DEPARTMENT OF THE AIR FORCE
Headquarters Air Force Life Cycle Management Center (AFLCMC)
Engineering Directorate
Wright-Patterson AFB OH 45433-7101

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# AIRWORTHINESS CIRCULAR

## Federal Aviation Administration Airworthiness Certification Process Overview

### PURPOSE:

This USAF airworthiness (AW) circular (AC) provides an overview of the Federal Aviation Administration's (FAA) AW certification process and products.

### SCOPE:

This AC covers aircraft which receive an FAA AW certification.

### ATTACHMENTS:

1. Abbreviations and Acronyms

### CANCELLATIONS:

Not applicable. This is the first issuance of this AC.

### REFERENCED DOCUMENTS:

1. FAA Order 8130.2J, Airworthiness Certification of Products and Articles
2. FAA Order 8110.4, Type Certification
3. FAA Order 8110.101A, Type Certification Procedures for Military Commercial Derivative Aircraft

### DISCUSSION:

This AC provides an introductory overview of the FAA AW certification process and FAA AW Certificates. Official FAA information is found in 14 CFR, FAA Orders, FAA Advisory Circulars and other information that can be found at www.faa.gov. Recommendations are included for the review of FAA AW certification products for use in a USAF AW approval.

1. **FAA AW DEFINITION:** 14 CFR Part 3.5 and FAA Order 8130.2J, *Airworthiness Certification of Products and Articles*, define "airworthy" as the aircraft must conform to its design and be in a condition for safe operation.

1.1. Conforming an aircraft means to verify a specific aircraft is in a configuration which has been approved with a Type Certificate (TC) and, if applicable, an amended TC (ATC) and/or Supplemental Type Certificates (STCs). This includes conformity to applicable ADs, major repairs, and major alterations. Minor repairs must conform to FAA-accepted data.

1.2. In a condition for safe operation is generally meant to include the proper routine

maintenance, completion of condition inspections, approval of STC installations, approval of major/minor alterations/repairs, and that approved ground and flight procedures are available.

2. **FAA TYPE CERTIFICATION PROCESS:** The FAA's type certification process encompasses both the design and manufacturing of the physical aircraft, engine, or propeller and the technical data for the operation and maintenance of the same. The FAA type certification process is defined in FAA Order 8110.4 and is supplemented for military commercial derivative aircraft in FAA Order 8110.101A. The following categories describe the processes under which the design changes to the aircraft configuration can be approved:

2.1. Type Certificate (TC): The official document provided by the FAA to the applicant that indicates their aircraft, engine, or propeller design meets all the appropriate 14 CFR requirements. A TC is supported by documentation developed during the design and manufacturing process (i.e., stress reports, parts drawings, etc.). Operations and maintenance manuals (pilot operating handbooks, parts lists, structural repair manuals, etc.) also support the TC. Only some of this documentation is provided to the owner/operator of the aircraft, engine, or propeller. Top level textual summary (weights, engines, fuel, etc.) are given in the Type Certification Data Sheet (TCDS) maintained by the FAA and available at www.faa.gov.

2.2. Amended Type Certificate (ATC): An official revision to the TC given to the TC holder stating that the holder's aircraft, engine, or propeller's design modification meets all the appropriate 14 CFR requirements. ATC's are commonly used for engine changes, optional equipment, landing gear changes, and gross weight increases.

2.3. Supplemental Type Certificate (STC): A modification to the original aircraft, engine, or propeller that can range from a change of limitations (service life extension, approval of additional fuel, etc.) to a physical change to the aircraft, engine, or propeller. An approved STC meets the appropriate 14 CFR requirements. Installation of an STC is documented on an FAA Form 337, *Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance).* An aircraft can have multiple STCs installed. Furthermore, an STC may be amended by the STC holder, similar to how TCs may be amended.

2.4. Major Alteration: A change to the aircraft, engine, or propeller parts listed in 14 CFR Part 43; Appendix A (e.g., wings, tail surfaces, gross weight, etc.). It is done to a single aircraft and is documented on an FAA Form 337, colloquially known as a Field Approval. A major repair or alteration typically requires final inspection, installation approval, and signoff by a FAA Flight Standards Inspector (signature in Block 1 of the Form 337) but may be delegated to an airworthiness designee, Designated Airworthiness Representative (DAR). A major repair or alteration is supported by approved data; engineering approval and compliance findings are made by a Designated Engineering Representative (DER) of the FAA with authority to approve data for that specific purpose. A DER will analyze the alteration, manufacturer's type design, lab/field testing results, and approve supporting data with an FAA Form 8110-3, *Statement of Compliance with Airworthiness Standards.*

2.5. Major Repair: A repair made to one of the major components of an aircraft, engine, or propeller as listed in 14 CFR Part 43, Appendix A and is documented on an FAA Form 337. The scope of oversight and approval mirrors a Major Alteration.

2.6. Minor Alteration: An alteration to an aircraft, engine, or propeller not listed in 14 CFR Part 43, Appendix A. A maintenance log book entry is required by a licensed FAA Aircraft and/or Powerplant Mechanic.

2.7. Minor Repair: A minor repair is a repair to an aircraft, engine, or propeller not listed in 14 CFR Part 43, Appendix A. A maintenance log book entry is required by a licensed FAA Aircraft and/or Powerplant Mechanic.

3. **FAA AW CERTIFICATES:** All U.S. civil registered aircraft must possess an FAA-issued AW Certificate. The FAA AW Certificate is a physical piece of paper issued by a representative of the FAA after the aircraft completing inspection. The FAA AW Certificate must be displayed in the aircraft visible to passengers and crew when the aircraft is operated. The two types of AW Certificates are a Standard and a Special as defined in FAA Order 8130.2J.

3.1. FAA Standard AW Certificate: A Standard AW Certificate is for an aircraft which has been issued a TC. The AW Certificate is valid as long as the aircraft is maintained and operated in accordance with applicable 14 CFR requirements.

3.2. FAA Special AW Certificates: Special AW Certificates are used for a wide variety of purposes as described in FAA Order 8130.2J, Chapter 4. They cover aircraft, engines, or propellers that have not been certified by the FAA against all the applicable 14 CFR requirements. The classifications of Special AW Certificates include primary, limited, provisional, special flight permit, restricted, light sport, and experimental.

3.2.1. Experimental AW Certificates may be issued to both FAA TC and non-FAA TC aircraft. These Certificates are for one of the following purposes: research and development, show compliance, exhibition, market survey, crew training, air racing, and amateur built. In general, aircraft with an Experimental AW Certificate are restricted from carrying persons or property for compensation and hire.

3.2.2. A Restricted category aircraft has the following potential purposes: agricultural, forest and wildlife conservation, aerial surveying, patrolling, weather control, aerial advertising, and other operations specified by the FAA.

3.2.3. Non-Type Certified aircraft (e.g., former military aircraft) do not possess an FAA approved design and do not have FAA approved documents supporting continued AW. Non-Type Certified aircraft may be eligible only for an Experimental AW Certificate.

3.2.4. Both experimental and restricted categories may include additional operating limitations, beyond those documented in the technical data, which impose requirements or limits on the operation and maintenance of the aircraft.

**RECOMMENDATIONS:**

The following are TAA and Delegated Technical Authority (DTA) considerations when deciding whether to issue an AW approval. The responsible Program Office requesting a USAF AW approval should address these considerations during the AW review.

1. The TAA or DTA assess if the aircraft is in a condition for safe operation through a review of AW Certificates, maintenance records, and FAA Form 337s. It is recommended that an on-site inspection of the aircraft be conducted by someone familiar with FAA processes.

2. The TAA or DTA should ensure that the FAA AW approvals have been obtained through a complete FAA approval process.

3. The TAA recognizes FAA TCs and STCs as evidence an aircraft type design meets the FAA AW certification requirements. The USAF TAA does not require separate or redundant evaluation of the engineering data approved by the FAA when issuing TCs, ATCs, and STCs.

4. Some contractors operate aircraft with an FAA AW Certificate containing installed equipment that cannot be operated under civil regulations. In order to operate the equipment, the contractor must obtain additional authorizations, such as a declaration of Public Aircraft Operations (PAO), authorization from a Flight Standards District Office or a different FAA AW Certificate. The TAA or DTA should verify all authorizations needed for the operation are obtained.

5. The USAF TAA recognizes FAA Special AW Certificates (FAA Form 8130-7) only when evidence exists that the aircraft is in a condition for safe operation and modifications were designed and installed using standards and procedures acceptable to the USAF TAA.

6. The existence of an FAA Special AW Certificate may indicate the aircraft design configuration and/or operating intent is not fully certified within FAA regulations. It may also indicate aircraft modifications which were not sufficiently evaluated (with approved documentation) by appropriate FAA representatives. The TAA or DTA should pay particular attention to any modifications installed with just an FAA Form 337 as the scope of the work and oversight may be determined by an FAA mechanic with an IA.

7. The TAA or DTA assess the aspects of the aircraft and/or operation baseline that drove the need for the FAA Special AW Certificate focusing on the design, manufacturing, operations and maintenance. The TAA or DTA should closely examine aircraft documentation including the AW Data Package, FAA Form(s) 337, FAA Form(s) 8110-3, and other records and substantiating analyses that support the aircraft configuration and operation. Attention should be given to the validation of this data and with any limitations, restrictions, or conditions imposed. It is the TAA or DTAs responsibility to ensure sufficient substantiating data exists to support the AW approval.

8. Some aircraft may have multiple AW Certificates issued to them. In contracted air services, the operating limitations issued will have explicit instructions on how and when the aircraft can be moved from one Certificate to the other and then back again.

9. Aircraft, engines, or propellers lacking an FAA Type Certification does not mean the design, manufacturing, operations, and maintenance do not have a safe and sound design basis. It does place a greater oversight burden on the TAA or DTA conducting the AW assessment.

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## Attachment 1

## Abbreviations and Acronyms

**AC –** Airworthiness Circular
**ACO –** Aircraft Certification Office
**AD –** Airworthiness Directive
**ATC –** Amended Type Certificate
**AW -** Airworthiness
**CFR –** Code of Federal Regulations
**DTA –** Delegated Technical Authority
**FAA –** Federal Aviation Administration
**IA –** Inspection Authorization
**PAO –** Public Aircraft Operations
**STC –** Supplemental Type Certificate
**TC –** Type Certificate
**TCDS –** Type Certification Data Sheet