DoD Systems Engineering Update

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Principal Deputy, Office of the Deputy Assistant Secretary of Defense for Systems Engineering (ODASD(SE))

NDIA Systems Engineering Division Strategic Planning Meeting
December 9, 2015

DASD, Systems Engineering

DASD, Systems Engineering
Stephen Welby
Principal Deputy *Kristen Baldwin*

Homeland Defense Capability Development
Robin Hicks

Major Program Support
James Thompson

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**

Engineering Enterprise
Robert Gold

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

FY 2015 DASD(SE) Goals

- **Continue excellence in Engineering support to programs and acquisition decisions to include improving focus on technical risk management**

- **Provide consistent Program Protection engagement with programs resulting in successful vulnerability mitigation strategies, improve system security engineering engagement and support to programs, standup the Joint Federated Assurance Center, and implement data protection activities**

- **Advocate for and ensure adequate DoD Engineering Workforce capacity and capability, and enhance STEM engineering activities**

- **Launch and/or support BBP 3.0 implementation plans for organic workforce capability, managing technical risk, increasing technology insertion opportunities, and modular open systems architectures; and protection of unclassified technical data**

- **Support R&E on critical engineering research and prototyping investments**

- **Refine and implement processes to oversee Acquisition of Engineering and Technical Services**

- **Support Defense Innovation Initiative, lead Department-wide Long Range Research and Development Program Plan, support ASD(R&E) initiatives and support several Defense Science Board study efforts**

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FY 2015 DASD(SE) Accomplishments

- **Performed rigorous engineering oversight of 50 programs including SEP and PPP development and approval, reliability, PDR/CDR, PSA**

- **Published DoD Risk, Issue, and Opportunity Management Guide for Defense Acquisition Programs**

- **Supported publication and adoption of non-government standards for systems engineering, technical reviews, configuration management, and manufacturing management**

- **Stood up Joint Federated Assurance Center (JFAC)**

- **Supported major BBP 3.0 activities in cybersecurity and data protection, MOSA, technical risk, engineering workforce, and engineering technical services**

- **Conducted efforts with the Services, industry and other agencies to establish digital model-centric engineering concepts**

- **Studied technical standards and approaches for implementing Modular Open Systems Approaches in acquisition programs**

- **Reinvigorated the DoD-DHS Capability Development Working Group focused on co-development of technologies to address critical inter-agency homeland defense capability shortfalls**
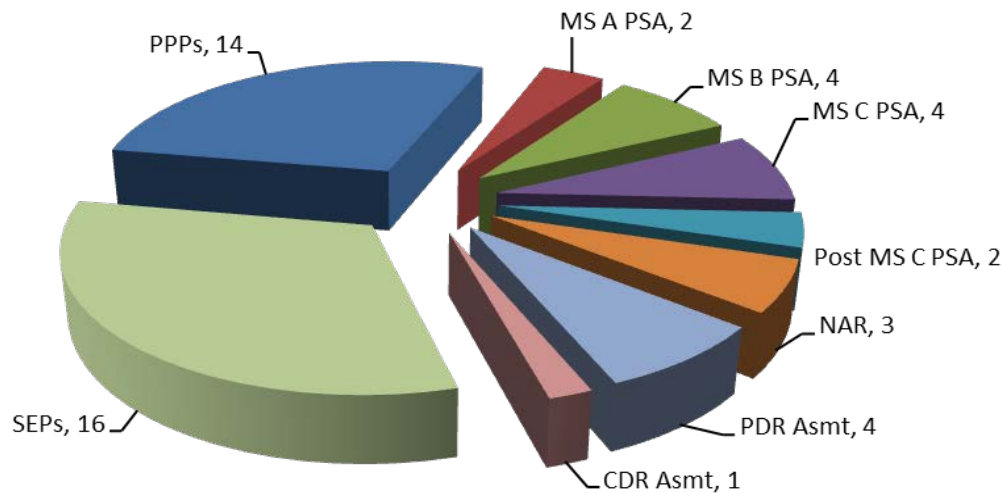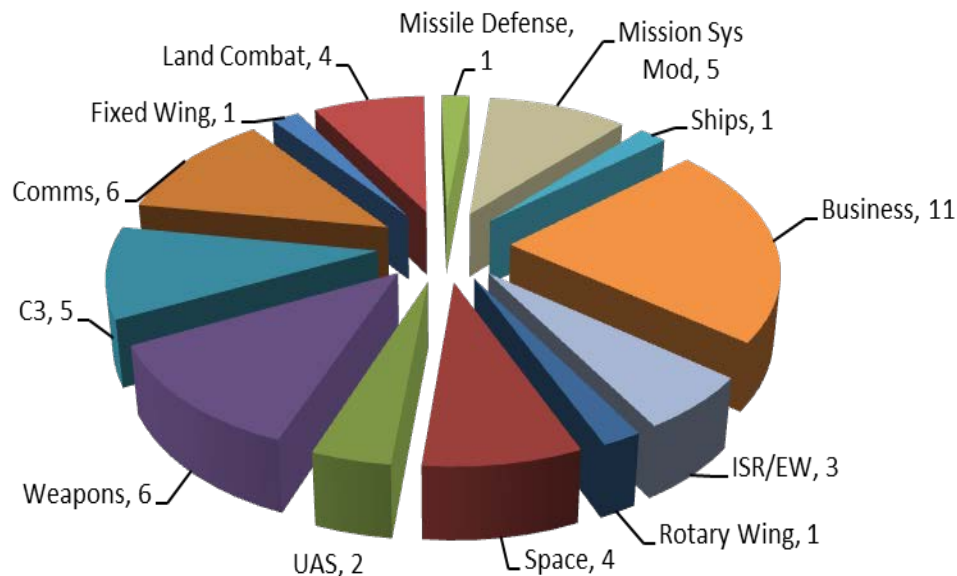
Fiscal Year 2015

- **Program Support Assessments: 12**
- **Non-Advocate Reviews: 3**
- **PDR/CDR Assessments: 5**
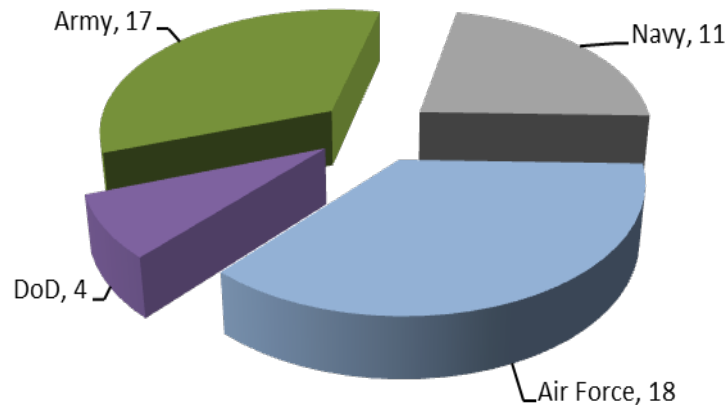- **SEP Approvals: 16**
- **PPP Approvals: 14**

Decision Support Reviews

- PPPs, 14
- MS A PSA, 2
- MS B PSA, 4
- MS C PSA, 4
- Post MS C PSA, 2
- NAR, 3
- PDR Asmt, 4
- CDR Asmt, 1
- SEPs, 16

Domain

- Missile Defense, 1
- Mission Sys Mod, 5
- Ships, 1
- Business, 11
- ISR/EW, 3
- Rotary Wing, 1
- Space, 4
- UAS, 2
- Weapons, 6
- C3, 5
- Comms, 6
- Fixed Wing, 1
- Land Combat, 4

Military Department

- Army, 17
- Navy, 11
- Air Force, 18
- DoD, 4

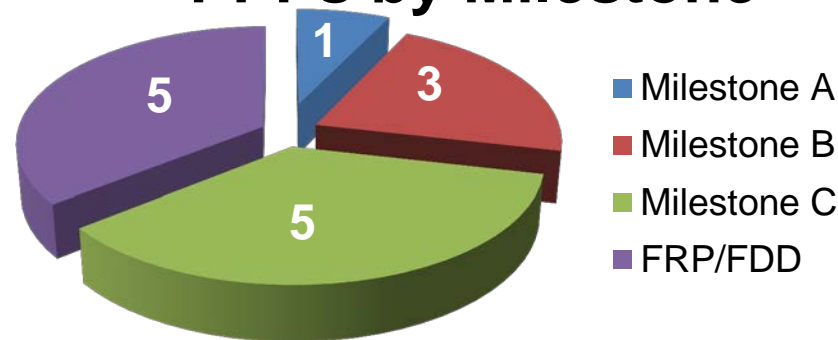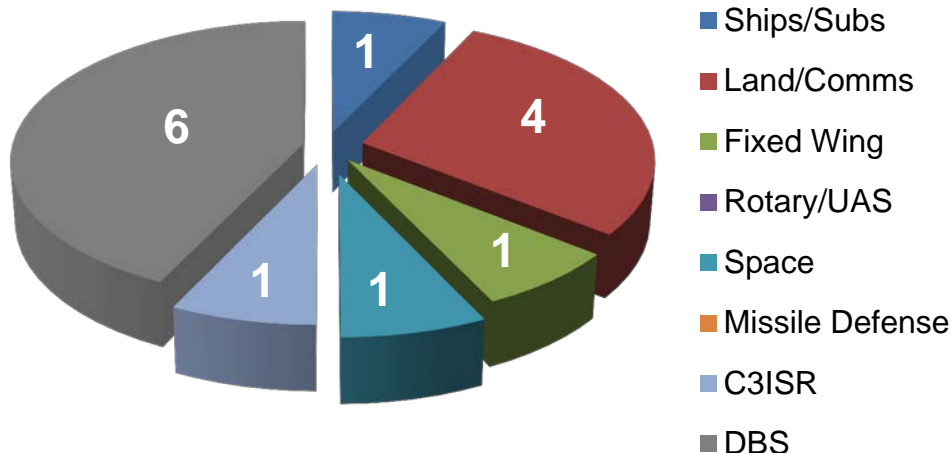# FY 2015 Program Protection Engagement and Support Summary

63 PPPs Approved

FY 2010 – 4	FY 2013 – 18
FY 2011 – 7	FY 2014 – 18
FY 2012 – 5	FY 2015 – 14

PPPs by Milestone
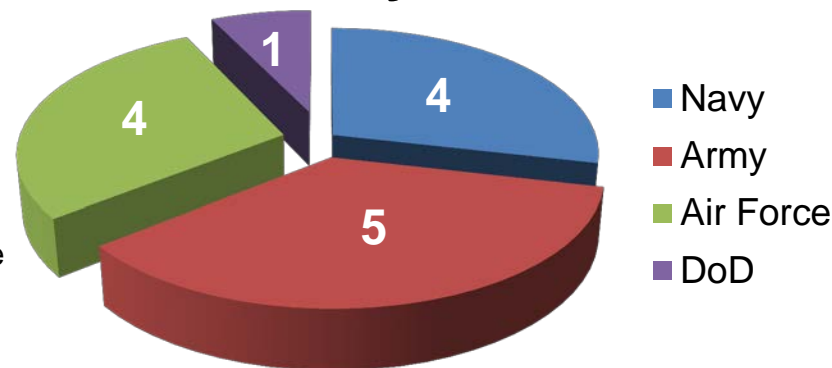
- Milestone A
- Milestone B
- Milestone C
- FRP/FDD

PPPs by Domain

- Ships/Subs
- Land/Comms
- Fixed Wing
- Rotary/UAS
- Space
- Missile Defense
- C3ISR
- DBS

PPPs by Service

- Navy
- Army
- Air Force
- DoD

Engaged with and tracked 50 programs during FY 2015

Vision for Defense Engineering

Persistent learning organization…talented engineering leadership…advanced tools and methods that enable deep analysis for informed decisions…solutions that are well designed, can adapt, and are secure, sustainable, and affordable

People — **Processes, Tools & Techniques** — **Products**

People

STEM Engineering	• **Expand SE Capstone Program to be a broad DoD, Industry, University Initiative** • **Promote the "E" in DoD STEM programs**
Organic Engineering	• **Identify critical technical capabilities for the organic workforce** • **Establish just-in-time delivery of technical training and education to complement existing acquisition training** • **Baseline and track advanced engineering degree programs for uniformed and civilian engineers**

Initiatives and Outcomes

Digital Engineering Design (DED)	• Pilot digital artifacts in program acquisition • Finalize the digital engineering data taxonomy
Engineering Enterprise	• Measure and recognize performance of Component Engineering Centers • Provide DoD-wide access to commonly-used engineering standards

Modular, Open Systems	• **Construct MOSA guidance to achieve tailored product goals** • **Mature and disseminate MOSA standards, support program implementation**
Resilient Systems	• **Establish Joint Federated Assurance Center as primary HW/SW assurance resource for programs** • **Integrate intelligence and acquisition sources for proactive protection of technical information** • **Establish cyber resilient engineering policy, guidance and design standards**

Opportunities for DoD and Industry Collaboration

- **Contribute to development of engineering standards for cyber resilient systems**

- **Transition microelectronics design and evaluation tools**

- **Share intelligence, counterintelligence, and law enforcement analysis for more proactive protection of critical information**

- **Identify and address gaps in modular, open standards**

- **Pilot and transition engineering resilient systems (ERS) technologies**

- **Monitor advanced manufacturing institutes for opportunities to advance SE processes, tools, and techniques**

- **Partner to establish a broad Capstone Program to improve systems education in engineering degrees**

Technical Excellence End State

- **Improved organic engineering workforce capability and environment**

- **Efficient processes; maturing data and growing knowledge over time**

- **Enhanced communication with industry throughout requirements, design, manufacturing, and sustainment**

- **Affordable systems achieving near- and far-term dominance**

Systems Engineering:
Critical to Defense Acquisition

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

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