

FAA Production Certification / Approval



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Presented to: NASA Aeronautics Research Institute

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Objective:

Provide a familiarization of the following:

- **Applicable Definitions**
- **Production Approval (PC, PMA, TSOA)**
- **Part Manufacturer Approval (PMA)** (Emphasis on PMA)
 - Basis for FAA Design and Production Approval
 - Applicant and FAA collaboration to ensure timely issuance of production approval
- **Quality System Requirements**
- **Application Process**
- **Privileges and Responsibilities**
- **Manufacturing facilities located outside the United States**
- **Regulatory References and Resources**



Applicable Definitions

- **Product.** An aircraft, aircraft engine, or propeller.
- **Article.** A material, part, component, process, or appliance.
- **Production Approval Holder (PAH).** The holder of a PC, PMA, or TSO authorization who controls the design and quality of a product or article(s). *A person who has been issued a production certificate or approval by the FAA.*
- **Manufacturer.** A person, as defined by 14 CFR part 1, who causes a product or article(s) to be produced. *A manufacturer may be a PAH or a supplier to a PAH.*
- **Supplier.** Any person, as defined by 14 CFR part 1, that provides a product, article, or service, at any tier in the supply chain, that is used or consumed in the design or manufacture of, or installed on, a product or article.



Applicable Definitions (cont)

- **Quality System.** A documented organizational structure containing responsibilities, procedures, processes, and resources that implement a management function to determine and enforce quality principles.
- **Quality System Data.** Data that provide a description of the quality system required by part 21 for a PAH. These data would encompass the methods, procedures, processes, inspections, tests, specifications, charts, lists, forms, etc., which the PAH employs to produce products or articles.
- **Authorized Release Document.** A certifying statement by a PAH that a given aircraft engine, propeller, or article (1) conforms to its approved design data or properly altered condition, **and** (2) is in a condition for safe operation at the time of examination and release of the document.



Production Approval

A **Production Approval** is a document issued by the FAA to a person that allows the production of a product or article in accordance with its approved design and approved quality system, and can take the form of a Production Certificate (PC), Part Manufacturer Approval (PMA) or a Technical Standard Order Authorization (TSOA)



Production Approval (cont)

Production Certificate (PC)

- The approval of an applicant's quality system to produce aircraft, aircraft engines, propellers, or articles that replicate an FAA approved design.
- Documented on FAA Form 8120-4 Production Certificate and 8120-3 Production Limitation Record
- Prerequisite:
 - ✓ A current **Type Certificate**, or
 - ✓ The right to use a type certificate under **licensing agreement**, or
 - ✓ A supplemental type certificate (**STC**)



Production Approval (cont)

Technical Standard Order Authorization (TSOA)

is a combined design and production approval

- Used to produce an article designed to meet a minimum performance standard called a “Technical Standard Order (TSO)”
- Documented on a TSO Letter of Authorization
- Two types of approval:
 - **TSOA** – United States is State of Design (SOD) and State of Manufacture (SOM)
 - **LODA** – (letter of TSO design approval) – Another country is SOD and SOM



Production Approval (cont)

Parts Manufacturer Approval (PMA)

Is a combined design and production approval

- Used to produce replacement or minor modification articles for sale to the public (for installation on type certificated aircraft)
- Documented on a PMA Letter and PMA supplement listing the approved articles by part number and installation eligibility.
- Design approval based on one of the following:
 - Test Reports and Computations
 - Identity (without a licensing agreement)
 - Identity with evidence of a licensing agreement
 - Supplemental Type Certificate



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Part Manufacturer Approval (PMA)

4 basis of design approval:

- **Test & Computations** - the proposed design complies with the applicable regulations/airworthiness requirements, but does not have to be identical to the TC, STC or TSO design.
- **Identically** (without licensing agreement) - the PMA applicant's design is the same in every respect to an article's design of that from a TC, STC or TSO.
- **Supplemental Type Certificate** – The STC is the FAA approved design data.
- **Identically by way of Licensing Agreement** – provide a document (licensing agreement) from the holder of the TC, STC, TSO authorization, authorizing use of its FAA-approved design data.



Part Manufacturer Approval (PMA) (cont)

Familiarization, Collaboration, Understood Expectations = Success

- Initial dialog between applicant and FAA may take place prior to formal application
- Communication and collaboration sets the stage for building relationships, aligning goals, timelines and ensuring FAA resources are available to support
- Expectations of both the FAA and Applicant should be clearly understood and agreed to



Quality System Requirements (§21.137)

Each applicant for or holder of a production certificate must establish a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation.

This quality system must include:

- (a) Design data control.
- (b) Document control.
- (c) Supplier control.
- (d) Manufacturing process control.
- (e) Inspecting and testing.
- (f) Inspection, measuring, and test equipment control.
- (g) Inspection and test status.
- (h) Nonconforming product and article control.
- (i) Corrective and preventive actions.
- (j) Handling and storage.
- (k) Control of quality records.
- (l) Internal audits.
- (m) In-service feedback.
- (n) Quality escapes.
- (o) Issuing authorized release documents.



Application Process

- **PC** - Submit FAA Form 8110-12 to the local Manufacturing Inspection District Office (MIDO).
- **PMA** - 2 possible paths, depending on means of identity:
 - *By Test Reports and Computations or Identity without a Licensing Agreement- submit application package to local Aircraft Certification Office (**ACO**)*
 - *By Identity with a Licensing Agreement or Supplemental Type Certificate- submit application letter and quality manual to local **MIDO***
- **TSOA** - submit Application Letter and Quality Manual to local Aircraft Certification Office (ACO)

(FAA Order 8120.22A, 8110.42D, 8150.1D)



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Application Process (cont)

- Applicant develops a quality system that meets the requirements of the regulations
 - Quality system is **scalable** based on risk-level of product or article
- Applicant provides a copy of the documented quality system to the FAA MIDO for review (**Quality Manual**)
- FAA reviews quality manual for compliance to regulations
- FAA performs a **MIDO Audit** of the applicants quality system
 - FAA verifies applicant is operating per quality manual requirements
 - FAA performs a **Product Audit** to assure that the product or article meets the type design



Privileges and Responsibilities

Privileges of a PAH

- **PC Holder**
 - Obtain an airworthiness certificate for a product without further showing
 - May have individuals appointed to act on behalf of the FAA
- **PMA Holder**
 - Produce articles for use on type-certificated products
 - May have individuals appointed to act on behalf of the FAA
- **TSOA Holder**
 - Produce articles for use on type-certificated aircraft
 - May have individuals appointed to act on behalf of the FAA



Privileges and Responsibilities (Cont)

Privileges of a PAH

Designee/Delegation System

- 14 CFR Part 183 allows PAH's the ability have individuals appointed by the FAA to perform FAA functions on behalf of the FAA
 - Designated Manufacturing Inspection Representative (**DMIR**)
 - Designated Engineering Representative (**DER**)
- Part 183 also allows an organization to apply for appointment as an organization to perform FAA functions on behalf of the FAA
 - Organization Designation Authorization (**ODA**)



Privileges and Responsibilities (cont)

Responsibilities of a PAH

Organization – Accountable Manager

- Organization must identify the applicant's or PAH's accountable manager.
 - Serves as a PAH's **primary contact** with the FAA
 - **Responsible for**, and has authority over, **all production operations** conducted under part 21
 - **May delegate functions** and identify alternate points of contact



Privileges and Responsibilities (cont)

Responsibilities of a PAH

- Amend the quality document to reflect changes in the organization and present it to FAA
- Maintain the quality system in compliance with the approved data and procedures
- Ensure each completed product or article conforms to approved design and is in condition for safe operation
- Mark the product or article in accordance with 14 CFR Part 45



Privileges and Responsibilities (cont)

Responsibilities of a PAH

- Retain its production approval and make it available to the FAA upon request
- Allow access for FAA to all PAH and supplier facilities
- Identify any sub-assemblies, component parts, or replacement articles that leave the manufacturer's facility as FAA approved with the manufacturer's part number and name, trademark, symbol, or other FAA approved manufacturer's identification



Privileges and Responsibilities (cont)

Responsibilities of a PAH

- Have access to type design data necessary to determine conformity and airworthiness for each product and article produced under the production approval
- Make available to the FAA information regarding all delegation of authority to suppliers
- Report any failures, malfunctions or defects to the FAA per §21.3
- Correct any unsafe conditions as dictated by Airworthiness Directives per §21.99



Manufacturing facilities located outside the United States

A PAH may utilize manufacturing facilities located outside the United States if the FAA finds no undue burden in administering the applicable requirements of Title 49 U.S.C

- Promote civil aviation and SAFETY
- Oversight/Surveillance

An undue burden is a determination made by the FAA that a proposed activity outside the United States, requiring FAA support, will exceed available FAA resources.



Regulatory References and Resources

14 CFR Part 21, Certification Procedures for Products and Articles

- Subpart G, Production Certificates
- Subpart K, Parts Manufacturer Approvals
- Subpart O, Technical Standard Order Approvals



Regulatory References and Resources (cont)

FAA Directives/Orders

- **8120.22A** Production Approval Procedures
- **8110.42D** Parts Manufacturer Approval Procedures
- **8150.1D** Technical Standard Order Program
- **8100.11D** Requirements for finding undue burden and no undue burden under 14 CFR Part 21



Regulatory References and Resources (cont)

Advisory Circulars

- **AC21-43A** Production under Title 14 CFR Part 21
- **AC21-46A** Technical Standard Order Program
- **AC21-55** Process to support FAA finding of Undue Burden
- **AC-21-303-4** Application for PMA via Test & Comp or Identicality

FAA web-sites:

http://www.faa.gov/aircraft/air_cert/production_approvals/

http://www.faa.gov/aircraft/air_cert/design_approvals/pma/



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