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• ***Dominant Air Power: Design For Tomorrow...Deliver Today***



**U.S. AIR FORCE**

# **USAF Airworthiness Policy and Process Updates**

**Robert McAllister**

ASC/ENS

Wright Patterson AFB, OH

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# Purpose

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- **Provide background**
- **Summary of USAF airworthiness policy directive and instruction**
- **Summary of Software AW Criteria**
- **Future actions**



# Previous USAF Airworthiness Policy

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- **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

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# Why have we done this???

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- **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

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- **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

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# USAF Policy and Instructions

## Yesterday:

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

Air Force direction:  
Combine these

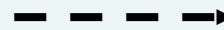
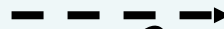


## Future State:

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

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

SUPPORTING  
DOCUMENTS

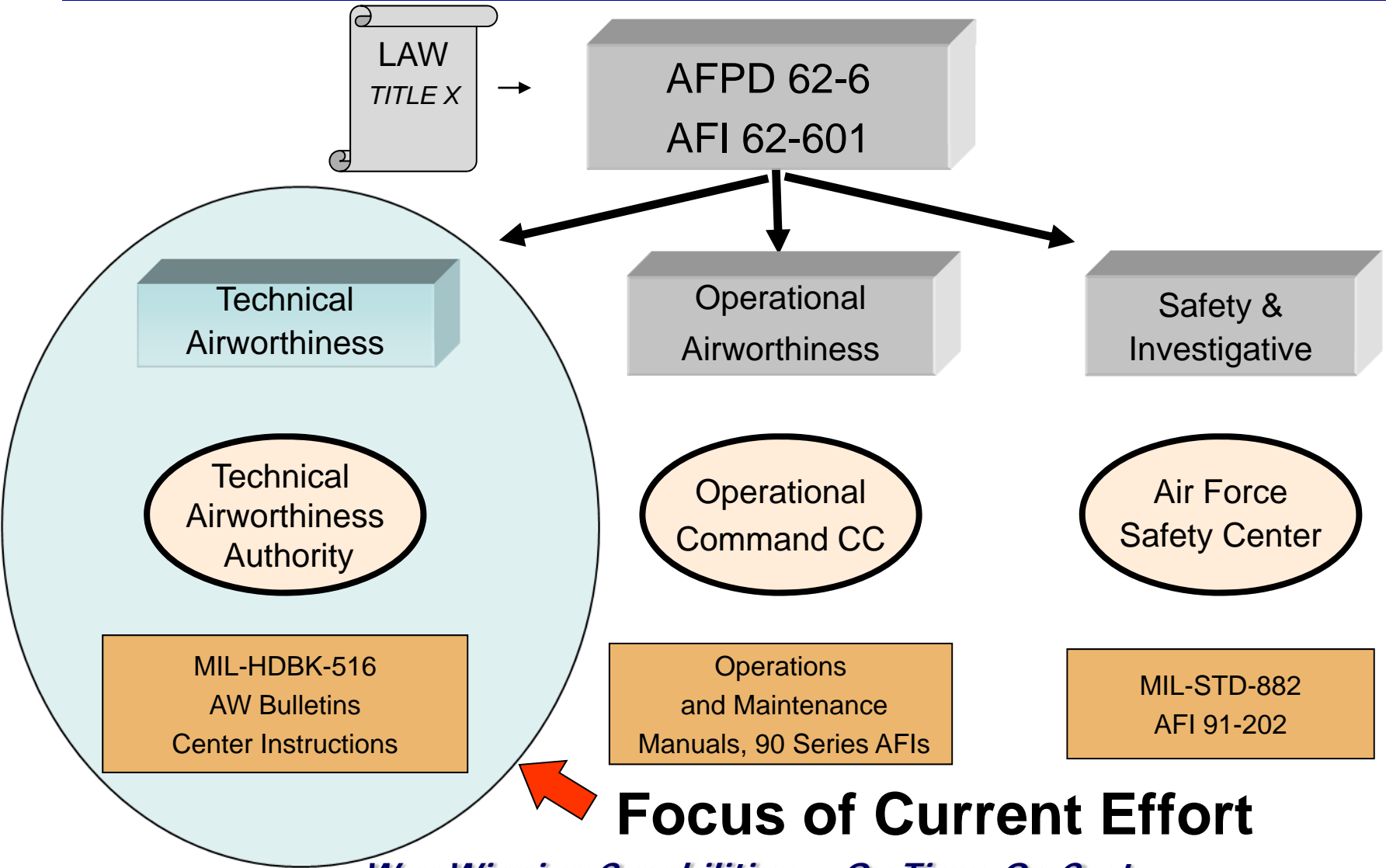


- MIL-HDBK-514A, OSS&E
- Airworthiness Bulletins
- MIL-STD-516C

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# Airworthiness Authorities



**Focus of Current Effort**

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# Policy and Instruction

## Key Points

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- **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

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- **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

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# Software AW Criteria

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- **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

	CRITERIA	STANDARD	METHOD OF COMPLIANCE
6.2.5.5	Verify that software compatibility with external, integrating software functions is safe.	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.	Hardware/Software Compatibility is demonstrated by test and analysis. System level integrated testing validates that communications and data exchange meets the system functional requirements. Deviations, waivers, and trouble reports are documented and dispositioned according to the program Deficiency Reporting (DR) process and guidelines.

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# SW AW Criteria Example

	CRITERIA	STANDARD	METHOD OF COMPLIANCE
15.3.2.2	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.	The software design architecture, software functional control flow mechanization and data structures are compatible with the system/subsystem real-time dependencies for safety/flight critical processing without latencies.	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.

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# Future Actions

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- **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

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# AF AW Points of Contact

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

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