Boeing’s Approach to Airworthiness/Certification of Military Aircraft

Thomas Caramanico
Boeing Military Aircraft Certification & Airworthiness
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Topics

► Boeing Defense Systems Airworthiness Certification Council

► Boeing Military Products

► Tailored Approaches to Certification

► Commercial Derivative Aircraft

► Military Aircraft

► Leveraging International Military Type Certificates (MTCs)

► Recommendations for improvement
Boeing Defense Systems
Airworthiness Certification Council

Purpose:

► The Airworthiness Certification Council (AwCC) is a forum for certification and airworthiness leaders across Boeing Defense Systems

► Goal is to improve certification and airworthiness processes and activities from proposal through continued airworthiness

Council Strengths:

► Independent Subject Matter Experts (SMEs), Designated Engineering Representatives (DERs), Unit Members (UMs)

► Some sites have United Kingdom Design Approved Organization Scheme

► Assignment of Authority (AoA) has been delegated to Boeing by certain countries

► Communication across Boeing divisions
Boeing has 4 Divisions that Produce Military Platforms

- **Vertical Lift**
- **Global Strike**
- **Mobility, Surveillance & Engagement**
- **Unmanned Airborne Systems Programs**
# Boeing Military Aircraft Platforms

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<th>Global Strike</th>
<th>Mobility, Surveillance and Engagement (MS&amp;E)</th>
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Commercial Derivative Aircraft

Examples:

- **Boeing 737-Next Generation Family Baseline Aircraft**
  - **P-8A Poseidon** Maritime Patrol Aircraft
  - **KC-46A Pegasus** Tanker

- **Boeing 767 Family Baseline Aircraft**
  - **Italian Air Force KC-767**
  - **JASDF KC-767**
  - **Japanese Air Self-Defense Force (JASDF) E-767 AWACS**

- **E-7A Wedgetail** Airborne Early Warning & Control (AEW&C)

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Certification Approach:

- Utilize the initial Type Certificates (TCs) from Federal Aviation Administration (FAA)
- Approve Modifications/Changes through Organization Designation Authorization (ODA)
- Develop Supplemental Type Certificates (STCs) for the military systems through the FAA Military Certification Office (MCO)

or:

- Submit artifacts and data for Military Type Certificate from Military Airworthiness Authority (MAA)
- **Option:** Delegate limited authority to BDS Internal Airworthiness personnel
Military Aircraft

AH-6 Little Bird Attack Helicopter
AH-64 Apache Attack Helicopter
CH-47F/ICH-47F Chinook Heavy Lift Transport Helicopter
C/MV-22 Osprey Troop Assault Tiltrotor

F-15 Eagle and Strike Eagle
F/A-18E/F Super Hornet EA-18G Growler
KC-767 International Tanker B-52H Stratofortress

H-6U Optionally Manned Little Bird
S-100 Camcopter UAS
Scan Eagle Unmanned Aircraft System (UAS)
RQ-21 Blackjack/Integrator UAS
Certification Approach:

► Requirements, Design / Development, Qualification / Certification

► Provide artifacts, data, and information to Military Airworthiness Authority

► Support the activities to issue MTCs (Airworthiness Release [AWR]) for US and International aircraft

► Option: Delegate limited authority to Boeing Defense, Space & Security (BDS) Internal Airworthiness personnel
Various Tailored Approaches:

- Type Design Examination and Delegated Airworthiness Authority (Assignment of Authority)

- Comply with DEF-STAN-970 with supplemental White Papers
  - Sub-System Qualification Documents, Safety Case

- Support European companies certification to Defence Ministries

- US Government may provide AWR for air vehicles

- Opened “books” to customers for audits of:
  - Data, processes, records, documents, procedures, artifacts
  - Provided statements of compliance, and white papers
Military Certification Comparison

Commercial Derivative Process

- FAA Type Certificate (TC)

- FAA Military Certification Office (MCO) or Military Airworthiness Authority (MAA) Certification

Military Modifications, Design & Testing

- Military Modifications, Design & Testing

- Organization Designation Authorization (ODA) Review

Military Process

- Requirements

- Design Development

- Qualification & Certification

- Military Airworthiness Authority (MAA)

- Military Type Certificate or Airworthiness Release (AWR)

- Military Type Certificate or Airworthiness Release (AWR)

Tailored Approach Based Upon Direct Commercial Sale (DCS) or Foreign Military Sale (FMS)
Military Type Certificates (MTCs)

► For both the Customer and Industry, Certification is:
  ► Expensive
  ► Time consuming

► How do we help increase confidence in other country’s MTCs?
  ► Supplemental Audits of manufacturers
  ► Closer examination of the safety records of same platform in other countries
  ► Examine other MAAs certification processes

► How do we ensure safety and airworthiness, but save time and money?
What can industry do to improve the Military Aircraft certification process and save money?

► Offer Airworthiness/Certification delegates
  ► Assignment of Authority (AoA)
► Improve Audits from MAAs
  ► “Open Book” policies of documents
► Provide supplemental information/data
► Improve the way industry demonstrates how compliance and certification was accomplished with other countries
  ► Examination of certification processes (Type Design Examinations)
Boeing’s Recommendations to Improve Certification Process and Reduce Costs

- Permit certification discussions with the manufacturer’s airworthiness personnel with MAA prior to contract award

- Early discussions on:
  - Basis of Certification
  - Methods of Compliance

- Contractor – MAA Agree on the certification approach

- Early development and acceptance of Certification Plans
  - Identify the artifacts and results expected

- Delegate some Authority where practical/reasonable

- Continue with Mutual Recognition of Airworthiness - MTCs
Thank you. Questions?

**Contact Information:**

**Thomas Caramanico**  
Boeing Military Aircraft  
email: thomas.r.caramanico@boeing.com
Acronym Definitions

- Airworthiness Certification Council (AwCC)
- Airworthiness Release (AWR)
- Assignment of Authority (AoA)
- Designated Engineering Representative (DER)
- Federal Aviation Administration (FAA)
- Japanese Air Self-Defense Force (JASDF)
- Military Airworthiness Authority (MAA)
- Military Certification Office (MCO)
- Military Type Certificate (MTC)
- Mobility, Surveillance and Engagement (MS&E)
- Organization Designation Authorization (ODA)
- Subject Matter Expert (SME)
- Supplemental Type Certificate (STC)
- Type Certificates (TCs)
- Unit Member (UM)
- Unmanned Airborne Systems (UAS)