DHS Systems Engineering Acquisition Challenges and Issues

18th Annual National Defense Industrial Association (NDIA)
26 October 2015

Kerry D. Wilson
Systems Engineer
Office of Systems Engineering
Science and Technology Directorate
DHS Challenges

- The GAO and DHS Inspector General identify the following issues:
  - Gaps in developing capability and acquisition program requirements
  - Initiating acquisition activities without component or department approval of documents essential to planning acquisitions
  - Not incorporating information on costs and benefits in making technology acquisition decisions or establishing acquisition program baselines
  - Projects allowed to progress without proper acquisition review or without adequate front-end analysis
  - No policy for coordinating Systems Engineering (SE) processes nor established mechanisms for sharing lessons learned across components.

- Better program oversight, governance, and control at component and department level is needed to remedy the issues affecting the DHS portfolio.
DHS Secretary’s Unity of Effort Priority

In April 2014, Secretary Johnson instituted the “Strengthening Departmental Unity of Effort” designed to address these challenges

- Establish a component-driven joint requirements process to
  - Identify and prioritize capability gaps and overlaps in capability
  - Ensure proposed solutions are feasible technical alternatives
- Review and improve the DHS Acquisition Oversight and Processes to
  - Improve the integration of strategy and acquisition planning
  - Development of joint requirements

In August 2015, Secretary Johnson issued a memo establishing DHS Integrated Product Teams and directing DHS S&T to conduct systems engineering reviews and technical assessments of major acquisitions

- Assist programs in planning, executing and managing technical activities and risks
- Inform acquisition decision-making based on independent and objective technical information
- Advise S&T IPTs of potential R&D opportunities

Technical Assessments will be conducted to aid the programs and help overcome challenges
Conduct independent program reviews to determine the level of risk in five technical areas and the risk of overall program.

### Technology Maturity
- CTEs identified
- CTE maturity
- Activities required to reach full maturity
- Risks to practical maturation

### Requirements
- Right requirements (e.g., operational and suitability)
- Threats (e.g., physical, cyber, environmental) defined
- Traceability
- Stability, clarity, and achievability
- Engineer to test

### Software/IT Systems
- Business process defined
- Alignment with EA
- Incremental delivery schedule
- Development metrics and processes

### Manufacturing
- Maturity of processes & facilities
- Quality Control

### Design/Development
- Interface definition & control practices
- Integration challenges
- Interoperability challenges
- IT/Cyber Security Attack Space Definition
- Cyber risks and mitigation strategies
Technical Assessment Benefits

- **Program Manager** –
  - Identification of previously unknown risks earlier in the life cycle
  - Assistance in developing/refining mitigation plans
  - Ensuring that appropriate technical activities and events have been planned
  - Guidance when conducting technical activities and events

- **Acquisition Decision-Makers** –
  - More informed decision-making that is based on independent and objective technical information throughout the acquisition life cycle

- **DHS R&D Organizations** –
  - Information on the technical maturity of technologies in specific applications
  - Identification of specific areas where technologies are immature and do not meet mission and/or operational needs
When are Technical Assessments Conducted?

<table>
<thead>
<tr>
<th>ALF Phase</th>
<th>Technical Assessment Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need Phase</td>
<td>• Technical feasibility&lt;br&gt;• R&amp;D opportunities</td>
</tr>
<tr>
<td>Analyze / Select Phase</td>
<td>• Technical maturity&lt;br&gt;• Technology maturation/integration approach&lt;br&gt;• Sound requirements and trade-off analysis&lt;br&gt;• R&amp;D opportunities</td>
</tr>
<tr>
<td>Obtain Phase</td>
<td></td>
</tr>
<tr>
<td><strong>After an ADE-2A decision and Planning activities have been completed:</strong></td>
<td>• Design/Development technical risks&lt;br&gt;• Technology maturation/integration progress</td>
</tr>
<tr>
<td><strong>Prior to an ADE-2C decision (Low-Rate Initial Production or Incremental Release decision)</strong></td>
<td>• Manufacturing readiness&lt;br&gt;• Production readiness</td>
</tr>
</tbody>
</table>
Technical Assessment

Key Participants

- S&T Chief Scientist
- S&T Office of Systems Engineering
- S&T IPTs
- S&T Office of Test and Evaluation
- PARM
- Component Program Office (Program Manager and Technical Staff)
- Subject Matter Experts (e.g., S&T HSARPA, FRG, RDP, CDS, National Labs)
- OCIO
Technical Assessment Process (How)

Key Tenets:

- **Assist** program in planning for and delivering technically sound solutions
- **Minimize impact** to program
- **Early and continuous engagement** with program
- Consistency and transparency through objective evaluation criteria
Summary

- S&T Led Technical Assessments will be conducted to aid DHS Acquisition Programs in overcoming challenges based on ‘Unity of Effort Priority’

- 5 Technical Assessment Areas
  - Technology Maturity
  - Requirements
  - Software/IT Systems
  - Manufacturing
  - Design/Development

- Key Benefits
  - Program Manager
  - Acquisition Decision-Makers
  - DHS R&D Organizations