

Headquarters U.S. Air Force

Fly - Fight - Win

Chief Systems Engineers Challenges & Opportunities



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Key Points

- **USAF Mission: “Fly & Fight in Air, Space, & Cyberspace**
- **How We’re Organized to Support the Mission**
- **Key Engineering Challenges**
- **Major Improvement Initiatives**

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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

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USAF SE Organization

SAF/AQX & SAF/AQR



AF-Level Policy

Recent Restructure

Space

Non-Space



Command-Level Policy

Center-Level Policy

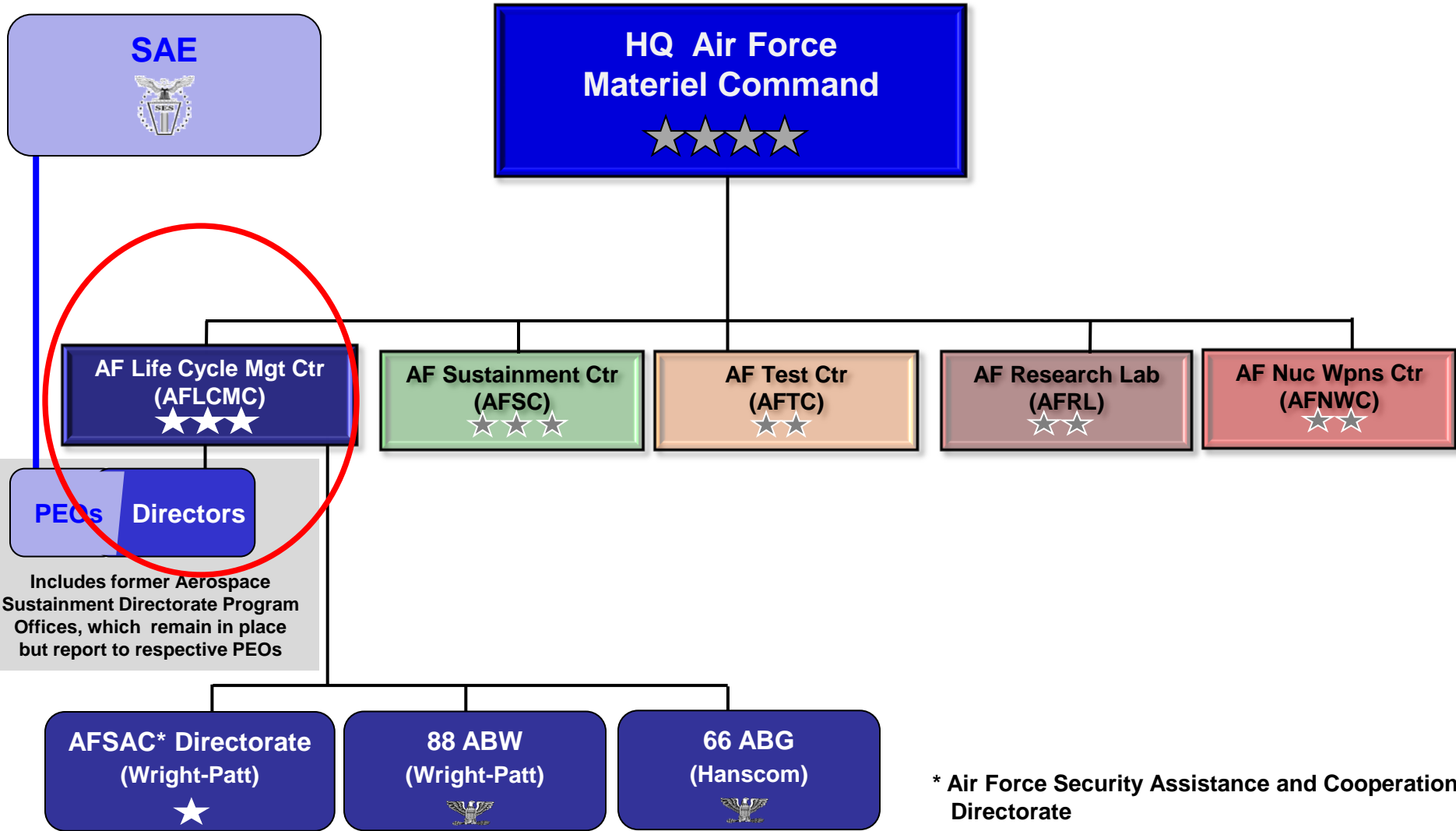
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AFMC Restructure

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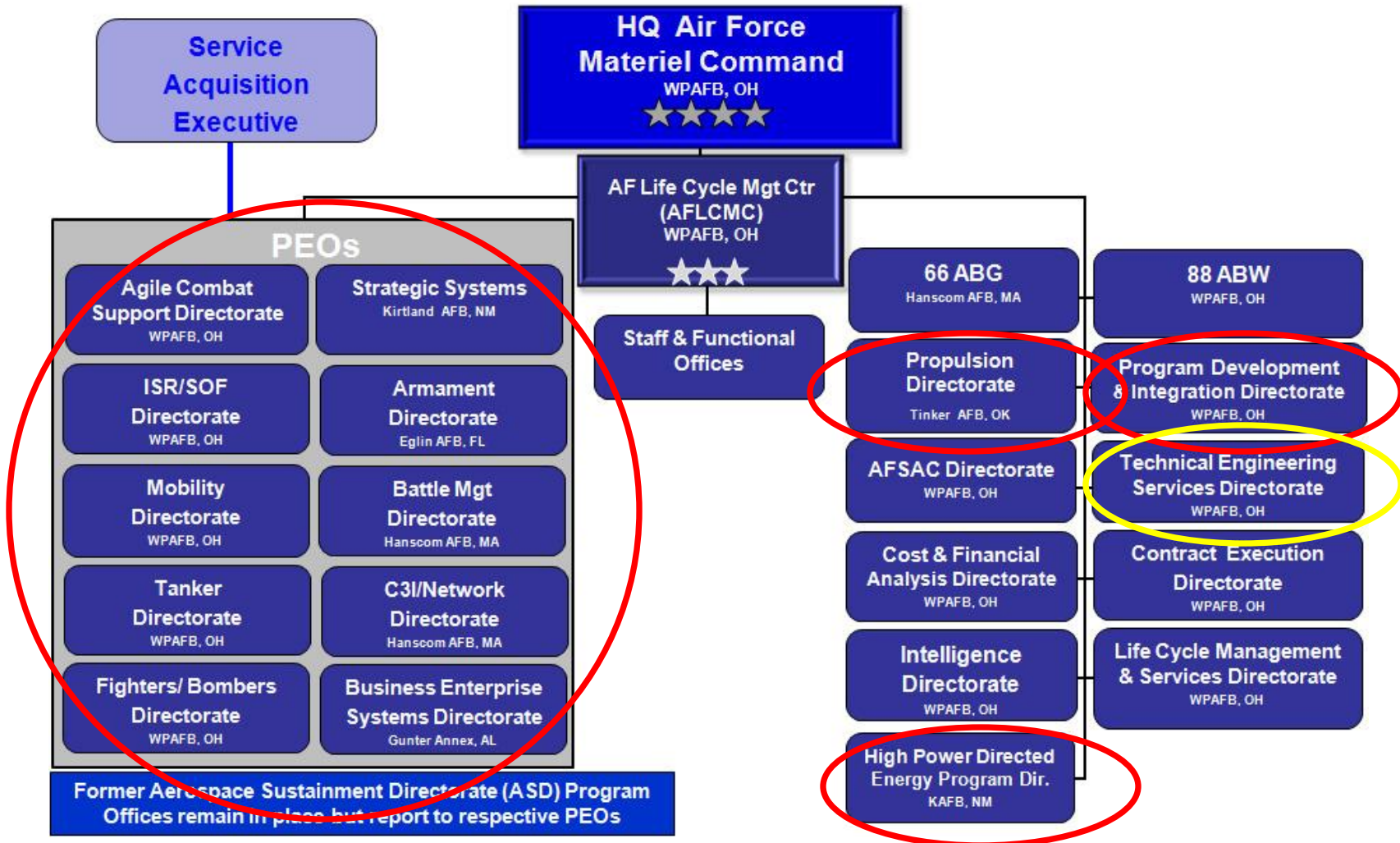
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"Line" Engineers

"Grey Beards" Competency Managers
Low Density, High Demand Independent

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AFLCMC



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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

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A Few More Challenges

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- **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**

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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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