Air Force Test Center

USAF Airworthiness Overview and the AFTC

Mr. Alan Colthorp
896th Test Support Squadron
Eglin AFB, FL
Agenda

• USAF airworthiness overview
  – Terms and Definitions
  – Policy and Application
  – Scope
  – Independence and Interdependence
  – Processes
  – Airworthiness Community
  – Airworthiness within AFTC

• Summary
Definitions

WE’RE NOT air WORTHY!!!!!
Airworthiness Terms and Definitions


- **Airworthiness** - The verified and documented capability of an air system configuration to safely attain, sustain, and terminate flight in accordance with approved usage and limits.

- **Airworthiness Certification** - A repeatable process which documents compliance with the approved certification basis.

- **Certification Basis** - The set of approved airworthiness certification criteria, standards, methods of compliance that apply to a specific air system.
  - It is typically derived from MIL-HDBK-516C, USAF Airworthiness Certification Criteria.

Airworthiness Authorities (DoD, FAA, Foreign Civil And Military) May Have Different Terms And Definitions But The Concept Is The Same
• The Air Force is responsible for assuring the airworthiness for all air systems operated by organizational components of the AF, manned or unmanned, including:
  – Air Force Reserve Command
  – Air National Guard

• AW responsibilities for aircraft procured under FMS cases shall be defined in the LOA for the case.

“All aircraft and air systems owned, leased, operated, used, designed, or modified by DoD must have completed an airworthiness assessment in accordance with Military Department policy.” DODD 5030.61, 24 May 13
Military Designed Aircraft

- F-15E
- F-15
- F-16
- F-22A
- F-35A
- B-1
- B-2
- B-52
- C-17
- C-5
- T-38
- U-2
- C-130
- A-10
- KC-135
- HC/MC/WC-130
- AC-130
- EC-130
- RC-135
Commercial Derivative Aircraft

- KC-10
- VC-25A
- E-4
- C-9
- C-40
- E-3
- E-8
- C-32
- T-43
- C-20
- T-1A
- C-37
- T-6A
- C-12
- MC-12
- C-27
Rotorcraft and Unmanned Vehicles

Small Unmanned Systems (sUAS)

Medium and High Altitude Unmanned Systems

Rotorcraft
USAF Airworthiness Scope

Flight Releases, Type Certifications, Airworthiness Certificates

Operators and Maintenance Manuals

Configuration Management

Flight Test Peculiar: Aircraft Operating Limits (AOLs) Continuation Criteria Envelope Expansion Plan Aircraft Maturity

Manufacturing Support and Quality

Continued and Continuing Airworthiness

Technical Risk Assessment

Keys to success: Qualified PEOPLE, Proven PROCESSES, Effective TOOLS
Authority Independence

Title 10 Authority

USAF
CSAF/ SECAF

AFMC/CC

Formal Delegation

AFLCMC/EN-EZ
Director, Technical Airworthiness Authority (TAA)

Component Acquisition Executive (CAE)

Program Executive Officer (PEO)

Program Manager (PM)

Major Operational Commands (MAJCOM)

Air Combat Command (ACC)
Air Mobility Command (AMC)
Air Education & Training Command (AETC)
AF Special Operations Command (AFSOC)
Etc.

TAA is Independent of the Acquisition & Operational Chains
Foundational Aspects Of Technical Airworthiness

Technical AW

Suitably Qualified and Experienced Personnel (SQEP)

AW Bulletins / AW OIs

System Safety Policy & Instructions

MIL-HDBK-516 Airworthiness Certification Criteria

AF Policy & Instructions
SQEP Endorsement

Technical Endorsements

FY 12
EZ
SMEs (~1000 Criteria)

FY 13
USAF
(TA)
(17 Sections)

FY 13
NAC
TDs & SLs
(3 Domains)

FY 13
TAA

Assessment
MIL-HDBK-516C
Data-Driven Processes

- Flight Authorization
- Certification Basis Development
- Planning
- Airworthiness Board Review
- Risk Identification & Acceptance
- Compliance Assessment
USAF Technical Airworthiness Data Package

1. Certification Basis
   - TAILORED MIL-HDBK-516B Expanded*
   - Data Artifacts
   - Criteria Non-compliances
   - Hazards & Mitigations
   - System Safety Risk Assessment

2. Compliance Report

3. Risk Acceptance Documentation

4. Flight Authorization

* USAF required Criteria, Standards, and Methods of Compliance
Formal Risk Acceptance

Risk Level per AWB-013

- High Risk Acceptance (Acquisition)
  - Component Acquisition Executive (CAE)
  - Major Operational Commands (MAJCOM) Coordination

- Serious Risk Acceptance (Acquisition)
  - Program Executive Officer (PEO)
  - Major Operational Commands (MAJCOM) Coordination

- Low to Medium Risk Acceptance (Acquisition)
  - Program Manager (PM)

A flight authorization is granted only after the risks of non-compliance are formally accepted as part of an active risk management plan.
Airworthiness Community

- FAA and DoD through NAC
- FAA and International CAAs Through Formal Agreements
- DoD and International MAAs Through Formal Agreements
- Many International MAAs Have Close Ties Or Are Linked With Their CAA
Airworthiness and AFTC

• AFTC aircraft modifications support flight testing (T-2 Mods)
• Hundreds of T-2 Mods performed each year within AFTC
  – 412TW at Edwards AFB
  – 96TW at Eglin AFB
    • 96TG at Holloman AFB

• Each aircraft modification requires an airworthiness determination
Examples of T-2 Mod Installations
Modification Installation Area

King Hangar   Bldg 130
Airworthiness

- Airworthiness regulations were released that could have affected flight clearance processes to USAF aircraft used by 96TW and 412TW

- Changes in Local Authority could have impacted test execution
  - Previous authorities were no longer valid
  - Longer timelines for flight clearances supporting T-2 modifications

- IPT Working Group was formed to work AW issues at the Test Centers
  - Members included personnel from Edwards, Eglin, Holloman, and Wright Pat
  - IPT Recommendation: Delegate local Chief Engineer Delegated Technical Authority (CE/DTA) at test locations for unique test airworthiness determinations
Airworthiness Guidance

• AFI 62-601 assigns responsibility to the air system Program Manager (PM) for planning and executing airworthiness programs for managed aircraft.

• Outlines the process for an independent airworthiness determination.
  • An authority outside of the program execution chain is responsible for approving the flight operation of an air system configuration and the conditions of that operation.

• Establishes the Independent Technical Airworthiness Authority (TAA).
  • TAA is designated by the Commander, HQ Air Force Materiel Command designates the TAA as directed by AFPD 62-6.

• Responsible for assuring the airworthiness of the aircraft which it operates.
Delegation of Authority

• Per AFPD 62-6, TAA may delegate AW authorities and responsibilities to:
  • An individual who meets qualifications, not position
  • Allow two years to comply with qualifications

• Responsibilities defined in Attachment 2 of AFI 62-601

• Further delegation authorized to AFMC Test Centers:
  • Make and document a positive safety of flight determination

• Bottom Line: IPT recommended proposal of qualified individuals to perform local T&E CE/DTA responsibilities for airworthiness to the USAF TAA
Test Center Delegations

**USAF TAA**

Delegated by TAA; Responsible for Reportability Determinations on MDSs at Acquisition Center

**DOE/DTA**

(e.g., Fighter/Bomber)

- Delegates
- Airworthiness Impact
- Reportability Determination

**CE/DTA**

(e.g., F-16)

- Delegates
- Airworthiness Impact
- Reportability Determination

**T&E “DOE/DTA”**

(One within AFTC)

- Delegates
- Airworthiness Impact
- Reportability Determination

**T&E “CE/DTA”**

(One per MDS at Test Location)

- Delegates
- Airworthiness Impact
- Reportability Determination

Responsible for Reportability Determinations on T2 Mods on MDSs at Test Center Based on Delegations Received from DOE/DTA(s)

Responsible for T2 Mods on a Single MDS Based on Delegation from that MDS CE/DTA

Designated by DOE/DTA; Responsible for all OSS&E and AW on a Single MDS

Annual Report
Center Testing Requirements

• Temporary T-2 Modifications
  • Guided by per AFMCI 21-126
  • May be independent of a specific test program
  • Modifications performed by 896th Test Support Squadron (Eglin), 412th Test Engineering Group (Edwards), 96th Test Group (Holloman)
  • Delegated authority to the Modification Engineering Authority (MEA) to assess safety of flight impacts of T2 Modifications
    • Minor modifications are not normally expected to affect airworthiness
    • Minor modifications cleared locally via the Configuration Control Board (CCB) with Engineering Analysis conducted by the 896 TSS
    • Major modifications worked in coordination with Program Offices
  • 896 TSS received MEA delegations for F-16, F-15, and A-10
    • 96th Test Group (Holloman) received MEA delegations for T-38 and C-12
Summary

• USAF Airworthiness Office at WPAFB is the lead for the AF in all technical airworthiness related matters
  – Processes and people are in place and we are issuing flight authorizations everyday
  – Other US services and nations recognize and accept the USAF airworthiness process and the products it produces
    • Credibility strongly tied to “Data”

• For further information or questions, contact the USAF Airworthiness Office at:
  usaaf.airworthiness.office@us.af.mil
Any Questions?