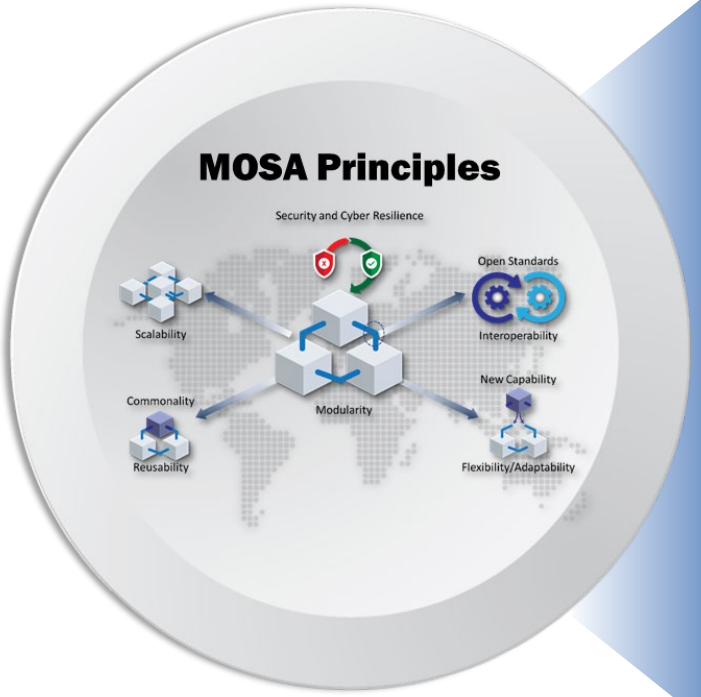
"As highlighted by the National Defense Science and Technology Strategy, the DoD needs to "overhaul its approach to force development, design, and business management practices," by ***transitioning to an approach that "incentivize(s) the design of open systems that can rapidly incorporate cutting-edge technologies,"*** *and "rewards rapid experimentation, acquisition, and fielding."*

MOSA: Statutory & Regulatory Background



MOSA: Statutory Direction

U.S.C. Title 10 §4401-4403: MOSA is … an integrated business and technical strategy….



DoD/Components:

- … ensure that sufficient systems engineering and development expertise….
- … issue guidance to implement the requirements….

Program … uses a system architecture that allows severable major system components and modular systems….

System

- … subjected to verification….
- … complies with the technical data rights….

Acquisition Strategy

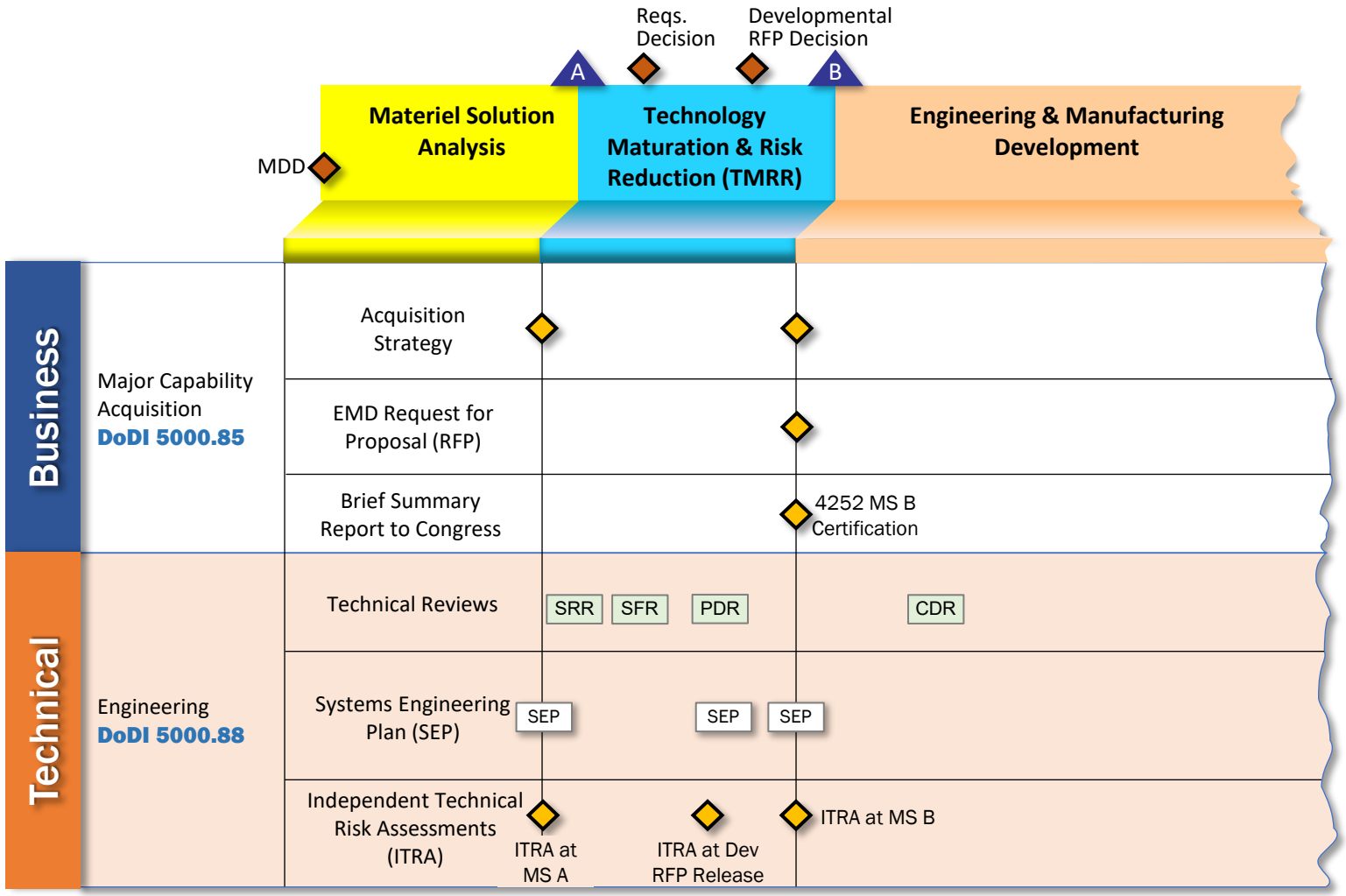
- … describes the modular open system approach to be used….
- … describes how intellectual property and related issues, such as technical data deliverables … will be addressed….
- … describes the approach to systems integration and systems-level configuration management….

Contract … includes requirements for the delivery of modular system interfaces for modular systems.

Additional implementation guidance and changes to Defense Federal Acquisition Regulation Supplement (DFARS) are in development

MOSA Activities: Major Capability Acquisition Pathway

SRR: System Requirements Review
SFR: System Functional Review
PDR: Preliminary Design Review
CDR: Critical Design Review



Key MOSA Activities Early in Acquisition

Address MOSA implementation and MOSA-related tech data or software, including intellectual property (IP)
Include MOSA and IP requirements as well as contract deliverables
Include a statement of whether MOSA is being used
Review the progress of implementing MOSA during development
Describe how the program addresses MOSA in the system design process
Review implementation of MOSA and any associated risks

MOSA Verification Testing: At the Beginning and to the End

- **Analysis of Alternatives**
  - Must contain a MOSA whether applicable to the program or not
- **Systems Engineering Plan**
  - Will identify how the system will implement MOSA across its life cycle
- **System Requirements Review**
  - Requirements documents must contain technical and logical requirements that define the MOSA
- **Test and Evaluation Master Plan**
  - Ensure continuous testing and evaluation is a part of the MOSA

MOSA verification testing of a MOSA must include both hardware and software

MOSA Verification Testing: Policy and Guidance Potential Updates

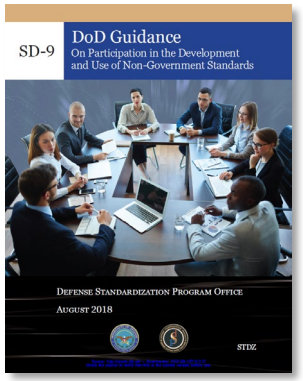
Document Title
JCIDS Manual for Operation of the Joint Capabilities Integration and Development System
DoDI 5000.80 Middle Tier of Acquisition
DoDI 5000.87 Operation of the Software Acquisition Pathway
DoDI 5000.88 Engineering of Defense Systems
DoDI 5000.89 Test and Evaluation
DoDI 5000.91 Product Support Management for the Adaptive Acquisition Framework
DoDI 7041.03 Economic Analysis for Decision-making
DoDI 5010.44 Intellectual Property (IP) Acquisition and Licensing

DoDI 5000.85 Major Capability Acquisition is in the process of being updated

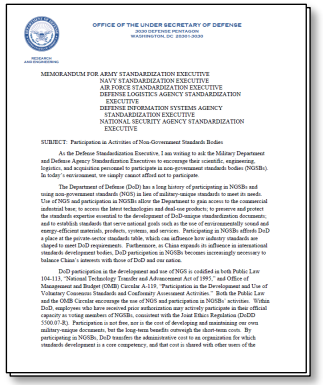
MOSA Implementation: Standards Conformance

Value of DoD Participation in Standards Development

- ✓ Gain access to the commercial industrial base
- ✓ Access the latest technologies & dual-use products
- ✓ Meet national goals
- ✓ Maintain & develop expertise
- ✓ Influence how industry standards are shaped to meet DoD requirements
- ✓ Spur innovation & provide superior product



August 2018 DSPO Guidance on Participation in the Development and Use of NGSs


OFFICE OF THE UNDER SECRETARY OF DEFENSE

MEMORANDUM FOR ARMY STANDARDIZATION EXECUTIVE
NAVY STANDARDIZATION EXECUTIVE
AIR FORCE STANDARDIZATION EXECUTIVE
DEFENSE LOGISTICS AGENCY STANDARDIZATION EXECUTIVE
DEFENSE INFORMATION SYSTEMS AGENCY STANDARDIZATION EXECUTIVE
NATIONAL SECURITY AGENCY STANDARDIZATION EXECUTIVE

SUBJECT: Participation in Activities of Non-Government Standards Bodies

November 2021 DD, Engineering Memo "Participation in Activities of Non-Government Standards Bodies"

Ref. Section 12(d) of Public Law 104-113: "Utilization of Consensus Technical Standards by Federal Agencies"

Typical Standards

Attributes the DoD Seeks

Performance-based (essential characteristics rather than detailed design)

Widely supported (use across different areas/sectors including dual-use commercial/defense)

Avoid technical barriers (greater product availability)

Uniformly describe data (dual-use by commercial/Defense and reusability)

But Where Is Standards Conformance? Where Should It Start?

Begin with the end in mind!

- Plan the MOSA strategy with defined objectives
- Modularize by decomposing system capabilities into functional modules
- Specify interfaces by identifying connections between system building blocks
- Define interface specifications by capturing how functional modules interact
- Standardize interface specifications to allow for opportunities of future modernization

All About the Standards – Standards Conformance Approach

1. **Understand and Define Requirements**
   a. Identify system requirements.
   b. Determine relevant standards.
2. **Select Applicable Standards**
   a. Evaluate standards.
   b. Adopt open standards, when possible, but be mindful of security concerns.
   c. Prioritize open standards that promote interoperability, reusability, and long-term sustainability of the system.
   d. Tailor standards.

All About the Standards – Standards Conformance Approach

3. Validate and Verify

a. Define modules.

b. Apply standards in design.

c. Verify interface compatibility.

4. Maintain and Evolve

a. Develop modules.

b. Integrate modules.

c. Test conformance.

All About the Standards – Standards Conformance Approach

5. Life Cycle Management

a. Conduct compliance testing.

b. Obtain certification.

c. Document compliance.

6. Maintain and Evolve

a. Monitor standards updates.

b. Plan for upgrades.

c. Support modular upgrades.

All About the Standards - Standards Conformance Approach

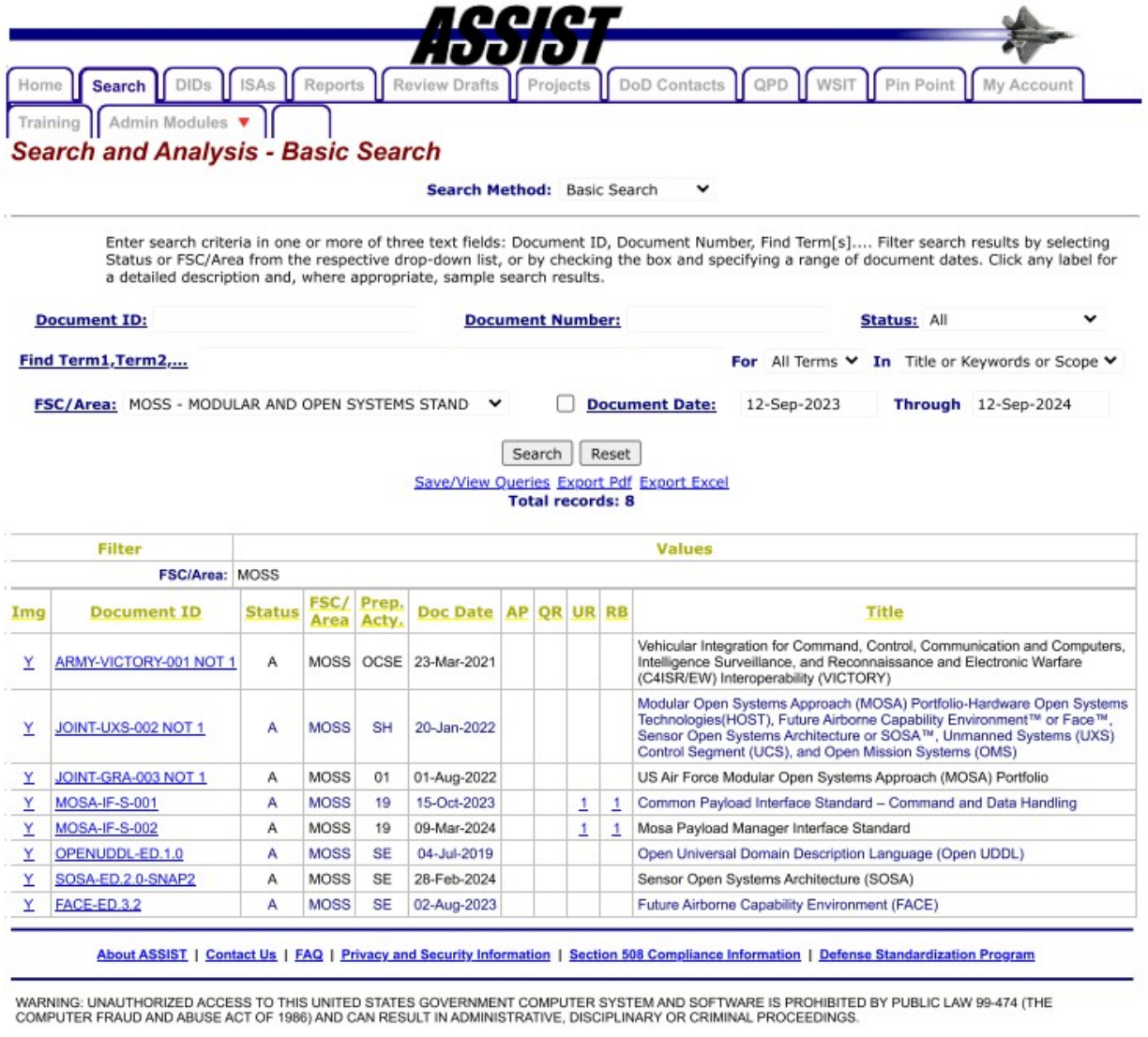
7. Life Cycle Management

a. Implement configuration management.

b. Document lessons learned.

c. Engage in continuous improvement.

ASSIST Database hosts the Modular Open Standards and Specifications (MOSS) Area



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FSC/Area: MOSS - MODULAR AND OPEN SYSTEMS STAND **Document Date:** 12-Sep-2023 **Through** 12-Sep-2024

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Y	ARMY-VICTORY-001 NOT 1	A	MOSS	OCSE	23-Mar-2021					Vehicular Integration for Command, Control, Communication and Computers, Intelligence Surveillance, and Reconnaissance and Electronic Warfare (C4ISR/EW) Interoperability (VICTORY)
Y	JOINT-UXS-002 NOT 1	A	MOSS	SH	20-Jan-2022					Modular Open Systems Approach (MOSA) Portfolio-Hardware Open Systems Technologies(HOST), Future Airborne Capability Environment™ or Face™, Sensor Open Systems Architecture or SOSA™, Unmanned Systems (UXS) Control Segment (UCS), and Open Mission Systems (OMS)
Y	JOINT-GRA-003 NOT 1	A	MOSS	01	01-Aug-2022					US Air Force Modular Open Systems Approach (MOSA) Portfolio
Y	MOSA-IF-S-001	A	MOSS	19	15-Oct-2023			1	1	Common Payload Interface Standard – Command and Data Handling
Y	MOSA-IF-S-002	A	MOSS	19	09-Mar-2024			1	1	Mosa Payload Manager Interface Standard
Y	OPENUDDL-ED.1.0	A	MOSS	SE	04-Jul-2019					Open Universal Domain Description Language (Open UDDL)
Y	SOSA-ED.2.0-SNAP2	A	MOSS	SE	28-Feb-2024					Sensor Open Systems Architecture (SOSA)
Y	FACE-ED.3.2	A	MOSS	SE	02-Aug-2023					Future Airborne Capability Environment (FACE)

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Driving Standards: Standards and Specifications in the MOSS area in ASSIST

ASSIST: official source for specifications and standards used by the Department of Defense (DoD)

Adoption Notices in the MOSS area in ASSIST

- **Sensor Open Sensor Architecture (SOSA)
- **Future Airborne Capability Environment (FACE™)
- Open Universal Domain Description Language(Open UDDL)
- Common Payload Interface Standard – Command and Data Handling (CoPaIS)
- MOSA Payload Manager Interface Standard for COPaIS
- Vehicular Integration for Command, Control, Communication and Computers, Intelligence Surveillance, and Reconnaissance and Electronic Warfare (C4ISR/EW) Interoperability (VICTORY)

Administrative Notices being elevated to Adoption Notices

- Hardware Open Systems Technologies (HOST)
- Common Open Architecture Radar Programs (COARPs)
- Future Airborne Capability Environment (FACE™) **Already elevated**
- Red Hawk
- Sensor Open Sensor Architecture (SOSA) **Already elevated**
- Software Communication Architecture (SCA)
- Unmanned Systems (UXS) Control Segment (UCS)
- Space Systems Command (SSC) Common Payload Interface Standard (CoPaIS) **Already elevated**
- Open Mission Systems (OMS)
- Universal Armament Interface (UAI)
- All Source Position and Navigation (ASPN)
- Universal Command and Control Interface (UCI)
- Big Iron
- Weapon Open Systems Architecture (WOSA)

Publishing Standards to ASSIST helps programs identify standards that support MOSA development

Driving Standards: Standards and Specifications Coming to the MOSS area in ASSIST

Stds./Spcs. coming soon to the MOSS area in ASSIST

- Blue Force Tracking 3rd Generation (BFT3)
- Ground Combat Systems' Infrastructure Architecture (GCIA)
- Common Training Instrumentation Architecture (CTIA)
- Integrated Sensor Architecture (ISA)
- Modular Open Radio Frequency Architecture (MORA)
- Ground (RAS-G) Interoperability Profile (IOP)
- C5ISR/Electronic Warfare Modular Open Suite of Standards (CMOSS)
- Assured Position Navigation Reference Architecture (APNT RA)
- Training Simulation Software/Training Management Tools (TSS/TMT)
- Hardware Systems Technologies OpenVPX (HOST VITA)
- C5ISR/Electronic Warfare Modular Open Suite of Standards (CMOSS)

Publishing Standards to ASSIST helps programs identify standards that support MOSA development

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