Leveraging Standards And Technology In Support Of The Risk Management Framework:
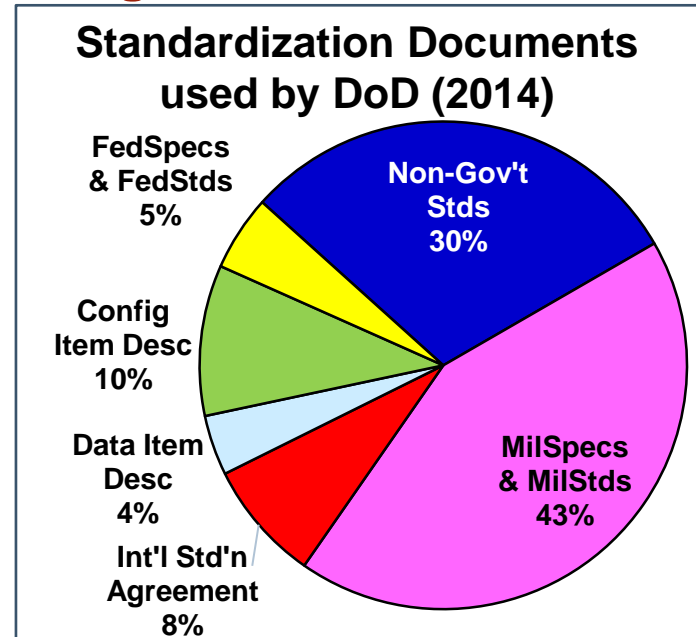
Transitioning to ISO / IEC / IEEE-15288:2015

Joseph P. Elm
Vice Chair, NDIA System Engineering Division
jelm@sei.cmu.edu

Background

DoD approach to standards has changed

- Acquisition Reform efforts cancelled tens of thousands of MilSpecs & MilStds

- Partially replaced with Non-Government Standards (NGS)

- DoD continues strong support of NGS, however
  - NGS must be contractually enforceable
  - NGS may not capture DoD req'ts

Standardization Documents used by DoD (2014)

- FedSpecs & FedStds 5%
- Config Item Desc 10%
- Data Item Desc 4%
- Int'l Std'n Agreement 8%
- Non-Gov't Stds 30%
- MilSpecs & MilStds 43%

A. Sedmak; "DoD SE and Acquisition Update". 08-Jul-2014

The significant industry investments made in various process methodologies (CMMI, AS9100, etc.) must be leveraged to ease migration to new NGS.

ISO/IEC/IEEE-15288:2015: System and software engineering – system life cycle processes

Establishes common framework of process descriptions for describing the life cycle of systems

- Facilitates communication among acquirers, suppliers and other stakeholders
- Defines Purpose, Outcomes, and Activities and Tasks for each process

ISO/IEC/IEEE 15288:2015 Processes

Agreement processes
- Acquisition
- Supply

Organizational project-enabling processes
- Life cycle model mg't
- Infrastructure mg't
- Portfolio management
- Human resource mg't
- Quality management
- Knowledge management

Technical management processes
- Project planning
- Project assessment and control
- Decision management
- Risk management
- Configuration management
- Information management
- Measurement
- Quality assurance

Technical processes
- Business or mission analysis
- Stakeholder needs and requirements definition
- System req'ts definition
- Architecture definition
- Design definition
- System analysis
- Implementation
- Integration
- Verification
- Transition
- Validation
- Operation
- Maintenance
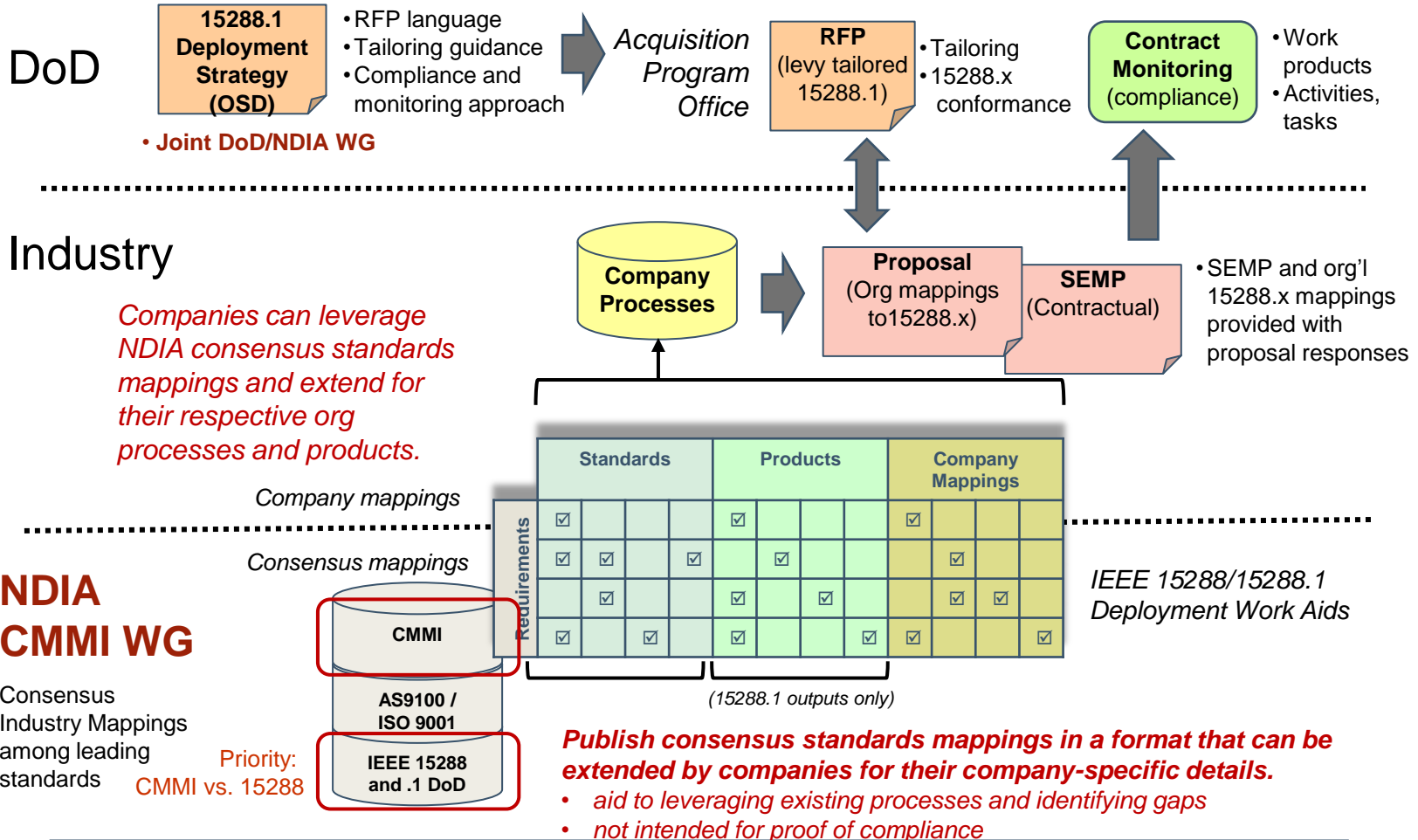- Disposal

15288 & DoD Acquisition

IEEE Std 15288.1-2015 - Standard for Application of Systems Engineering on Defense Programs

- Defines requirements for the application of ISO/IEC/IEEE 15288 to projects of the US DoD, including definition of "outputs" for each process
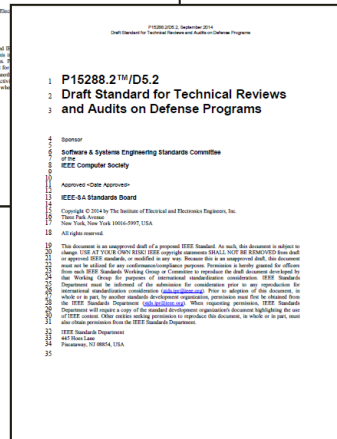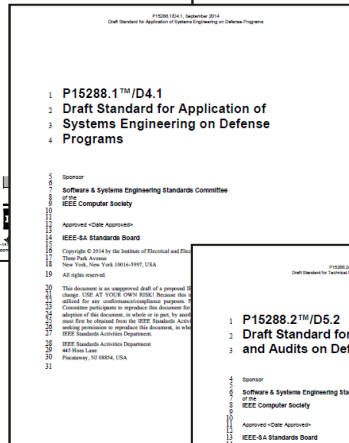
IEEE Std 15288.2-2015 - Standard for Technical Reviews and Audits on Defense Programs

- Elaborates the technical review and audit clause of ISO/IEC/IEEE 15288 to establish requirements for technical reviews and audits US DoD.
    - Includes definition, description, and intent, as well as the entry, exit and success criteria, for each technical review and audit
        - System Req'ts Review (SRR)
        - System Functional Review (SFR)
        - Preliminary Design Review (PDR)
        - Critical Design Review (CDR)
        - Test Readiness Review (TRR)
        - Functional Config. Audit (FCA)
        - System Verification Review (SVR)
        - Production Readiness Review (PRR)
        - Physical Configuration Audit (PCA)
        - Software Req'ts and Arch. Review (SAR)
        - Software Specification Review (SSR)
        - Integration Readiness Review (IRR)
        - Flight Readiness Review (FRR)

Conops – IEEE Std 15288.1 Deployment Strategy & Integrated Standards Mappings in Acquisition

DoD

15288.1 Deployment Strategy (OSD)
- RFP language
- Tailoring guidance
- Compliance and monitoring approach

Acquisition Program Office

RFP (levy tailored 15288.1)
- Tailoring
- 15288.x conformance

Contract Monitoring (compliance)
- Work products
- Activities, tasks

• **Joint DoD/NDIA WG**

Industry

Companies can leverage NDIA consensus standards mappings and extend for their respective org processes and products.

Company Processes

Proposal (Org mappings to15288.x)

SEMP (Contractual)

- SEMP and org'l 15288.x mappings provided with proposal responses

Company mappings

Consensus mappings

Requirements	Standards			Products			Company Mappings		
	☑			☑			☑		
	☑	☑		☑	☑			☑	
		☑			☑	☑		☑	☑
	☑		☑	☑		☑	☑		☑

(15288.1 outputs only)

IEEE 15288/15288.1 Deployment Work Aids

NDIA CMMI WG

Consensus Industry Mappings among leading standards

CMMI

AS9100 / ISO 9001

IEEE 15288 and .1 DoD

Priority: CMMI vs. 15288

Publish consensus standards mappings in a format that can be extended by companies for their company-specific details.
- *aid to leveraging existing processes and identifying gaps*
- *not intended for proof of compliance*

Mappings Under Development
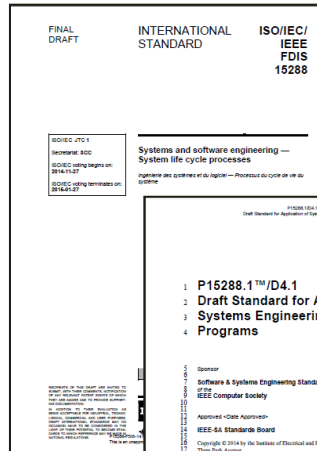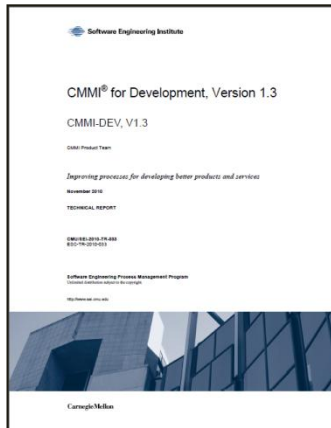
- **CMMI-DEV v1.3**
- **ISO/IEC/IEEE 15288**
- **IEEE Std 15288.1**
- **IEEE Std 15288.2**
- **AS9100C**

DoD Guidance for 15288 [1]

RFP Language Guidance

- Provides sample language to invoke effective utilization of ISO/IEC/IEEE 15288, IEEE Std 15288.1, and IEEE Std 15288.2
  - Language for RFP Section C - Statement of Work (SOW)
  - Language for RFP Section L - Instructions to Bidders
  - Language for RFP Section M - Evaluation criteria

DoD Guidance for 15288 2
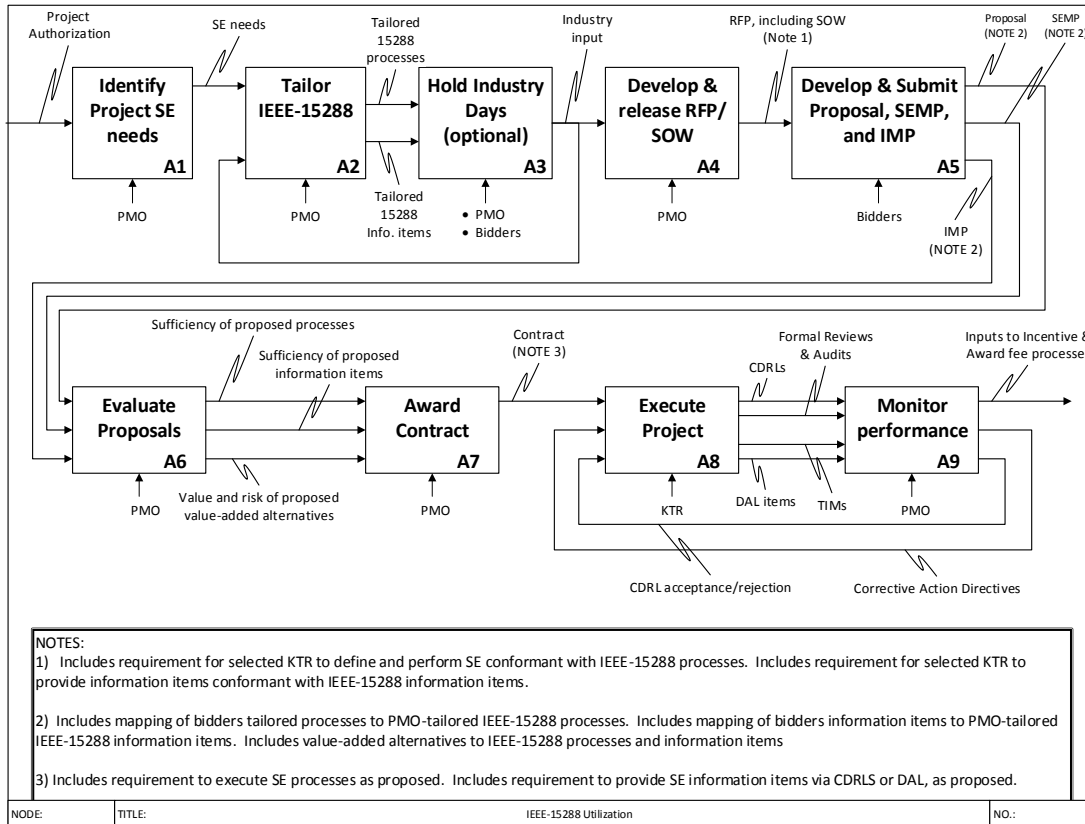
Tailoring Guidance

- Provides guidance on tailoring to enable the accrual of benefits from the standard, while controlling the impact of implementing the standard
  - Program Office tailoring prior to the issuance of the RFP
  - Contractor tailoring during the proposal effort
    – To satisfy the Program Office's requirement for conformance to ISO/IEC/IEEE-15288:2015 and IEEE Std 15288.1/.2
    – To align established organizational processes with those of the standard
    – To suit the point-specific solution that they are offering

DoD Guidance for 15288 3

Conformance and Compliance Guidance

- RFP requires conformance to ISO/IEC/IEEE-15288, IEEE Std 15288.1 and IEEE Std 15288-2 as tailored by PMO

- Contractor proposes org'l processes, information items, and reviews (PIA&R) and shows mapping to 15288.1/.2 PIA&R

- PMO evaluates proposed PIA&R for conformance to 15288.1/.2

- PMO awards contract, including obligation to perform proposed processes and reviews, and provide proposed information items

- Contractor executes project per contract, executing processes and reviews and producing information items

- PMO evaluates 15288 compliance during TIMs and via proposed information items received via CDRL or DAL
  - Focus is on evaluation via outcomes and outputs rather than conformance to tasks

DoD Guidance for 15288 4

IEEE-15288 Conformance and Compliance Guidance (cont'd)

NOTES:
1) Includes requirement for selected KTR to define and perform SE conformant with IEEE-15288 processes. Includes requirement for selected KTR to provide information items conformant with IEEE-15288 information items.

2) Includes mapping of bidders tailored processes to PMO-tailored IEEE-15288 processes. Includes mapping of bidders information items to PMO-tailored IEEE-15288 information items. Includes value-added alternatives to IEEE-15288 processes and information items

3) Includes requirement to execute SE processes as proposed. Includes requirement to provide SE information items via CDRLS or DAL, as proposed.

| NODE: | TITLE: | IEEE-15288 Utilization | NO.: |

Status

15288 – CMMI Mapping

0%   100%

- EDC = May-2015

15288 – AS9100 Mapping

0%   100%

- EDC = Jun-2015

RFP Language Guidance

0%   100%

- EDC = May-2015

Tailoring Guidance

0%   100%

- EDC = May-2015

Conformance/Compliance Guidance

0%   100%

- EDC = May-2015

Thank You

Contact information

Joseph P. Elm
412-268-9132
jelm@sei.cmu.edu