Military Commercial Derivative Aircraft

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Outline

- FAA Certification on Military Aircraft
- Military Commercial Derivative Aircraft (MCDA)
- FAA/Armed Services Memorandum of Agreement and FAA Military Certification Office
- New FAA Order 8110.101 for MCDA
- Certification Approach and Strategy for MCDA
The FAA and Military Aircraft

- No FAA issued Type Certificate or Airworthiness Certificate is required for aircraft owned and operated under military registration- FAA is not the A/W authority for these Aircraft.

- FAA Airworthiness Certificate is required for contractor to operate aircraft prior to military ownership.

- Armed Services can own and operate aircraft under FAA registration if aircraft are maintained and operated under civil regulations.

- FAA authority comes only from the ability to regulate and oversight the civil Type and Production Certificates

- FAA type certification is a choice the military can make- imposed by contract rather than civil regulatory requirements
Why FAA Certification?

• Assure flight safety

• Take advantage of reduced development cost and schedule

• Leverage off commercial aviation manufacturing and maintenance

• Reduce spare part costs by belonging to FAA parts pool\(^1\)

• Make use of commercial aviation operational tools

\(^1\) Must establish agreement and concurrence from the FAA
Why FAA Certification?

- Uses established and proven airworthiness standards
- Ensures that modifications to baseline platforms consider original design requirements and limitations.
- Takes advantage of FAA designee and delegated organization system
- Supports DoD acquisition strategy and policy
What Is a Military Commercial Derivative Aircraft?

• A Military Commercial Derivative Aircraft - commercially produced aircraft with an FAA Type Certificate and produced under an FAA Production certificate, “commercial off the shelf” product.

• MCDA may be modified to varying extent for use as a Military aircraft if manufactured under the Production Certificate

• Military modifications may be fully, or partially, FAA approved to civil statutes for purpose of retaining airworthiness certification.

• The FAA baseline certification is the starting point for later substantiation of military modifications
Military Commercial Derivative Aircraft Bottom Line:

- The Armed Services utilize civil airworthiness certification to provide safety assurance for these aircraft

- The Armed Services buy and maintain commercial derivative aircraft to reduce development costs, deployment time, maintenance, and logistic costs

- The Armed Services also leverage use of the commercial system for manufacturing and quality assurance oversight

- The Armed Services assume operational control and oversight, but use commercial derivative aircraft airworthiness processes where possible for continued operational safety
FAA/Armed Services Memorandum of Agreement – The Need

• By law, FAA emphasis is on commercial aviation safety
  – Title 49 USC 40101(a)(1) “assigning and maintaining safety as the highest priority in air commerce.”

• The emphasis on military aviation not so much
  – Title 49 USC 40101(a)(7) “developing and maintaining a sound regulatory system that is responsive to the needs of the public and in which decisions are reached promptly to make it easier to adapt the air transportation system to the present and future needs of--
    (A) the commerce of the United States;
    (B) the United States Postal Service; and
    (C) the National Defense.

• The MOA provides for reimbursement to the FAA for effort spent on military programs, allowing FAA to keep the priorities set by law.
• Article I. Purpose

This Memorandum of Agreement (MOA) relates to providing certification, technical assistance, and continued airworthiness services by the Federal Aviation Administration (FAA) for Commercial Derivative Aircraft (CDA).
FAA Military Certification Office (MCO)

- Created as part of 10 September 2004 MOA between Armed Services and FAA - New 5 year MOA signed in September 2007

- MCO main office in Wichita, KS – Satellite offices in Atlanta & Ft. Worth

- MCO under management from the FAA’s Small Airplane Directorate

- Provides technical Liaison and support for Armed Services, FAA, and Industry to support certification of military commercial derivative aircraft

- Supports national defense, industry interests, and acquisition reform for public benefit

- Ensure DoD projects receive adequate prioritization and support

- Funded by DoD to provide FAA reimbursement for expenditures on CDA (Baseline Services: shared by USAF, Army, Navy, Coast Guard)
FAA Military Certification Office (MCO)

- MCO is the FAA Certification Office which:
  - Establishes and conducts FAA type certification projects for Armed Services military commercial derivative aircraft
  - Assists FAA HQ with unique policies, processes, and procedures to address challenges and improve FAA support for military applications
  - Works with DoD and applicants to identify appropriate airworthiness solutions and maximize certification benefit on CDA

- All FAA MCO projects must have a military sponsor in order to proceed
  - The contractor/applicant must be on contract with military, and
  - The military needs to authorize the MCO in writing
Baseline Support Services are provided for certification of modifications to commercial aircraft that meet the following:

1. The aircraft’s primary mission (for example, carriage of passengers and/or cargo) is not altered;
2. The flight usage spectrum is within the FAA certified flight usage (or can be accommodated by maintenance concepts);
3. FAA expertise and/or civil standards exist;
4. The aircraft are operated and maintained in a manner consistent with the way the aircraft was certified for civil use; and
5. The modification is of a type that a civil applicant would typically request.
• **Program Specific Services** are FAA support for certification, continued airworthiness, and technical assistance to the Armed Services where the modifications to a CDA do not meet the criteria for Baseline Support Services.

  – The procuring Armed Service and FAA HQ will negotiate Program Specific Service Agreements (PSSAs) to support a particular program.

  – The FAA will provide a cost estimate in response to the Armed Services’ requirements.
• Order 8110.101 “Type Certification Procedures for Military Commercial Derivative Aircraft”

• Establishes FAA policy and guidance to support commercial derivative aircraft certification for the US Armed Services

• Unique material for military derivative aircraft certification by FAA personnel, delegated organizations, and FAA designees
FAA Order 8110.101 Highlights

- Instructions on how to apply for FAA military projects- military projects receive priority and do not enter civil project prioritization process

- Provides special guidance and procedures for conformity and compliance findings for military special mission equipment

- Provides guidance for systems and equipment with unique military functions

- Establishes guidance and policy for “Levels of Approval” which support later military approved modifications

- Provides instructions on how to manage “airworthiness seam” between FAA approved type design and end military configuration for hybrid aircraft
MCO – Levels of Civil & Military Certification

- FAA Order 8110.101 establishes policy and guidance to allow certified configurations for military commercial derivative aircraft (through the MCO) which would either render the aircraft ineligible for standard airworthiness certificate or would not be supported for civil operation.

- Certification “Levels of Approval” define extent to which the commercial derivative aircraft platform can support military operation or subsequent military approved modifications.

- “Levels of Approval” allow applicant to define configurations which can be shown to comply with all applicable certification criteria.

- However, the aircraft, or installed modifications may have operational limitations for use in the civil sector.

- Certain certified and installed equipment may be maintained only by the military or public use operator because approved parts are restricted from commercial sale.

- Certification may be limited to carriage of equipment, or provisions for later installation.
Levels of FAA Approval

• **Full Approval**
  • Must meet the same requirements for a modification to a civil aircraft. Include type design data, compliance substantiation, airplane flight manual supplements, maintenance and continued airworthiness documentation.
    
    – Meet all applicable airworthiness regulations.
    
    – The installation is compatible and eligible for use on a civil aircraft of same type without special restrictions or limitations.
    
    – Examples:
      Cabin interior modifications
      Cockpit avionics upgrades
      Flight Management System upgrades
      Installation of Synthetic Vision Systems / Enhanced Vision System
      Electronic Standby Flight Indicator
      ETC.
Levels of FAA Approval

- **Installation Approval: Military Use Only (limitations)**
  - Must meet the same requirements as for a commercial modification to a civil aircraft.
  - Meet all applicable airworthiness regulations.
  - **Installation is not compatible or eligible for civil operation, requires special restrictions or limitations.**
  - Installed equipment may be restricted from commercial sale, but can be FAA approved part.
  - FAA may need help from the military during test to evaluate and determine compliance for this type of equipment because of military security restrictions.
  - Limitations and restrictions defined on the certificate, such as the supplemental type certificate description.
  - If operating the equipment during maintenance must be authorized by the military, any limitations and restrictions must be included in both the airplane flight manual supplement and instructions for continued airworthiness.
  - If the limitations and restrictions can be followed, these installations may be legally permissible to install on N registered aircraft which must operate as a public use aircraft.
  - **The aircraft must be a military (or other public use) aircraft that needs to carry and operate the equipment for which civil limitations are imposed.**
Levels of FAA Approval

• Installation Approval: Military Use Only (limitations)

• Examples:

Aircraft Self Defense Systems
Aircraft Survivability Systems
Military IFF transponders
NVIS/NVG Cockpit lighting system
Military Mission Equipment
Military Tactical Radios
Military Training Systems
Levels of FAA Approval

- **Safe Carriage**
  - Installing military systems and/or equipment for “safe carriage” is a partial approval, signifying that installation of the military hardware and equipment comply with applicable regulations in a non-functional state. The requirements are:
    - The FAA examines the physical aspects of the installation including aerodynamic effects, structural provisions, cabin safety, and weight and balance.
    - Type design data must include physical and dimensional definition of the installed hardware.
    - Approval includes any modifications made to aircraft structure or systems to accommodate installation of the equipment. **Approval does not authorize or allow the installed equipment to operate.**
    - **Equipment must be disconnected from power sources, antenna couplers, and other interfaces with the aircraft** and these interfaces on FAA type design are safely capped and stowed.
    - **Cockpit controls that are not included as part of the type design**, if the equipment is controlled or will interface with the cockpit.
    - **The FAA type design may require blanking plates or other means to show that the equipment is not approved for function**, and cannot be enabled or operated from the cockpit.
    - The **equipment is not covered in the airplane flight manual supplement**
    - Maintenance and ICAW covers only that required for aircraft provisions (structure, mounts, wiring, etc.) removal, and physical attachment for securing equipment to the aircraft.
    - “**Safe Carriage**” approvals cannot be extended to weapons, pyrotechnics, or any other hazardous materials that would otherwise be prohibited from carriage on a commercial aircraft.
    - The receiving military airworthiness authority is responsible for design approval, equipment qualification, system integration, compatibility, functionality, and interface with aircraft systems, operation, and airworthiness approval for the installed equipment.
Levels of FAA Approval

• **Safe Carriage**

• **Examples:**

  *Military Mission Equipment*
Levels of FAA Approval

• **Provisions Only**

Provisions Only approvals are not on-board installation approvals for the military equipment. They allow modifications or define limits for later approved military installations. Provisions Only approvals assess and approve aircraft structure, design characteristics, or system capabilities to handle defined and predetermined structural loads, interface or attachment provisions, and electrical power requirements. The requirements for Provision Only approvals are:

- Accurately define the criteria for which the provisions are designed.
- Provide evidence to support relevant compliance findings with applicable civil regulations.
- Addressed in the airplane flight manual and instructions for continued airworthiness to operate and maintain the FAA approved type design configuration.
- Include the specific criteria for which the provisions are approved on the description of the type design change, or reference a document that establishes all interface points and design limits.
- Ensure that the receiving military airworthiness authority can incorporate further modification to the aircraft using the approved provisions criteria.
Levels of FAA Approval

- **Provisions Only**

- **Examples**

  Structural and/or electrical/wiring system modifications for large antennas, radome, equipment pods, equipment installs, etc.

  Radomes, large antennas, equipment pods
Questions ?