# DHS Systems Engineering

## 15th Annual Systems Engineering Conference

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# DHS History

- September 11, 2001: Terrorists attack the United States
- October 8, 2001: President George W. Bush creates the White House Office of Homeland Security
- November 19, 2002: Congress passes legislation mandating the Department of Homeland Security
- November 25, 2002: President Bush signs the Homeland Security Act into law
- January 24, 2003: The department becomes operational
- March 2, 2003: The majority of previously existing agencies transfer to the Department of Homeland Security

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# Who became part of DHS?

- U.S. Customs Service (Treasury)
- Immigration and Naturalization Service (Justice)
- Federal Protective Service
- Transportation Security Administration (Transportation)
- Federal Law Enforcement Training Center (Treasury)
- Animal and Plant Health Inspection Service (partial, Agriculture)
- Office for Domestic Preparedness (Justice)
- Federal Emergency Management Agency
- Strategic National Stockpile and the National Disaster Medical System (Health and Human Services)
- Nuclear Incident Response Team (Energy)
- Domestic Emergency Support Teams (Justice)
- National Domestic Preparedness Office (FBI)
- U.S. Secret Service (Treasury)
- U.S. Coast Guard (Transportation)

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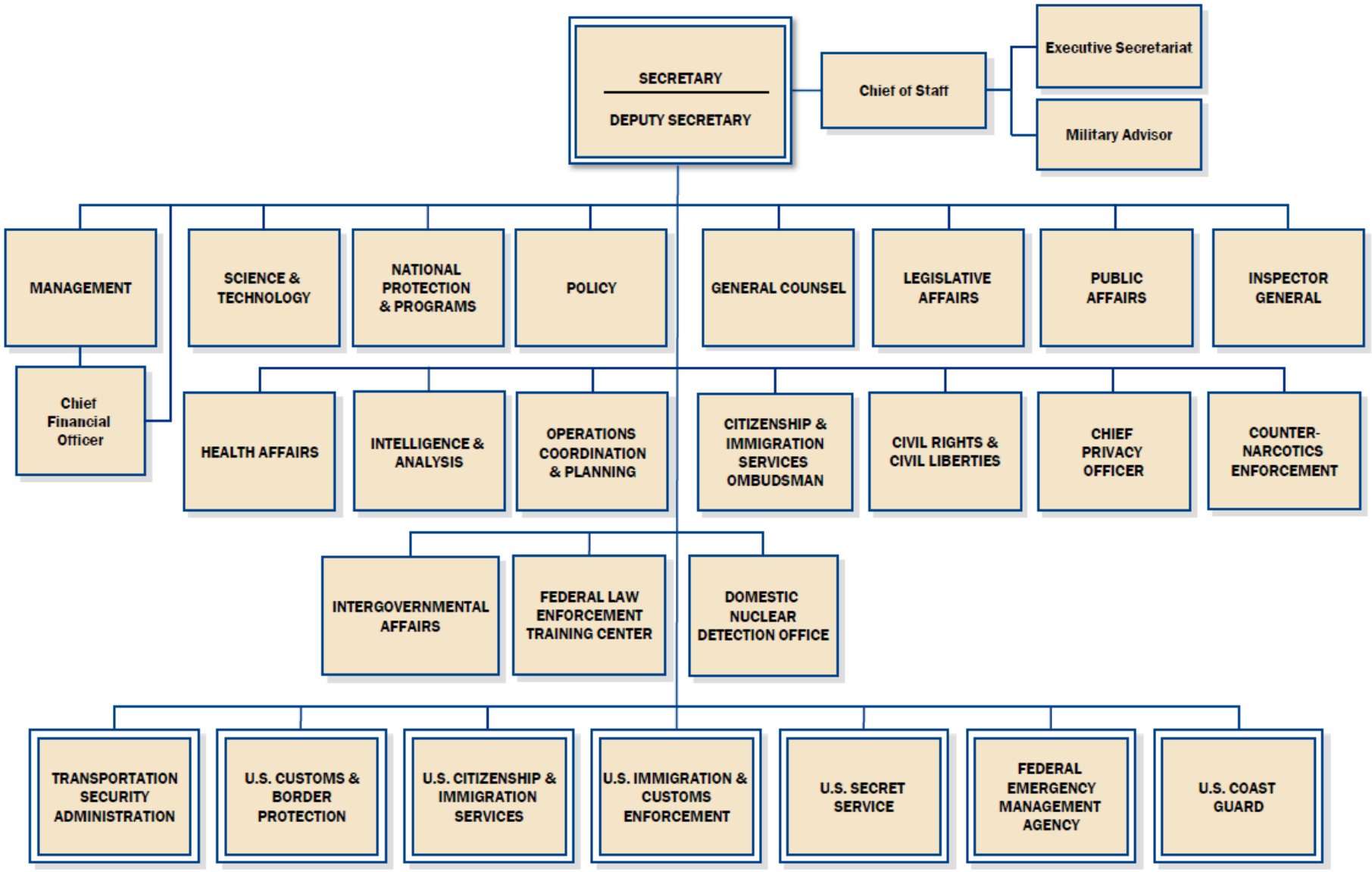


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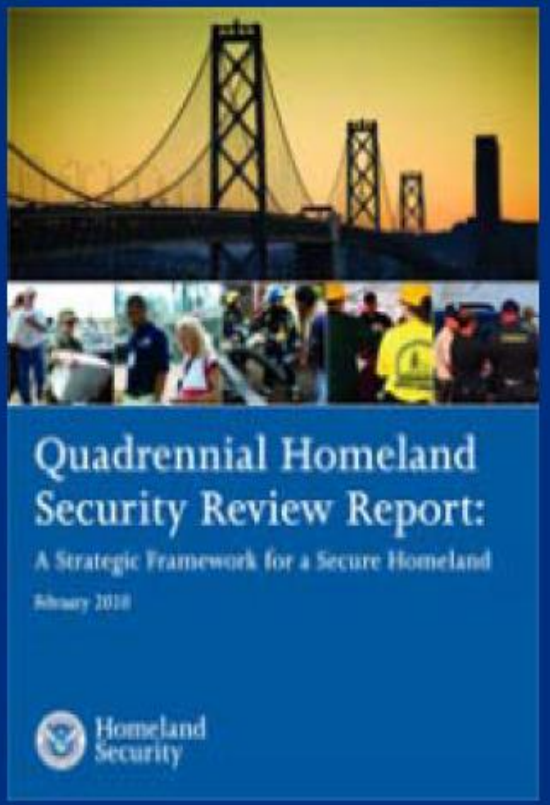
# DHS Core Mission Areas

- Preventing Terrorism and Enhancing Security
- Securing and Managing our Borders
- Enforcing and Administering our Immigration Laws
- Safeguarding and Securing Cyberspace
- Ensuring Resilience to Disasters

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# The Homeland Security Enterprise

- Homeland security is larger than just DHS.
  - *Law enforcement*
  - *First responders*
  - *Private sector*
  - *Communities, Families and Individuals*


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# Challenges in Applying DoD Solutions at DHS

| DoD | | DHS |
|---|---|---|
| Homeland Defense mission | ⟺ | Homeland Security mission |
| Military/warfighting culture | ⟺ | Law enforcement culture |
| Rules of Engagement | ⟺ | Domestic Civil Rights & Liberties |
| Culture of training | ⟺ | Little opportunity for training |
| Lethal force | ⟺ | Non-lethal force |
| $$$ | ⟺ | $ |

**Differences can result in difficulty infusing military technology and equipment into the operational work of DHS Components and first responders …**

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# Thinking Enemies: Evolution of Terrorist Attacks in Aviation

| Time | Event/Threat | Vulnerability | Response |
|---|---|---|---|
| 1970s | Hostage/Hijacking | Guns, weapons | Magnetometers |
| 1988 | Pan Am 103, Lockerbie | Bomb in baggage | Baggage scans |
| Sept. 2001 | WTC, PA, Pentagon | Box cutters, etc | TSA |
| Dec. 2001 | Richard Reid | Shoe bomb | Shoes removed |
| 2004 | Chechen suicide attacks | Vests | Pat downs, backscatter |
| 2006 | Heathrow liquids plot | Novel liquid bomb | Liquids ban |
| 2009 | Non-metallic body bomb | Body bomb in sensitive area | ETD, WBI, pat down |
| 2010 | Printer cartridge bombs | Explosives packed in cargo | Trace detection for cargo |

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# Deepwater Horizon

Sources: Reuters, Wikimedia Commons

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# Three Near-Simultaneous Disasters


Magnitude 9.0

*Sources: AP, Reuters*

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# Complex Systems Fail Complexly

**"In complex industrial, space, and military systems, the normal accident generally (not always) means that the interactions are not only unexpected, but are *incomprehensible* for some critical period of time."**

**–Charles Perrow, *Normal Accidents*, 1984**

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# The DHS Acquisition Portfolio

- 135 Major Programs representing > $150B investment
- Significant Diversity (Products and Approaches)
  - Products include ships, aircraft, IT business systems, facilities, command and control, sensor/detectors,
  - Approaches include full development / production, Commercial Off the Shelf (COTS) integration, commodity purchase, and mission / mission support services.
- Acquisition is performed by DHS Operating Components and some HQ organizations

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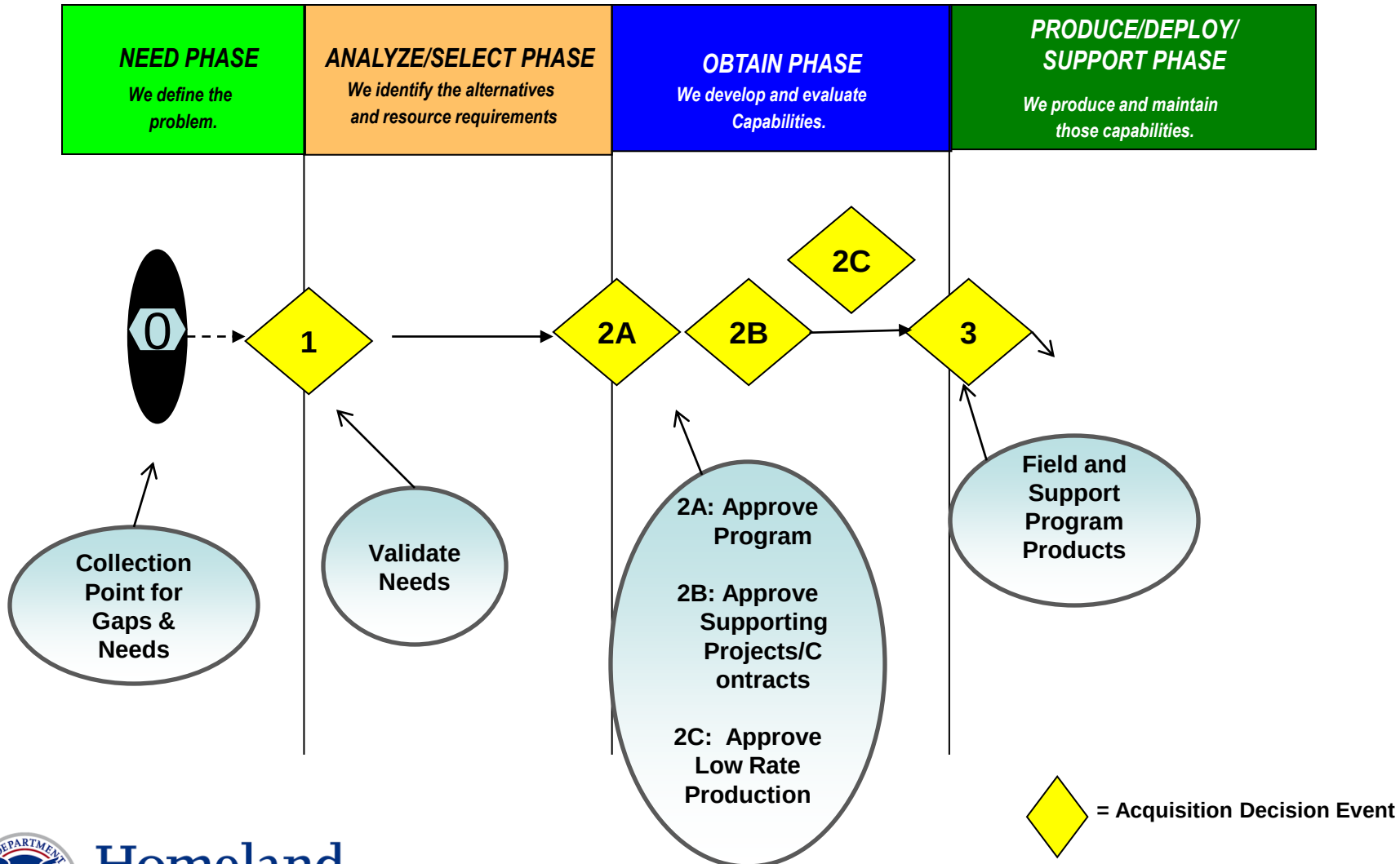
# DHS Acquisition Life Cycle Framework (ALC)

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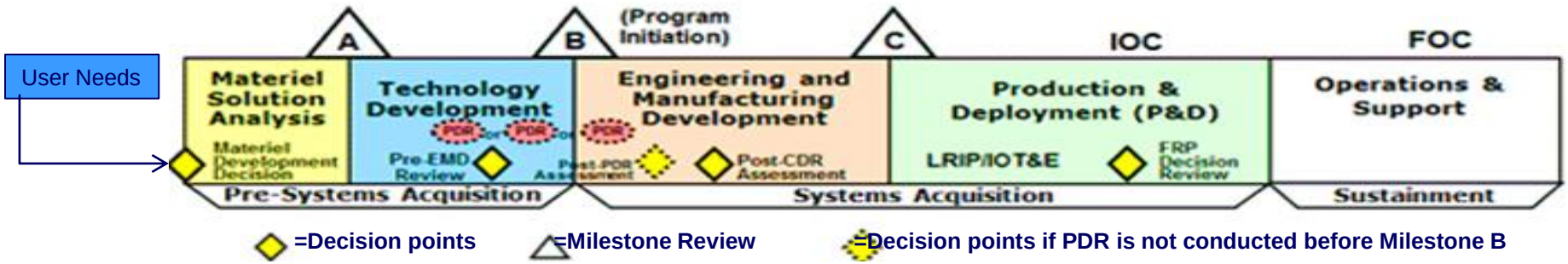
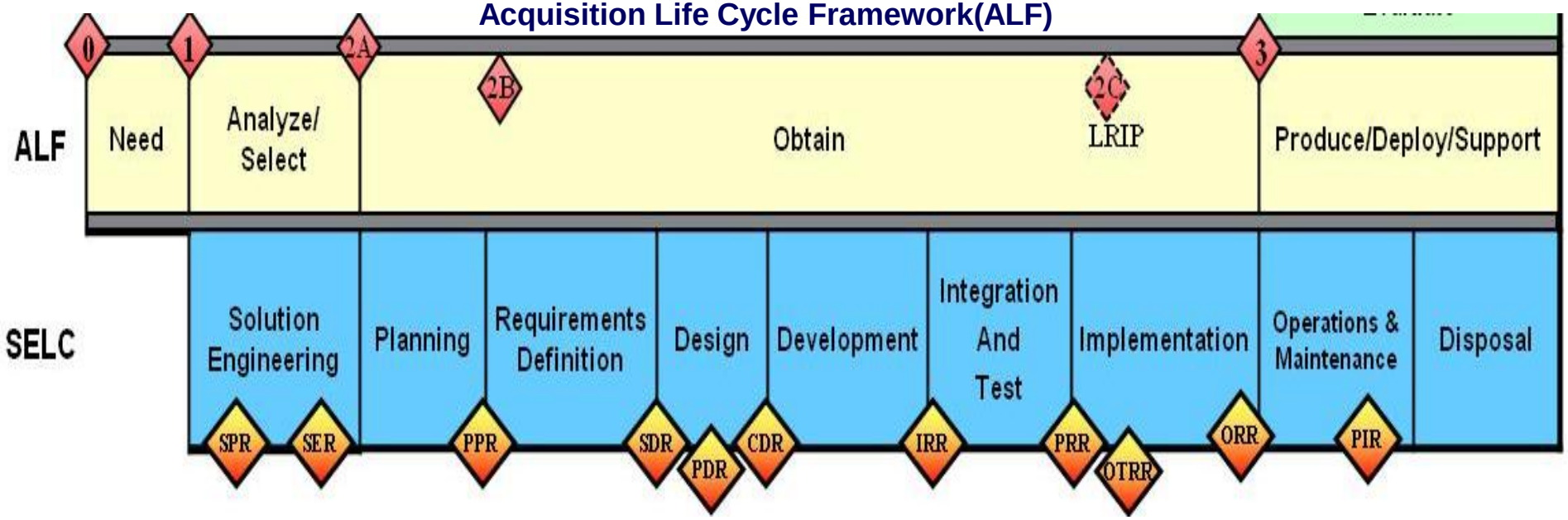
# DoD's ALF and DHS's ALF & SELC




**Acquisition Life Cycle Framework(ALF)**




**Systems Engineering Life Cycle (SELC)**

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# DHS Systems Engineering Center of Excellent

**SE Best Practices & Lessons Learned**

**SE Training & Certification**

**Recommendations for Monitoring & Analyzing Program Technical Health and Artifact Quality**

**DHS SE COE**

**SE Support to DHS Programs**

**Implement Enterprise Systems**

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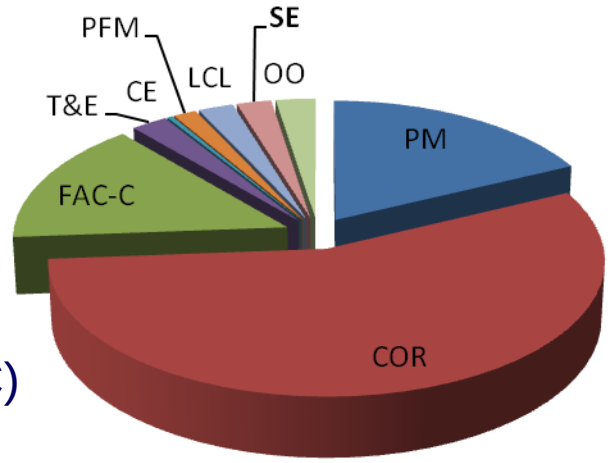
# Acquisition Career Management

Robust Certification Programs

- Cost Estimating
- Life Cycle Logistics
- Test and Evaluation
- Program Management
- Program Financial Manager
- Federal Acquisition Certification, Contracting(FAC-C)
- Federal Acquisition Certification-Contracting Officer Representative (FAC-COR)
- Ordering Official
- Warrant Program
- **Systems Engineering**




***6 April 2012, DHS Acquisition Workforce Division issued an Acquisition Certification Policy for Systems Engineering***

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

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# Revising DHS SELC Acquisition Guidebook

- Define a rigorous SE methodology that will allow DHS leadership to understand the **technical maturity** of their programs
- Highly useful to **PMs** and **SE Practitioners** as they guide and control their programs and projects
- Balance between: **technical processes – stage reviews – documentation**

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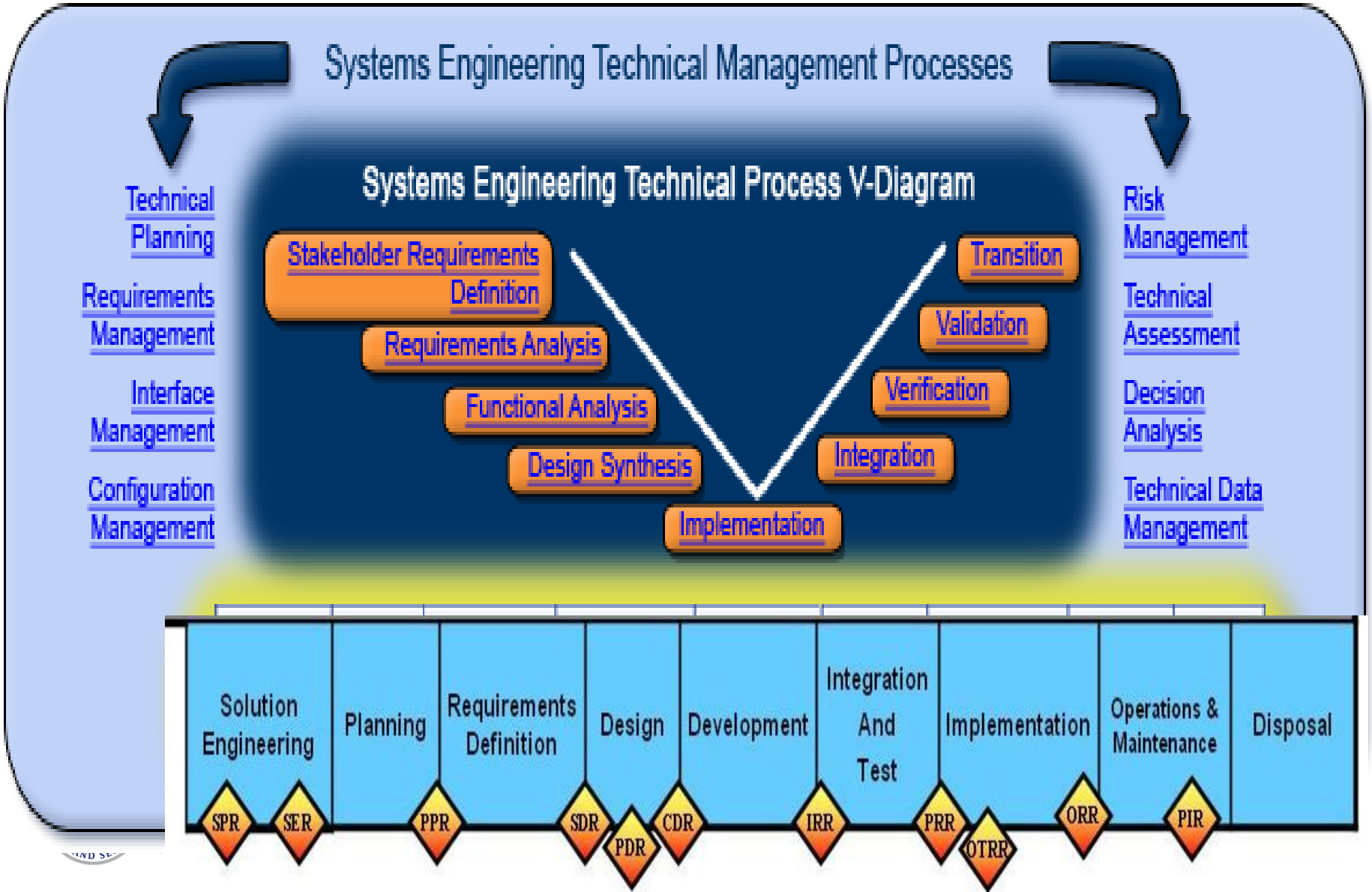
# SE Technical & Technical Management Processes



# Section 2: Tailoring Considerations

## 2.3 Tailoring Development Methodologies

- *Waterfall, Incremental, Iterative, Agile, Spiral, and Evolutionary Methodologies*

## 2.4 Tailoring Paths

- COTS/GOTS, and COTS/GOTS w/Integration
- Stand Alone Services
- IT Infrastructure
- Small/Non-Complex Programs
- Facilities/Construction

# Summary

- Homeland Security is larger the DHS and has a widerange of mission areas
- DHS has a civilian / law enforcement culture
- Acquisition still somewhat synonymous with procurement in many areas
- DHS realizes Systems Engineering needs to be institutionalize
- SE COE stood-up and now helping DHS Acquisition PMs
  - Developed Level I,II, & III SE certification program
  - Revising the SELC Guidance based on best practices across the Federal government
- Looking to continue collaboration with other government agencies

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