• Dominant Air Power: Design For Tomorrow…Deliver Today

USAF Airworthiness Policy and Process Updates

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Purpose

• Provide background

• Summary of USAF airworthiness policy directive and instruction

• Summary of Software AW Criteria

• Future actions
Previous USAF Airworthiness Policy

• **ASC Responsibilities:**
  – Develops guidelines/processes for determining airworthiness for new and modified aircraft systems (MIL-HDBK-514, OSS&E)
    • Publish and maintain *Airworthiness Certification Criteria* document (MIL-HDBK-516)
    • ASC/EN acts in “review and advise” role

• **Single Manager Responsibilities:**
  – Certify aircraft system airworthiness and document the method of compliance with applicable *Airworthiness Certification Criteria* (MIL-HDBK-516)
    • Documented in Tailored Airworthiness Certification Criteria (TACC) document

Program management chain is responsible for program execution **and** for airworthiness certification

*War-Winning Capabilities ... On Time, On Cost*
Why have we done this???

• Independent airworthiness certification is standard/best practice in aviation
  – Other US Military (Navy, Army), Foreign Military, US Civil (FAA), European Civil Aviation (EASA), NATO, etc.

• USAF AW process is not independent
  – Program Manager is AW authority
  – Inconsistent implementation AW across USAF

• AW policy lacked an option for flight releases
Direction for Change

- **Air Force directed:**
  - Independence of AW certification authority
  - Designated ASC/EN as Center of Excellence
  - Update to AF Policy Directive 62-6 integrating all AW Policy
  - New Air Force Instruction (AFI) 62-601

- **AFPD & AFI currently in publications @ Air Staff**
  - AFPD 62-6 signed 23 Apr 2010
  - AFI 62-601 signed 3 May 2010
  - 2-year compliance window
USAF Policy and Instructions

Yesterday:

- AFPD 62-4
- AFPD 62-5
- AFPD 62-6
- Airworthiness Certification Circular #6
  “Special Operational Airworthiness Release (SOAR) Process”

Future State:

- AFPD 62-6
- AFI 62-601
- AFI 62-601/AFMC Sup 1

Air Force direction: Combine these

- MIL-HDBK-514
- MIL HDBK-516B, Change 1
- MIL HDBK-516B, Expanded

MIL-HDBK-514A, OSS&E
Airworthiness Bulletins

MIL-STD-516C

War-Winning Capabilities ... On Time, On Cost
Airworthiness Authorities

LAW TITLE X

AFPD 62-6
AFI 62-601

Technical Airworthiness Authority

Technical Airworthiness

Operational Airworthiness

Safety & Investigative

Operational Command CC

Air Force Safety Center

MIL-HDBK-516
AW Bulletins
Center Instructions

Operations and Maintenance Manuals, 90 Series AFIs

MIL-STD-882
AFI 91-202

Focus of Current Effort

War-Winning Capabilities … On Time, On Cost

Distribution Statement A: Case Number: 88ABW-2010-3225, WPAFB, 11 Jun 2010
Policy and Instruction
Key Points

• Applies to all USAF aircraft
  – Incremental policy compliance over 2 yrs
• Establishes Independent Airworthiness Process/Authority
• Creates Technical Airworthiness Authority (TAA)
• Design based airworthiness certification processes
  – Criteria / Standards / Methods of Compliance
• Non-design based flight release processes
Revised USAF Airworthiness

- Independent “finding & declaration” approach
  - Organizational separation of system development activities and airworthiness determination
    - Establishes the TAA as decision authority
    - Focus on those programs/activities exhibiting a high level of risk (i.e., new starts and reportable modification efforts)
    - Low risk activities assessed through authority delegated by the TAA
  - TAA becomes single face to internal and external organizations for airworthiness activities
  - Final “products” consistent across multiple platforms
    - Military Type Certificates
    - Military Airworthiness Certificates
    - Experimental, Restricted, Special Flight Releases
Software AW Criteria

• SW specific AW criteria is scattered throughout sections
• MIL-HDBK-516B, Chg 1
  – Section 6.2, Vehicle Control Functions
  – Section 7, Propulsion
  – Section 14.3, Software Safety
  – Section 15, Computer Resources
  – Section 20.1, Mission/Test Equipment

Work with AW Subject Matter Experts to define specific tailoring of standards and methods of compliance
### SW AW Criteria Example

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>STANDARD</th>
<th>METHOD OF COMPLIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2.5.5</td>
<td>Verify that software compatibility with external, integrating software functions is safe.</td>
<td>The Hardware/Software Compatibility Matrix is defined. This matrix defines the configurations of air vehicle hardware and software that meet the functions specified. The hardware and software listed is compatible, but may have limitations that can degrade functions or inhibit specific usage. The Hardware/Software Compatibility Matrix state the limitations of the hardware or software.</td>
</tr>
</tbody>
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<td>15.3.2.2</td>
<td>Verify that the software design, timing, control flow, interrupt structure, and data structures meet the required processing capabilities of the Safety of Flight subsystem/system real-time architecture.</td>
<td>Verification is accomplished through extensive system/subsystem integration tests and FMET. These tests ensure the OFP meets required execution rates under worst case operational timing and failure conditions.</td>
</tr>
</tbody>
</table>
Future Actions

• Publication of policy directive and instruction
• Define standardized practices and processes required to implement airworthiness policy across USAF
  – Near-term
    • Build upon existing ASC AW practices and processes
    • Airworthiness Bulletins (internal/external direction & guidance)
    • Launch updated AFIT SYS116 on-line course
    • Define TAA delegations (individual and organizational)
  – Long-term - full implementation (2 year window)
    • Web-based tool set incorporating automated features
    • MIL-STD-516C
AF AW Points of Contact

- Further inquiries can be directed to the ASC/ENSI Mailbox: asc.ensi.mailbox@wpafb.af.mil