DHS SCIENCE AND TECHNOLOGY

DHS Systems Engineering Acquisition Challenges and Issues

Homeland Security
Science and Technology

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The DHS Acquisition Portfolio

111 Major Programs representing >$100B investment

Diverse Products and Approaches

- Ships
- Aircraft
- IT business systems
- Facilities
- Command and control
- Sensor/detectors

Most involve Large Complex Enterprise IT Mission Services

Performed by DHS Operating Components and HQ organizations

Office of Systems Engineering (OSE)

Mission

Maximize the effectiveness of capabilities and technologies delivered by DHS Acquisition and R&D programs through:

- Systems Engineering Policy
- Systems Engineering Technical Guidance and Assistance
- Systems Engineering Training
- Technical Assessments

Vision

Consistent and appropriate implementation across DHS of:

- DHS Systems Engineering Life Cycle (SELC)
- S&T Capability Development Framework (CDF)
- Systems Engineering Principles

DHS SE Acquisition Policy and Guidance

SE Certified Acquisition Workforce – Developed Acquisition Certification Policy for Systems Engineering, with DHS Operating Components & Acquisition Workforce Division

Signed by Deputy Under Secretary for Management 04/06/2012

SELC Instruction – Teamed with PARM & CIO to develop and adjudicate comments

Signed by Deputy Under Secretary for Management 11/05/2015

SELC Guidebook – Led rewrite

Signed by Deputy Under Secretary for Management 4/18/2016

Developed four SELC Supplemental Guidance documents

SELC Tailoring Examples Independent Verification and Validation

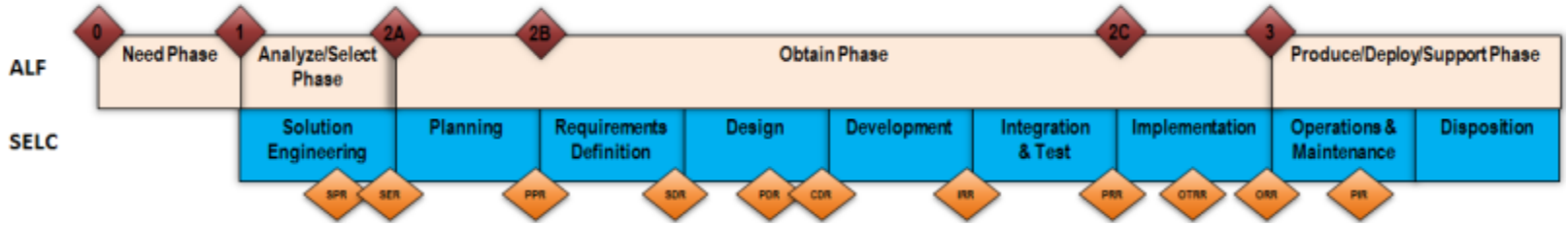
Technical Review Guide Design Considerations

SELC Outreach – Led Department-wide initiative to increase understanding and acceptance of new DHS SELC

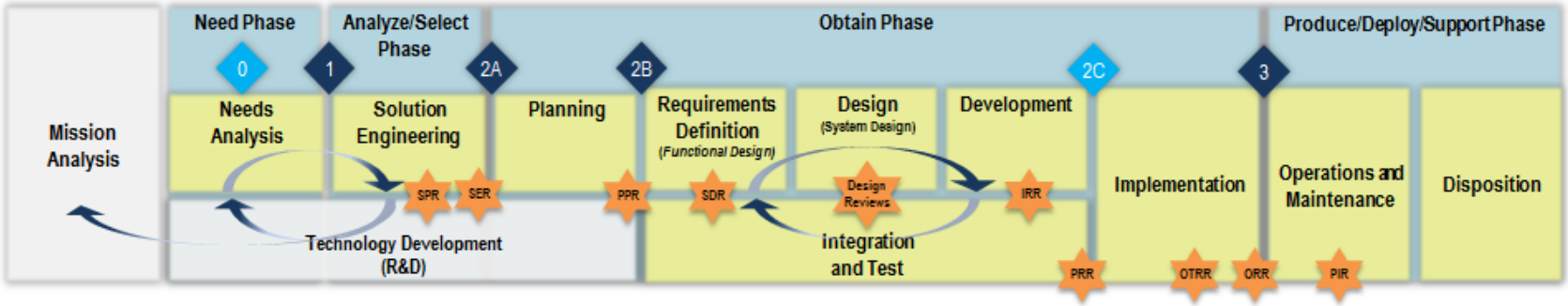
- *Executive-level briefing to key stakeholder groups*
- *In-person practitioner briefings at major DHS components*

Policy – Systems Engineering Life Cycle (SELC)

Former



New



SELC Technical Reviews

- SPR: Study Plan Review
- SER: Solution Engineering Review
- PPR: Project Planning Review
- SDR: System Definition Review
- Design Reviews: Preliminary Design Review and Critical Design Review
- IRR: Integration Readiness Review
- PRR: Production Readiness Review
- OTRR: Operational Test Readiness Review
- ORR: Operational Readiness Review
- PIR: Post Implementation Review

Legend

- Event-Based SELC Technical Review
- Acquisition Life Cycle Framework (ALF) Acquisition Decision Event
- ALF Conditional Acquisition Decision Event
- ALF Phase
- SELC Activity
- Other DHS Activity

DHS SE Acquisition Policy and Guidance – Technical Assessments

Secretary Johnson, Memo:

Establishment of Integrated Product Teams, 25 August 2015

"S&T will conduct a system engineering review and technology assessment of the technical solutions in DHS major acquisition programs and provide a report to the Chief Acquisition Officer and Joint Requirements Council…"

Modifications to Acquisition Directive 102-01-001

Conducting Independent technical assessment: *"Provide relevant information on the technical maturity of the technology, an evaluation of manufacturing capability, and an overview of technical risk."*

Technical Assessment Directive and Instruction

- Formalizes DHS Independent Technical Assessment Process
- Waiting for Under Secretary for Management Signature

Technical Assessments
Primary Customers and Goals

Acquisition and S&T Program Managers: Assist in identifying and addressing technical risks/issues

Acquisition and S&T Decision-Makers: Enable informed acquisition or R&D decisions based on independent and objective technical data

DHS S&T Integrated Product Teams: Help identify and communicate potential R&D investment areas

Joint Requirements Council: Support JRC Feasibility Assessment (as part of JRIMS validation activities)

Technical Assessment Scope

Technology Maturity

Technologies are feasible and sufficiently mature such that the selected technical solution can be delivered within the scope of the Acquisition Program

- Clear, Achievable, Traceable, Right level for acquisition approach, and addressing complete solution space (Operational, Physical, Cyber, Environmental)

Completeness/quality of individual and combined technologies within selected technical solution

Manufacturing Maturity

The general ability of Industry partners to manufacture solution at the volume required to meet the operational need (early in the Acquisition process)

The specific ability of the selected vendors to manufacture the production representative solution at volume (later in the Acquisition process)

Technical Risk Assessment

Assessment of the technical (vice business) risks - Risk mitigation actions associated with developing and integrating technology(ies)

- Challenges related to maturing any technology(ies) for a specific application within the scope of the acquisition program
- Challenges related to developing and integrating technology(ies) into a solution that meets requirements
- Ensuring requirements are clear, achievable, traceable, at the appropriate level for the selected technical solution and the chosen acquisition approach, and address the complete solution space
- Challenges related to transitioning to new IT infrastructures, cloud migration, data management, and migration
- Acquisition Review Board special interest items such as, but not limited to, suitability and cybersecurity
- Quality of the applicable SE processes that are necessary to implement the programs tailored systems engineering approach

Technical Assessment Summary

Independent Reviews of the Technical Aspects of a Program

Criteria is based on sound Systems Engineering Principles and Practices as described in the SELC

Emphasis is on technical rigor and quality

Do not provide “go – no go” recommendations

- Document and Report on Technical Risk

Risks are natural elements of acquisition programs

High Risks are not bad, as long as strong mitigation plans are in place

Conclusion

- DHS enterprise has a wide range of mission areas
- DHS has a civilian/law enforcement culture
- Acquisition still somewhat synonymous with procurement
- DHS realizes Systems Engineering needs to be institutionalized and is improving it across the Department
- Stood up Level I,II, & III SE Certification program
- Developed rigorous SELC Guidance
- Implementing Technical Assessments for Major Acquisition Programs
- Looking to continue collaboration

Back-up

Major DHS Operating Components

- Transportation Security Administration (TSA)
- U.S. Coast Guard (USGC)
- U.S. Secret Service (USSS)
- U.S. Customs and Border Protection (CBP)
- U.S. Citizenship and Immigration Service (CIS)
- U.S. Immigration and Customs Enforcement (ICE)
- Federal Emergency Management Agency (FEMA)
- Domestic Nuclear Detection Office (DNDO)
- National Protection and Programs Directorate (NPPD)

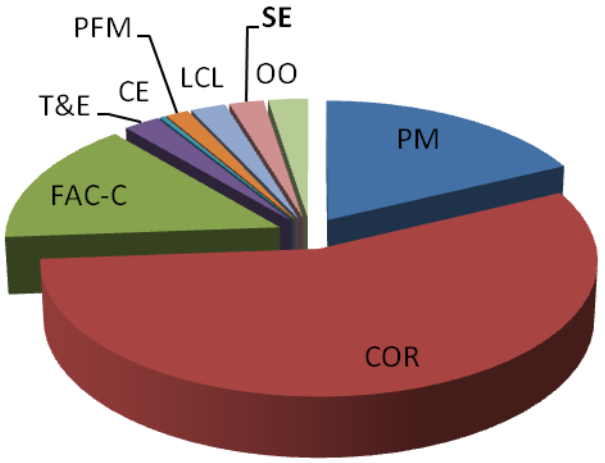
Systems Engineering Workforce

Establish a professional certification program to train and develop our workforce and provide mandatory education, training, and experience requirements for each specific acquisition position and specialty

- Developed DHS Acquisition Certification Policy for SE
- Lead revision of SE certification courses to reflect new DHS SELC Instruction and revised SELC Guidebook
- Teaching SE certification courses

  Systems Engineering 201 (10/24/2016 and 12/12/2016)

  Systems Engineering 301 (11/14/2016)



Improving DHS Systems Engineering Acquisition Policy and Guidance

New Systems Engineering Lifecycle (SELC) Guidebook:

- Increases emphasis on up-front planning
- Encourages tailoring
- Increases emphasis on “activities,” not artifacts and policy
  - Executing activities that lead to solutions, not focusing on development of documents
- Provides detailed supplemental guidance
- Adds Technology Development to Systems planning