Fly - Fight - Win

Chief Systems Engineers
Challenges & Opportunities

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Key Points

- How We’re Organized to Support the Mission
- Key Engineering Challenges
- Major Improvement Initiatives
USAF Mission Links
Strategy to Systems

- Clear linkage: National Security Strategy, Combatant Commander requirements, Air Force capability planning, system resourcing
- Reducing risk to the Joint and Coalition fight
- “Fly and Fight” in Three Domains - Air, Space, and Cyberspace
- Across 12 Air Force Core Functions into 50+ AF Capability Areas
- Enabled by Systems
- Managed by Program Managers and their Chief Engineers

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USAF Organization

Recruit, Train, Educate

Organize, Train, Equip Airmen
Provide Support to Combatant Commanders

Develop, Acquire, Sustain Warfighting Systems
USAF SE Organization

SAF/AQX & SAF/AQR

Recent Restructure

Space

AF-Level Policy

Non-Space

Command-Level Policy

Center-Level Policy

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“Line” Engineers

Grey Beards Competency Managers Low Density, High Demand Independent

Service Acquisition Executive

AF Life Cycle Mgt Ctr (AFLCMC) WPAFB, OH

Staff & Functional Offices

PEOs

Agile Combat Support Directorate WPAFB, OH
Strategic Systems Kirtland AFB, NM
ISR/SOF Directorate WPAFB, OH
Armament Directorate Eglin AFB, FL
Mobility Directorate WPAFB, OH
Battle Mgt Directorate Hanscom AFB, MA
Tanker Directorate WPAFB, OH
C3I/Network Directorate Hanscom AFB, MA
Fighters/Bombers Directorate WPAFB, OH
Business Enterprise Systems Directorate Gunter Annex, AL

Former Aerospace Sustainment Directorate (ASD) Program Offices remain in place but report to respective PEOs

66 ABG Hanscom AFB, MA
Propulsion Directorate Tinker AFB, OK
AFSAC Directorate WPAFB, OH
Cost & Financial Analysis Directorate WPAFB, OH
Intelligence Directorate WPAFB, OH
High Power Directed Energy Program Dir. KAFB, NM

88 ABW WPAFB, OH
Program Development & Integration Directorate WPAFB, OH
Technical Engineering Services Directorate WPAFB, OH
Contract Execution Directorate WPAFB, OH
Life Cycle Management & Services Directorate WPAFB, OH

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Key Engineering Challenges

- Prolific & Sometimes Inconsistent Engineering/Technical Policies

- Domain Presumptive Solutions:
  - SE should start with capability needs vice system needs

- Capabilities vs. Systems:
  - Capabilities are enabled by SoS/FoS…rarely by single systems
  - But we manage (fund, govern, and report) by system

- State-of-the-Art Systems:
  - Incredibly complex & software intensive

- Unrealistic Cost & Schedule Constraints:
  - Biggest burden on Chief/Lead Systems Engineers today
  - Balancing OSS&E and mission assurance activities, Specs and Standards tailoring, and technical reviews with demands of achieving milestones
A Few More Challenges

- Technical Workforce:
  - Experience: Significant decline in average experience in next 5 years
  - Opportunities: Few new systems to train new engineers
  - Competencies: Unbalanced across our programs
  - Chief/Lead Systems Engineers: Insufficient coverage
  - Specialty Engineers (LDHD): Demand outpacing supply

- Processes & Tools:
  - Program-centric: Costly with limited leverage across programs
  - Trust & confidence in M&S vs. test capability & cost

- Specs & Standards:
  - Atrophy: Need SE, Mfg, and others associated with unique military functions

- Ensuring adequate developmental testing
  - And minimizing surprises in OT&E
Major Improvement Initiatives

- People & Training
  - Right People, Right Place, Right Time
  - Competency Management
  - Recurring Training; Meaningful & Renewable Certifications

- Policy
  - Sensible, Executable, Stable, Inspectable

- Processes & Tools
  - Appropriate for our era and the complexity of our work
  - Documented, Standardized Where Needed, Used
  - Ex: Airworthiness & Other OSS&E Carts, SE for Urgent Needs, Knowledge Mgt

- Specs & Standards
  - Resourced, Updated & Maintained
  - On contract when appropriate

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Summary

- Chief/Lead Systems Engineers’ Role Never More Critical
  - ...and never more difficult
- Acquisition OPSTEMPO Biggest Threat to SE Rigor
- Processes, Standards & Tools Essential to Our SE Competency
  - Appropriate for our era and the complexity of our work
  - Documented, Used, & Standardized Where Needed

**Disciplined Systems Engineering is Still Recognized as Key to Acquisition Success**

**Chief/Lead Systems Engineer is the PM’s Technical Authority Charged to Make That Happen**

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