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FEDERAL AVIATION ADMINISTRATION**

National Policy

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SUBJ: Parts Manufacturer Approval Procedures

In this order, we describe the procedures for evaluating and issuing a parts manufacturer approval (PMA) for replacement and modification parts on type-certificated products. These procedures apply to all engineering personnel in the Federal Aviation Administration. The associated procedures for manufacturing personnel are now in FAA Order 8120.2, *Production Approval and Certificate Management Procedures*. This revision consolidated customer and stakeholder feedback to refine the previous guidance, improve clarity and make opportune corrections. Also this revision makes timely adjustments for the new privileges of delegated organizations in PMA.

/s/

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Chapter 1. Purpose and Administrative Information

1. Purpose of This Order. This order prescribes the responsibilities and procedures for approving replacement and modification parts for installation on type-certificated products. It applies to Federal Aviation Administration (FAA) aircraft certification personnel and organizational designees under Organization Designation Authorizations (ODA) who implement the approval process required by Title 14 of the Code of Federal Regulations (14 CFR). We define the procedures that FAA personnel follow when issuing a parts manufacturer approval (PMA) under 14 CFR § 21.303. We also explain how an applicant applies for a PMA and describe the role of a designated engineering representative (DER) in the PMA process. FAA Order 8120.2, *Production Approval and Certificate Management Procedures*, contains the guidance for evaluation, approval, and certificate management for the production activities of manufacturers and their suppliers who produce parts under PMA.

2. Audience. All FAA employees, ODA, and designees who use the approval process for issuing a PMA.

3. Where Can I find This Order? You can find this order on the Regulatory and Guidance Library website: www.rgl.faa.gov.

4. Cancellation. FAA Order 8110.42B, *Parts Manufacturer Approval Procedures*, dated September 9, 2005 is canceled.

5. Who Needs A PMA?

a. General Requirements. Title 14 of the Code of Federal Regulations (14 CFR) § 21.303(a) requires any person producing replacement or modification parts for sale for installation on a type-certificated product to get a PMA. A PMA is a combined design and production approval for replacement parts. Also we may use a PMA for the production of modification parts from supplemental type certificates (STC). The prior STC approves the design and installation of these modification parts in products. However, if any replacement part alters a product by introducing a major change, then 14 CFR § 21.113 requires an STC for the approval of these parts. See FAA Order 8110.4, *Type Certification*, for STC procedures.

b. Getting a PMA for Technical Standard Order (TSO) Articles. We at the FAA may issue a PMA for replacement parts for articles produced under a TSO authorization when these articles are in the **product's** type design. Then the replacement part is for the eligible product not the article. The installation of a PMA part may result in a minor design change in a TSO article yet meet the product's airworthiness requirements. We require the installer of this part to place a modifier's nameplate on the article. See FAA Order 8150.1, *Technical Standard Order Program*, for more details. Replacement parts approved under the basis of identity do not change the article's design and do not require a modifier's nameplate.

6. What are the Exceptions to PMA?

a. Procedures and Materials. PMA is not for the approval of inspection procedures, materials or processes. Any specific inspection procedures, materials, or processes (such as

hardening, plating, or shot peening) approved as part of a PMA are valid only for that particular part. Any person performing only specialized processes or procedures on parts intended for installation on type certificated products must do so within production or other approvals for those parts.

b. ‘One-Time Only’ STCs. Parts produced under a “one-time only” STC or a field approval are ineligible for a PMA. Modifiers with these design approvals may manufacture, install and return only one product to service without benefit of a PMA. Otherwise we **require** the applicant to get a PMA or another production approval for the associated parts when sold to others.

c. Other Production Approval Holders (PAH). Holders of a production certificate, approved production inspection system, or TSO authorization do not need a PMA to produce replacement parts for their products or articles under their existing design and production approvals. If a supplier to a production approval holder (PAH) intends to sell a part without direct ship authority, then that supplier needs a PMA.

d. Aircraft Owners or Operators. Owners and operators may produce parts for installation on their own product without a PMA. The installation of these parts must comply with applicable airworthiness standards. If an owner or operator intends to sell a part for installation on another owner’s aircraft, then that owner or operator requires a PMA.

e. Air Carriers Operating Under 14 CFR part 121 or 135. Carriers may produce parts for installation on their own products without a PMA. We don’t require a PMA if the air carrier has accepted instructions and procedures in their manual. Also, the installation of the part must comply with 14 CFR Part 43. If air carriers intend to sell a part to other owners or operators, then they need a PMA.

f. Repair Stations. An FAA-certificated repair station may fabricate a part for installation on a type-certificated product for current and anticipated in-house repairs. See AC 43-18, *Fabrication of Aircraft Parts by Maintenance Personnel*, for further guidance. We don’t authorize separate sales of these fabricated parts to others.

g. Producing and Selling Standard Parts. Production and sale of standard parts for type-certificated products do not require a PMA. These parts conform to established industry or U.S. specifications. However, a PAH may buy standard parts, subject them to more restrictive inspection criteria and then assign new part numbers. These parts are no longer standard parts. If questions arise, contact the certificating aircraft certification office (ACO), manufacturing inspection district office (MIDO), or both to determine if the part design meets the criteria for standard parts.

h. Importing Modification and Replacement Parts. Under 14 CFR § 21.502, we allow foreign manufacturers to export modification and replacement parts to the United States if an applicable bilateral agreement exists. This agreement defines the scope and manner of the FAA’s acceptance. We expect foreign manufacturers to include documentation of airworthiness with these exported parts. Other acceptable replacement and modification parts from foreign countries with bilateral agreements include:

(1) Parts produced by a foreign holder of an FAA type certificate (TC), STC, or letter of TSO design approval (LODA) on a foreign state of design product , or

(2) Parts produced by a foreign manufacturer, holding a production approval from the bilateral partner Civil Aviation Authority (CAA), for U.S. State of Design products produced under a licensing agreement with the design approval holder.

(3) Parts that have PMA from a foreign airworthiness authority and are recognized in a bilateral agreement with us.

7. Fabrication Inspection System (FIS). We only issue and expand PMAs with a FIS in the United States. However, PMA holders may have suppliers with manufacturing facilities outside the United States. The FIS prescribes the holders' controls for these supplier parts. See the description of a FIS in Order 8120.2.

8. PMA and Older Products. Approval of parts in older products may present potential problems due to incomplete design data, out-of-production products, and defunct type certificate holders. For these problems, we still expect applicants to send us enough information to support their claim that the prospective PMA design meets applicable airworthiness standards. This information should match the required information listed in chapter 2 in this order, as appropriate to the nature of the part. Also, we still require the applicant to show the ability to produce parts conforming to an approved design. We will allow some changes in the approved designs that include later industry-adopted standard practices and specifications that are directly applicable.

9. The Roles of the FAA and Applicant. Figure 1, in this chapter, summarizes the roles of the FAA and an applicant. Coordination (for example, requests for conformity inspections to determine reproducibility) between the ACO and MIDO ensures that the applicant's processes produce replacement and modification parts following the approved design. When appropriate, the MIDO verifies the applicant's manufacturing processes achieve the approved design characteristics. Approval of a PMA application requires the ACO to approve the design, and the MIDO to approve the production system. See appendix A, PMA Process Flowchart.

10. Project Specific Certification Plan (PSCP). A project specific certification plan (PSCP) is the preferred project management tool that aids in the design approval of complex and critical parts. It provides milestones, performance measures, and information unique to a certification project. The adaptive use of a PSCP in PMA applications will define and document the approval plan between an ACO and the applicant. The plan should help us issue a PMA quicker by defining the design approval criteria and process. The ACO and applicant should tailor the plan based on the complexity and criticality of the proposed part. See appendix B, Project Specific Certification Plan, for a PSCP template. Also an ACO may use selective parts of this template for simpler, non-critical parts to summarize PMA application data.

11. Deviations. Engineering and manufacturing personnel in the FAA must follow the procedures in this order and Order 8120.2 to ensure a standard process for PMA. We also must ensure applicants are aware of these procedures. The Aircraft Engineering Division (AIR-100) coordinates and dispositions any deviations from this order. If a deviation becomes necessary, the involved FAA employee substantiates and documents the need, gets concurrence from the

appropriate supervisor, then sends a deviation request for review with recommendations to AIR-100.

12. Acronyms. See appendix L, List of Acronyms.

13. Definitions. See appendix M, Definitions and Terms.

Figure 1. Roles of FAA and Applicant In PMA Process

Applicants:	ACOs:	MIDOs:
<ul style="list-style-type: none"> • Show that the design meets the applicable airworthiness standards by either of the following two ways: <ul style="list-style-type: none"> (1) Showing that the PMA part's design is identical to the design of a part that is covered under a TC, or (2) Using test and computation that shows the PMA part's design meets the airworthiness requirements that apply to the affected product. • Set installation eligibility. • Ensure the part performs its intended function. • Provide a plan for continued operational safety (COS). • Determine part criticality by assessing the consequences of PMA part failure on the next higher assembly and associated product. • Provide instructions for continued airworthiness (ICA) for the PMA part or product as necessary. • Set up and maintain a FIS to meet the requirements of 14 CFR § 21.303(h). • Report service difficulties. • Draft a PSCP if applicable. <p>See chapter 2 for more details.</p>	<ul style="list-style-type: none"> • Ensure compliance with agency regulations, programs, standards, and procedures on issuing design approval for replacement and modification parts. • Coordinate and participate in developing a PSCP as needed. • Investigate service difficulties. • Witness or delegate various functions. • Review COS plan. • Coordinate with aircraft evaluation group (AEG) for ICA review as needed. • Notify applicant of design approval. • Forward application package to the MIDO after design approval. <p>See chapter 3 for more details.</p>	<ul style="list-style-type: none"> • Process PMA applications based on license agreements and STCs. • Ensure conformity to the approved design. • Issue PMA supplements after design approval and FIS validation. • Accept FIS. • Investigate service difficulties • Issue the FAA-PMA production approval letter. • Conduct surveillance at the PMA holder's and supplier's facilities, both foreign and domestic. • Investigate and submit enforcement reports when PMA holders and non-PMA holders do not comply with 14 CFR. <p>See FAA Order 8120.2 for more details.</p>

Chapter 2. What to Expect From Applicants

1. Who Gets an Application Letter? Expect the applicant to send a letter of application to one of the following:

- **The MIDO** in the geographic area of the applicant's manufacturing facility, if the applicant is applying for a PMA based on an STC or identity by a licensing agreement. See a sample letter to the MIDO in Figure 9 of Order 8120.2, *Sample FAA-PMA Letter of Application to MIDO*. We list contact information for all MIDOs in appendix C, List of FAA Manufacturing Inspection District/Satellite Offices.
- **The geographic ACO**, if the design approval basis is identity without a license agreement or test and computation. Find a sample letter to the ACO in appendix D, *Sample FAA-PMA Letters of Application to ACO*. We list contact information for all geographic ACOs in appendix E, List of FAA Aircraft Certification/Field Offices.

2. Content of Application Letter. Each letter will include the manufacturing facility's name and physical address. Also, the letter will identify the part under consideration for PMA. Other necessary information in the letter includes:

- Identity of the type-certificated product for installation of the PMA part. Note the make, model, series, and (if appropriate) serial number of this product as recorded on the upper right-hand corner of the product's type certificate data sheet (TCDS).
- For replacement parts, the identity of the TC holder's part, including the part's name and number. If known, the applicant identifies the drawing number and revision level of this original part.
- Optional request for a PSCP if the application is for the design approval of a complex or critical part. Inform applicants they can submit a draft PSCP using appendix B as a guide. Use of the PSCP is at the reviewing ACO's discretion.
- Statement that certifies the applicant has an established FIS that meets requirements of 14 CFR § 21.303(h).
- Brief description of the basis for a design approval.
- Draft PMA supplement.

3. Basis for Design Approval. These methods are:

a. Identity by Showing Evidence of a Licensing Agreement.

(1) The applicant sends the appropriate MIDO document from the TC, STC, or TSO authorization holder authorizing use of their data package. Evidence of a licensing agreement is

not a separate approval method, but is a way to show identity. The applicant uses this evidence to show that the data submitted are FAA-approved and identical to the original part. For FAA purposes, the licensing agreement (in any form) only needs to authorize the applicant to use the specified type design data. See FAA Order 8120.2, Section 5, for more information.

(2) Following the current industry practice, TC holders prepare “assist letters” for applicants to send to the MIDO. This practice meets the requirements of showing evidence of a licensing agreement under 14 CFR § 21.303(c)(4). Find a sample assist letter in FAA Order 8120.2, Figure 10.

(3) PMA Assist Letter. In the assist letter, the licensor (usually a TC holder or a PAH) may identify critical parts to aid MIDO processing of the PMA application.

b. Identity without a Licensing Agreement. The applicant sends the appropriate ACO a statement certifying that the design is identical in all respects to an approved design (for example, TC, STC or TSO authorization). The applicant also provides the data supporting the identity claim for review and approval. These data verify the identity in dimensional and material characteristics, special processes and coatings, and test and acceptance criteria. Identity without access to the original design data is nearly impossible for sophisticated parts with proprietary processes or coatings. Identity to another PMA is unacceptable because 14 CFR § 21.303(c)(4) restricts identity to only parts covered under type certificates.

c. Test and Computation. The applicant sends the ACO a data package for review and approval. This data package describes the part design, which includes materials, processes, test specifications, system compatibility, maintenance instructions, and part interchangeability. The package also includes a test and substantiation plan to show compliance with applicable airworthiness standards. See chapter 2, paragraph 5 for more details about the data package.

d. Supplemental Type Certificate (STC). The applicant stipulates use of the approved data from the STC and refers to the STC number.

4. Draft PMA Supplements. After approving the PMA, we will assign a PMA and supplement number. Use the following samples as guides for preparing FAA-PMA supplements:

- Appendix F, Sample FAA-PMA Supplement for Identity (Non-Licensing Agreement) or Test and Computation, is a supplement based on either identity without a license agreement or test and computation.
- Figure 11 of Order 8120.2, Sample FAA-PMA Supplement for Licensing Agreement and STC, is a supplement based on either an STC or licensing agreement.

5. Applicant’s Data Package. Expect the applicant to provide enough information and substantiation to meet the requirements of 14 CFR §§ 21.303(c), 21.303(d)(2), and 21.303(f). This substantiation shows the part meets the airworthiness requirements in the 14 CFR part (or their predecessor regulations) for the product affected by installation of the part. The data package necessary to meet these requirements will vary in complexity depending on the critical

nature of the part, PMA basis, and its relationship to the mating part, the next higher assembly, and the product. This information must include manufacturing controls, fabrication processes, and assembly techniques as applicable. Additional information can include performance, endurance, and test requirements to show the part meets the appropriate airworthiness requirements. The data package can include, but is not limited to, the following:

a. Drawings and Specifications. Instruct applicants to provide one copy of the drawings and specifications that show part configuration. These drawings and specifications should address dimensions and tolerances, materials, and processes that define the part's structural strength and design characteristics. The required information for critical parts may include routing sheets, tooling requirements, process sheets, material handling and storage, and inspection requirements as deemed necessary by the FAA. The applicant need not provide readily available industry and government standards or specifications unless requested by an ACO.

b. Inspection and Test Procedures. An applicant proposes sufficient inspection and test procedures to affirm the airworthiness of the part design during its manufacture. The complexity and nature of the part sets the scope of these inspections and tests. Critical parts may need demonstration of their manufacturing processes, and inspection and test procedures before approval of their designs. These processes and procedures include process controls, finished product performance, and incoming material controls. The data usually include elements of the manufacturing cycle, such as, raw material purchase, evaluation of material chemistry and grain structure, fabrication, melt practices, forging processes, machining, surface treatments, other material properties, and required inspections. If the application basis is identity, then the applicant includes the necessary manufacturing test procedures to demonstrate these processes and procedures. If the application basis is test and computation, then the applicant includes the design and manufacturing test procedures.

c. Test Results. An applicant provides test results commensurate to the nature of the part's design and its basis for approval. Design approval of critical parts may require the applicant to perform additional inspections and tests. If an applicant uses an FAA-approved test plan, we review and approve the results. The applicant sends us the resultant inspection and test reports to substantiate the airworthiness of the parts produced in conformity with the proposed design. If the application bases for the critical parts are identity, the applicant provides test results that show their manufacturing methods and processes are the same as the original parts. If the bases for these parts are test and computation or STC, then include both design and manufacturing test results in the data package.

d. Safety Assessment. Expect the applicant to submit a failure mode and effects assessment to support classification of the proposed part as either critical or non-critical. This assessment provides at a minimum:

(1) A qualitative assessment of failure modes and effects, which notes the part criticality and considers:

- Effect of characteristics, processes, maintenance procedures, or inspections when there's a failure, omission, or non-conformance; and
 - Effect of operating outside the part application or intended environment, but within the product's certification limits.
- (2) Effect of part failure on the next higher assembly and its performance.
 - (3) Effect on the product and its performance if the next higher assembly fails.

Note: We evaluate this assessment against the applicable criteria in 14 CFR §§ 33.75, 29.602, 27.602, 25.1309, 23.1309 and *Policy for Propeller Safety Analysis*, Policy No. ANE-2002-35.15-RO of 30 October 2003. Go to the Regulatory and Guidance Library at www.rgl.faa.gov to see this policy memorandum. If the assessment shows hazardous condition from the effects of failure cited in paragraphs 2-5d (1) through (3), then the part is critical.

e. Design Change Control. Applicants describe the methods and controls for changes to the part design. They also describe how to integrate design changes into the manufacturing process.

f. Airworthiness Limitations. Life-limited parts identified in the TCDS or airworthiness limitations section require a method for accurately assessing their fatigue life. This method will include, at least, appropriate aspects of material property distributions, loads, frequency of loads, mission profiles, stress and temperature distributions, and fatigue testing. We expect the applicant to assess the impact of PMA parts on mating life-limited assemblies. Also parts with replacement times, inspection intervals or related procedures in an airworthiness limitation section of a maintenance manual need data that support such.

g. Life Assessment. Type certificate holders often assess the life of parts that operate in cyclic load environments. This assessment occurs during certification through test, analysis, or both. The PMA applicant should also evaluate the life of the proposed replacement part in the cyclic load environment. The evaluation may entail fatigue life analysis and testing. The results verify part life and support instructions for continued airworthiness (ICA) and a continued operational safety (COS) plan.

h. Other Data per 14 CFR parts 34 and 36. Address fuel venting, exhaust emissions and noise standards as appropriate.

i. Continued Operational Safety Plan.

(1) PMA holders are responsible for the continued operational safety of their designs. Regardless of part complexity, PMA applicants, should develop a COS plan. The critical nature of a part sets the scope of this COS plan. This scope addresses problem prevention, part monitoring and problem response. The specific requirements for tracking, reporting and

correcting failures and defects are in 14 CFR §§ 21.3 and 21.99. These requirements include at least:

- Detailed records of all aspects of the manufacturing cycle,
- A record-keeping plan for the entire part life,
- Methods to isolate possible discrepant part populations, continually monitor the service use of parts, and review design assumptions based on service experience,
- Means for identifying possible failure modes and effects that account for the part's operating environment and interfaces to the next higher assembly and product, and
- Methods and resources used to identify causes of failures and to develop corrective actions, and means to carry out these actions quickly based on an assessment of the associated risks.

(2) The PMA holder may establish procedures that address COS within their quality system and note such in a PSCP.

j. Part Marking. The applicant provides detailed part marking information that complies with 14 CFR § 45.15. Life-limited, as well as parts having an inspection interval or related procedures specified in the manufacturer's ICA, require marking that complies with 14 CFR § 45.14. Ensure these markings do not compromise the airworthiness of the part.

k. Installation Eligibility. Expect the applicant to identify where the part goes. If the PMA is for parts from an STC, the installation eligibility follows eligibility requirements in the STC. The PMA supplement will note the models affected by the STC. A copy of the STC is enough to show eligibility. If the part is simple, non-critical, and not based on an STC, then an illustrated parts catalog (IPC) alone may suffice to show eligibility. Otherwise, the applicant must:

- Identify at least one product for possible installation of the part. Identify the product by make and model, series, and serial numbers if necessary. The applicant uses the model information found in the title box on the product's TCDS.
- Show where the part goes through a combination of an IPC, other supplements, service bulletins, and PAH repair manual data.

l. Airworthiness Directives (AD). The applicant identifies all ADs and unresolved service difficulties involving the original part from the type design. Applicants must show their designs do not produce the unsafe conditions noted in ADs and avoid known service difficulties of the respective original parts.

m. Maintenance Instructions and ICA. Applicants furnish instructions for continued airworthiness per 14 CFR § 21.50. This regulation requires a design approval holder to provide ICA prepared in accordance with the airworthiness requirements applicable to the effected product. An applicant either shows and states that the product's ICA are still valid with the PMA part installed or provides a supplemental ICA for any differences. Note that products with a TC application date before January 28, 1981 may not have ICA. Regulations required ICA on later products. Also the applicant provides supplemental ICA when:

- The PMA part invalidates the product's ICA,
- The design approval holder's instructions are inadequate.

n. ICA for Life-limited Parts. If the PMA part is life-limited, the applicant must submit a supplement to the limitations section of the ICA per 14 CFR § 21.50. The supplement identifies the part numbers and associated life limits.

6. Special Requirements for Test and Computation Applications. Applications submitted on the basis of test and computation should specifically address:

a. Compliance with Airworthiness Standards. Applications based on test and computation, either comparative or general test and analysis, must demonstrate compliance with applicable airworthiness standards. These include special conditions that apply to the respective products. The certification basis for the PMA part is the same as the basis for products affected by part installation (see the TCDS). Find minimum performance standards in applicable TSOs and airworthiness requirements in the following 14 CFR parts:

- 14 CFR part 23, Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes.
- 14 CFR part 25, Airworthiness Standards: Transport Category Airplanes.
- 14 CFR part 27, Airworthiness Standards: Normal Category Rotorcraft.
- 14 CFR part 29, Airworthiness Standards: Transport Category Rotorcraft.
- 14 CFR part 31, Airworthiness Standards: Manned Free Balloons.
- 14 CFR part 33, Airworthiness Standards: Aircraft Engines.
- 14 CFR part 34, Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes.
- 14 CFR part 35, Airworthiness Standards: Propellers.
- 14 CFR part 36, Noise Standards: Aircraft Type and Airworthiness Certification.

b. Substantiation. The applicant can prove compliance with applicable airworthiness standards by comparative or general test and analysis. Comparative test and analysis substantiates that the PMA part is at least equal to the approved original part. Thus, the PMA part meets the same airworthiness standards as the original part. General test and analysis shows the part complies directly with all airworthiness regulations applicable to the product affected by part installation. Tests support each type of analysis and confirm significant assumptions, findings or conclusions.

(1) **Comparative Test and Analysis.** Expect the applicant to demonstrate the functional design of the proposed part is at least equal that of the original TC, STC, or TSO part. This method entails analyses and tests of the original and proposed parts. The criticality of the part and the complexity of its design will dictate the rigor of the comparative analysis and the extent of testing. Side-by-side testing of proposed and original parts with zero service time under the same procedures and conditions provide the standard to evaluate the adequacy of the replacement part. The results of the analyses and tests will note any differences and provide sound technical justifications for these differences. Reverse engineering of the original part supports a comparative analysis. However, comparison of the respective PMA and product designs may suffice for simple, non-critical parts.

(2) **General Test and Analysis.** The applicant shows the part complies directly with the product's airworthiness requirements and applicable TSO requirements. For example, certification of a proposed replacement part for an engine by this method would require compliance with all regulations of 14 CFR part 33 applicable to the affected product.

(3) **Test Scope and Plan.**

(a) Part criticality and complexity determines the need, type, and scope of testing to support either a comparative or general analysis. Testing ranges from functional to component to flight. This verifies the performance and durability of the part for compliance with applicable airworthiness standards. Simple, non-critical parts may need little or no testing. Functional testing has many purposes including:

- Verifying design characteristics (for example, vibratory, coating effectiveness, and so on),
- Verifying part interactions with the next higher assembly and affected systems (for example, gears, bearings, seals, blades, and so on), and
- Evaluating complex parts made of intricate components.

(b) If the design warrants testing, applicants include a proposed test plan and a draft request for conformity in their application to the ACO. The test plan identifies at least:

- Test purpose,
- Physical and functional description of the test article and setup,

- Number of test units,
- Unit identification,
- Test conditions and duration,
- Test success and failure criteria,
- Test instrumentation and data collection,
- Test safety control, and
- Control of test procedures.

(c) When appropriate, the ACO issues the MIDO the request for conformity of the test article and test setup. The applicant conducts the tests after receiving FAA approval of the test plan and MIDO approval of the conformity. Either the ACO or MIDO may delegate to authorized designees their respective witnessing of testing, teardown inspections, and conformity inspections. Then, the applicant sends a test report to the ACO that includes an analysis of the test results, the post-test teardown inspection results, and a determination of adequacy to the applicable airworthiness or test standards.

(4) **Flight Testing.** Any flight tests that require an FAA test pilot or designee will need a prior approved type inspection authorization.

(5) **Test Standards.** Expect applicants to use one of the following test standards to measure the adequacy of the PMA part:

- **Comparative Testing.** They use parts from the TC or STC holder that have zero service time. They also test the TC or STC part under the same procedures and conditions as the applicant's part.
- **General Testing.** They verify the part meets the applicable airworthiness requirements of 14 CFR and if applicable, the TSO performance requirement.
- **Other tests** deemed acceptable by the FAA.

c. Reverse Engineering. The reverse engineering process uses techniques that vary widely and produce diverse results. An applicant's challenge entails selecting the processes and techniques that are appropriate to the part's complexity. Dimensional comparison by itself is usually inadequate to characterize and compare a new original part to a proposed replacement. However, reverse engineering may duplicate simple parts. Complex parts need other substantiating information to show equivalency between original and PMA parts. The applicant usually considers the following when using reverse engineering:

(1) **Sample Size.** Typically these samples are new, unused parts from approved and traceable sources (for example, purchase orders, FAA airworthiness tag, and so on). The sample

size varies with design complexity and key attributes that define a part. Use enough samples to correctly represent the essential characteristics of a design. These essential characteristics include nominal dimensions, tolerances, material properties, and fabrication processes. Sampling used parts may provide some characteristics that do not deteriorate during use, such as material composition, grain size and grain flow. Select samples from separate lots, billets, production runs or other criteria that vary in the population. If production tracking data for a part is unknown, obtain parts from different sources at different times to capture potential sources of variability. Ensure applicants substantiate the validity of this approach and get concurrence from the appropriate ACO. Testing may include more samples to show equivalency between a new original and the PMA part.

(2) **Dimensional Tolerances.** Variations in the sample measurements and accepted engineering practices determine the tolerances in part dimensions. The resulting tolerances for the PMA part should not exceed the minimum and maximum dimensions measured on the sampled approved parts. Exceeding these limits requires further substantiation.

(3) **Materials.** Various tests and documentation from the PAH or supplier define the material composition of a part. Usually the PMA part materials are equivalent to the materials for the original part including the base part, any subparts, added welds, and coatings. However, an applicant may propose and substantiate alternate materials and processes that are at least equivalent. A qualified laboratory can provide thorough destructive testing for at least the following information:

- Composition of each material in the part,
- Material properties (that is, strength and fatigue characteristics, hardness, grain structure, and so on),
- Form of material (that is, casting, forging, bar stock, sheet, and so on), and
- Use of special processes (that is, nitriding, heat treat, shot peening, and so on) and resulting effect on material properties.

(4) **Weight and Mass Properties.** The mass properties of a part are often significant to its function and impact on the associated product. To assess the effects on the next higher assembly and product, the reverse engineering process compares these properties. This assessment accounts for weight differences between the proposed part and the original part to ensure the absence of detrimental effects. For example, a small weight increase in compressor blades can affect disc life.

7. Identity by Other Than Licensing Agreement. If the PMA basis is identity without a license agreement, expect the applicant to show every aspect of the submitted design is identical to a TC, STC, or TSO part including manufacturing processes. Common areas of identity include materials, dimensions, tolerances, finishes, assembly, and special processes. However, allowable changes may include standard industry practices, processes, and

specifications that were updated universally. Also, the applicant submits a safety assessment per chapter 2, paragraph 5d with the substantiation data package.

8. Part Marking Requirements. Title 14 CFR § 45.15 sets the marking requirements for PMA parts installed on TC and STC products and TSO articles. These markings are permanent and legible. They identify the part as FAA-PMA. They also identify the manufacturer, part number, and the affected type-certificated products. If the part basis is an STC, then the shipping document refers to this STC and identifies installation-eligible TC products.

a. Marking Critical Parts. Critical parts also follow the marking requirements in 14 CFR § 45.14. This requirement adds a serial number or equivalent to the part markings. The method for marking a critical part is essential design data that the FAA reviews. The applicant ensures and the ACO confirms the marking location and that the process does not degrade airworthiness. To do this, we require applicants to define the marking location and method on their drawings.

b. Marking an Assembly. Applicants apply PMA part markings required by 14 CFR § 45.15 to the top-level assembly of the approved replacement or modification part. We do not require applicants to mark subassemblies or individual detail parts. For example, if the top-level assembly is a hydraulic pump, mark this assembly accordingly. Marking the detail parts of the pump is optional unless production of these parts occurs under separate PMAs. When PMA holders separately sell detail parts for installation in their approved assembly, they note the information required by 14 CFR § 45.15 on the accompanying shipping documentation. The shipping documentation for individual detail parts of a PMA assembly must contain the information required by §§ 45.15(a)(1) through (3) and must identify the detail parts as a subcomponents of the PMA assembly.. The PMA holder's design data may contain the marking information for detail parts of the assembly. This provides a means of tracing the individual detail parts to their related PMA assemblies.

c. Part Numbering. If the PMA part replaces an original part, the applicant assigns a part number that distinguishes the PMA part number from the corresponding TC holder part number. Adding a prefix or suffix to the TC holder's part number is enough as long as the prefix or suffix does not compromise the TC holder's part marking practices. The applicant may also use a prefix or suffix to satisfy 14 CFR § 45.15(a)(2) requirements for marking the part with a name, trademark, or symbol. This only applies if the prefix or suffix is consistent across the applicant's product line. Also, each part bears "FAA-PMA" to meet another 14 CFR § 45.15 requirement.

(1) **Supplier Numbers.** Some applicants are suppliers to PAHs. Often these PAHs use the supplier part numbers in their approved designs. When these suppliers later apply for a PMA, they may continue to use their original part numbers with the added marking requirements of 14 CFR §§ 45.15(a)(1) and (2). These added requirements entail permanently marking the part with "FAA-PMA," and the name, trademark, or PMA holder's symbol.

(2) **Parts Manufactured Under License.** When the PMA basis is identity by showing evidence of a licensing agreement, the PMA part may have the same number as the type-certificated part. However, we require the applicant to meet the requirements of

14 CFR §§ 45.15(a)(1) and (2) by permanently marking the part with “FAA-PMA” and the PMA holder’s name, trademark, or symbol.

d. Parts Impractical to Mark. If we find the part too small or impractical to mark all the information on it, then an attaching tag or container label must have the missing information. Often the number of eligible type-certificated products is too long to include with the part. Since the list is likely to change, a tag or label on a container may refer to the applicant’s publicly available part eligibility information. Title 14 CFR § 45.15(b) requires making the installation-eligibility information contained in a manual or catalog readily available. Providing a manual or catalog via the Internet meets the intent of “readily available.” However, access to the Internet is not universal. The PMA holder must have an alternative means of providing the manual or catalog.

e. Marking a PMA Part on a TSO Article. Markings for a PMA part that goes on a TSO article follows the same protocols. Title 14 CFR § 45.15 requires the holder to mark parts as prescribed per the approved design. The installation eligibility in these markings notes the name and model of each applicable type-certificated product. To meet the requirements of 14 CFR § 45.15, record the PMA installation-eligibility information (that is, A310-200 series, B737-300 series, and so on) on the part. Do not list the TSO identification information (that is, TSO-C149, TSO-C63C, TSO-C85A, and so on). However, if an applicant holds a TSOA on the same part, then mark the part with both PMA and TSO markings.

9. Use of Designees. Designees expedite the review and approval process for PMA. Holders of ODA perform many of the same functions as ACOs including review of part design, verify conformity, issue supplements, etc. Individual designees approve data within their authorized limitations in support of the PMA process. See Order 8100.15, *Organization Designation Authorization Procedures* and Order 8110.37, *Designated Engineering Representative (DER) Handbook*, as well as, chapter 5 of this order for more information. Applicants without ODA will identify the names and contact information of participating DERs to their responsible ACO in their application letters and PSCP, as applicable.

10. Establishment of the FIS. Title 14 CFR § 21.303(h) requires the applicant to set up and maintain a FIS. See Appendix 2 of Order 8120.2 for more details.

11. Responsibilities of PMA Holders after Approval.

a. Report Failures, Malfunctions, and Defects. PMA holders must comply with 14 CFR § 21.3. The PMA holder creates a procedure to report to the FAA any failure, malfunction, or defect of a PMA part that left its quality control system. At a minimum, this reporting requirement applies to failures, malfunctions, or defects that may result in one of the occurrences listed in 14 CFR § 21.3(c). The data package includes this procedure in the COS plan. We review this procedure during the design approval portion of the PMA.

b. Maintain FIS. We require PMA holders to maintain an accepted FIS to comply with 14 CFR § 21.303. Holders should report to the MIDO any changes in their FIS that may affect the inspection, conformity, or airworthiness of their parts before implementing these changes. The production approval number issued by the MIDO is evidence of an accepted FIS.

c. Designees. After we issue a PMA, the holder can apply for appointment of qualified individuals as designated manufacturing inspection representative (DMIRs) or ODAs per 14 CFR part 183. See Order 8100.8, *Designee Handbook*, and Order 8100.15 for more details.

d. Additional Part or Installation Approvals. A PMA holder can apply for additional approvals for other parts or installations on other products. These applications follow the applicable requirements of this order. The holder still complies with design approval requirements in 14 CFR § 21.303 and marking requirements in 14 CFR § 45.15(a)(4).

(1) When the holder uses an already accepted production system, the ACO still approves the design of the additional part and the MIDO conducts an optional review of the holder's FIS. The MIDO reviews the holder's FIS if production of new parts significantly increases the holder's scope of operations or demands greater manufacturing abilities.

(2) Holders can apply for additional installation eligibility for an approved part on other products. They still show the part meets the airworthiness requirements of these products and demonstrate an understanding where the part goes. See the applicable procedures in this chapter, paragraph 5. Also expect the holder to submit the information about any associated ICA found in this chapter, paragraph 5m. After design approval and FIS review, the ACO will sign and the MIDO will issue a PMA supplement that adds the new parts or installations to the original approval.

(3) Type certificate holders and PAHs often use existing parts in newer/later models of their products. PMA holders of corresponding replacements for these parts usually cite an IPC that notes these common parts in the newer models. For simple, non-critical parts, an unaltered IPC from these holders may be enough to show eligibility. However, for critical or complex parts, additional installation eligibility for an approved part should follow the procedures in this chapter, paragraph 5k.

e. Design Changes.

(1) PMA holders may introduce changes to their designs. Minor changes are those having no appreciable effect on the approval basis. All other changes are major. Holders need prior ACO approval before implementing major changes. However, we and PMA holders may agree upon the manner and timeframe for the approval of the minor changes. One manner entails the holder providing sufficient information to affirm the change is minor. This information includes a list of parts by name and number, their latest FAA-approved drawing revision with date of approval, and a brief description of each change. The applicant and ACO often record the agreement in writing for clarity. Some acceptable methods for approving minor changes in the designs of parts are:

- Periodically send a list of changes and descriptive or substantive data to the ACO,
- Designee (DER) or ODA approve the minor changes,
- Use the change control process in the approved fabrication inspection system,
- Holder of the design approval for the original part approves changes.

(2) Any changes to critical parts and major changes to other PMA parts require prior approval by the appropriate ACO. This approval occurs before implementing any change and in the same manner as original PMA. Also, we expect the PMA holder to show the effects of this change on the next higher assembly and associated product in a revised safety assessment.

(3) If the basis for the PMA was identity by showing evidence of a licensing agreement, the holder may implement the same minor changes accepted by the FAA on an original TC or STC part. In this case, PMA holders have the responsibility to keep a document trail linking their change to the revised design of the original design approval holder. When the licensing agreement ends or does not mention change control authority, the PMA holder submits design changes to the FAA for approval. The ACO having jurisdiction over the PMA holder approves those later changes.

Note: Part manufacturers must get their own TSO authorization if the installation of a replacement part results in a major design change to a TSO article. A new TSO authorization is unnecessary if you install a PMA part under 14 CFR part 43 or other applicable airworthiness regulations. See Order 8150.1 for more details.

f. Relationship Change in a License Agreement. The PMA holder may not produce parts when a change in its relationship to the design approval holder prevents them from meeting their PMA responsibilities.

Chapter 3. Aircraft Certification Office (ACO) Responsibilities

1. General Responsibilities. The geographic ACO as specified in FAA Order 8100.5, *Aircraft Certification Service Mission, Responsibilities, Relationships, and Programs*, has several responsibilities for PMA applications. The project engineers at these offices make findings of compliance with applicable regulations. Also ODA units have nearly the same responsibilities and authorities for approving the design of replacement parts as ACO personnel. Both the ACO and ODA unit follow the same process that show prospective parts meet the airworthiness requirements of their respective products. However, ODA holders must develop their own procedures that follow our design approval process in PMA. The ODA responsibilities, authorities and limitations are in Chapter 13 of Order 8100.15. The project engineer at the ACO has the following administrative and technical responsibilities:

a. Accepts Application. The ACO in the applicant's geographical area accepts the application for a PMA based on identity without a licensing agreement or test and computation. See appendix D for a sample of this FAA-PMA letter of application. If the PMA basis is identity with evidence of a licensing agreement or STC, applicants send a letter directly to the MIDO in the geographic area of their manufacturing facility. Consult ACO or MIDO policy on how to acknowledge receipt of the applicant's letter.

b. Confirms Location of Manufacturer. If the FIS is outside the United States, we at the FAA will not issue or expand a PMA unless regulatory oversight places no undue burden on us. Work with headquarters, Production and Airworthiness Certification Division (AIR-200), to determine if the oversight poses an undue burden. See Order 8100.11, *Developing Undue Burden and No Undue Burden Decision Papers Under 14 CFR Part 21*, for more details.

c. Manages Design Review and Approval. The rigor and scope of the design data depend on the part's complexity and criticality. A PMA project involving complex, critical, or life-limited parts may involve a PSCP. The PSCP is an agreement between the PMA applicant and the FAA on applicable documents, project schedule, certification basis, testing, conformity inspections, communication/coordination, and delegation involved in the project. See appendix B for an example of a PSCP. A PSCP is usually not necessary for simple, non-critical parts when the supporting data are substantially complete with the application for PMA. Use of the PSCP is at the reviewing ACO's discretion.

d. Reviews Engineering and Test Data. Review the applicant's engineering design to determine if the design meets the applicable airworthiness standards. Seek FAA expertise from other ACOs, directorates, and Chief Scientific and Technical Advisors (CSTA) as needed. Dependent on the nature and complexity of the part:

- Verify safety assessment.
- Verify acceptable service history of the original part.
- Verify the eligibility for installation on type-certificated products.

- Verify the PMA application uses airworthiness requirements applicable to the type-certificated product on which the PMA part is installed.
- Verify the design data are adequate to produce the part.
- Review all differences between the proposed and original parts. Assess the technical justification for these differences and associated impacts on the next higher assembly and product. For example, weight and other mass properties can influence vibratory response and performance of rotating components. Also, assess the applicant's analysis of part weights and associated effects from any weight differences on an assembly and associated product.
- Assess requests by applicants for conformity inspections. Engage the MIDO when conformity deemed necessary.
- Review and approve test plans and reports.
- Find the applicant's substantiating data show compliance with applicable airworthiness standards.
- Verify suitability of applicant's COS plan.

2. Applicant Approaches. Applicants may combine comparative and general analyses in their test and computation approaches to show compliance with airworthiness standards. They compare various part attributes and features to that of a part approved under a type certificate. These comparisons show the design of a prospective replacement part is at least equal to that of the original part. Associated tests and computations account for any differences in these designs as well as confirming compliance with airworthiness standards.

3. Review of Applicant's Abilities. Review each application with the MIDO as needed. Coordinate conformity inspections when part criticality, complexity, an applicant's history or other factors warrant. Confirm the applicant's ability to do the following:

- Conform materials to specifications in the design;
- Conform the part to the design drawings;
- Apply the manufacturing, construction, and assembly processes specified in the part's design (see 14 CFR § 21.303(f)(1) through (4));
- Process approval of major and minor design changes; and
- Track and report failures, malfunctions, and defects per the requirements in 14 CFR § 21.3.

4. Coordination with Certificate Management ACO (CMACO). Coordinate with the CMACO and the accountable directorate on all critical parts. Send the CMACO copy of the

certification project notification (CPN) upon notifying the accountable directorate. See Order 8110.4, Appendix 1, Figure 4 for the CPN form. Set the appropriate level of CMACO involvement based on the part's criticality; at a minimum, coordinate service history and safety assessment. If the part basis is identity, confirm with the CMACO (and MIDO when appropriate) if the applicant's manufacturing processes are identical to the part produced under the TC or STC. Also some product directorates require coordination of approvals for parts that may affect critical parts. Consult with your directorate for specific guidance on the coordination method and scope.

5. Verification of Installation Eligibility.

a. A manufacturer's IPC offers information about installation eligibility, but the IPC is usually not FAA-approved. Consider using the IPC with other data like purchase orders from the PAH, service bulletins, maintenance manuals, a technical publications index, or a master drawing list. We cannot use the IPC to make any engineering finding leading to approval of the applicant's design data. Also we cannot use the IPC to determine part conformity. Other acceptable documentation is a combination of the following:

- FAA airworthiness approval tag (FAA Form 8130-3),
- Other PMA supplements, and
- "Weight of evidence" evaluations using enough information from various sources to show eligibility.

b. Accept use of the IPC alone as a means for verifying installation eligibility on non-critical parts. When the IPC is the sole means of verifying installation eligibility, confirm the authenticity of that IPC.

c. If the application lacks documentation from the TC or TSO authorization holder (or other FAA-approved data), then the ACO may consider other evidence from the applicant. To verify installation eligibility, check other documents including the type design's master drawing list.

6. Service History Considerations. Review of the service history is essential when a part is critical. However, verify that any part regardless of criticality is neither subject to an AD nor a causal factor in an accident. Also, verify the part is free of continued airworthiness problems. Follow the guidelines below if a TC or STC part has a potential unsafe condition and the proposed PMA part has a similar design:

a. Reject the PMA application if an existing AD removes the associated TC holder's part from service immediately or in the future.

b. Consider delaying the processing or rejecting the PMA application if we are discussing or developing an AD to remove the TC holder's part from service.

c. If the TC holder's part is under investigation for an incident or accident, delay processing the PMA application until the part is cleared.

d. Reject the PMA application if an AD calls for repetitive inspections without setting a terminating corrective action (for example, modification or replacement of the part). Also, reject the PMA application if the intent of repetitive inspections is to detect potential failures before reaching a published service life. We want and prefer a terminating corrective action. Issuing a PMA to produce and distribute parts of a substantially identical design only complicates and prolongs the unsafe condition.

e. If a part is not identical or substantially identical to the TC holder's part, determine whether installing the applicant's part creates an unsafe condition.

f. If the original part has a service bulletin to remove it from service, we may still issue a PMA. A service bulletin alone is not enough to disapprove a PMA.

g. If the part is having service difficulties and the FAA is **ACTIVELY** pursuing corrective action (that is, a design change per 14 CFR § 21.99) with the TC holder, reject the application for PMA.

h. Consult the FAA Service Difficulty Reporting System and the TC product support database for service difficulties of a critical part.

7. Life-Limited Parts. Substantiate any life-limited parts per applicable paragraphs in chapter 2, paragraph 5 in this order. The required substantiating data must include fatigue tests on components produced by the applicant. Ensure the applicant notes the PMA life limits in the part's ICA.

8. Special Considerations—Identity without A License Agreement. Design approval based on identity entails the applicant showing that the PMA part design is identical to the TC part design in dimensions, tolerances, materials, processes, and specifications. See chapter 2, paragraphs 3a and 3b of this order for more details. Design approval occurs after we make a finding of identity. However, some part designs contain features that have no influence on airworthiness or the next higher assembly. These features may include color, tighter tolerances, and so on. The PMA design may deviate in these features without affecting identity. Also, the applicant's design need not conform to the latest revision level of the TC, STC or TSO authorization holder's drawing if we determine that the previously approved parts are still eligible for installation on the listed product models.

a. Limitations of Reverse Engineering. Take special care in evaluating identity based on reverse engineering. Reverse engineering is one way to develop the part's design. However, reverse engineering a part will not normally produce a design that is identical to a type-certificated part. The applicant is unlikely to show that tolerances, processes, and manufacturing specifications are identical. The rigor and scope of the substantiating data should reflect the degree that the design is identical. The test and computation method is the alternative to identity. The applicant shows that the proposed design complies with the applicable regulations.

b. Identity Not Found. If the design data (including the manufacturing processes) do not show that the part is identical to a part covered under a TC, reject and return the application to the applicant. Notify the applicant of the failure to find identity. See

appendix G, Sample Design Rejection Letter. However, PMA is still possible if the applicant shows through tests and computations that the part meets all applicable airworthiness requirements per 14 CFR § 21.303(f)(1) through (4).

c. Design Changes. Limit design changes on PMA parts based on identity without a license agreement. Limit these changes to part marking, updated specifications, and so on.

9. Special Considerations—Test and Computation. Evaluate all aspects of the part design. Many applicants use a comparative approach (see chapter 2, paragraph 6b(1)). This approach under test and computation compares a PMA part to a TC holder's or licensee's part to show equivalency and associated compliance to regulations. Another approach is general analysis (see chapter 2, paragraph 6b(2)) that shows direct compliance with applicable regulations. Most applicants use a combination of comparative and general analyses. Also consult with other FAA organizations such as directorates, chief scientific and technical advisors, and designees as needed to promote timely reviews.

a. Safety Assessment. Review the applicant's assessment of the part criticality. Confirm the criticality determination as necessary with the CMACO. Use available FAA expertise to aid in evaluating these assessments (see chapter 2, paragraph 5d).

b. Reverse Engineering. Applicants typically use this process to duplicate parts without original design data. The process entails disassembly, measurement of features, and material and functional analyses. Subsequent testing confirms the intended function. Review the applicant's data to confirm equivalency to the original design. Ensure the design of the duplicate part defines dimensions, material properties (for example, microstructure, chemical composition), special processes (for example, welds, heat treat, coatings), and continued airworthiness requirements. Ensure that the applicant has adequately captured potential sources of variability in both the original design and the duplicate part. Potential sources of variability include processing characteristics (lots, billets, etc.), material supply vendor, and other such considerations.

c. Test Plans and Reports. Review any test plans and results that show the part is equivalent to the original or complies with applicable airworthiness standards. Also, verify that the results confirm the functionality of complex parts in their assemblies. Request additional testing as needed to confirm equivalency to the original part and impact on the original's ICA.

d. ICA or Maintenance Instructions. Review the applicant's proposed ICA or maintenance instructions and coordinate with the appropriate aircraft evaluation group (AEG) of the Flight Standards Service. If the applicant proposes that no new ICA or maintenance instructions are necessary, review the applicant's substantiation for that position. If the ACO agrees that the TC or TSO authorization holders' instructions are applicable, note such on the notification letter. See appendix H, Sample Notification Letter.

e. Minor Design Changes.

(1) Title 14 CFR §21.95 stipulates that approval of minor changes may occur in a manner acceptable to the administrator. PMA holders are responsible for properly assessing the magnitude and impact of changes on their designs. We approve these minor changes when we

accept their lists and supporting assessments of minor changes at periodic intervals. This approach places the responsibility for safety of the design change on the PMA holder. We view a design change as major in PMA when it has an appreciable affect on the basis of its approval.

(2) The certifying ACO sets the manner and interval for approving minor changes to the design of a PMA part. One manner is through a written agreement with the PMA holder to periodically provide a list of minor changes to the ACO. The holder provides sufficient information to affirm the change is minor. This information lists the parts by name and number, their latest FAA-approved drawing revision with date of approval, and a brief description of each change. The ACO keeps a record of these approvals and provides documentation of such to the PMA holder. As noted in their handbook, we may authorize designees to approve these changes.

10. Evaluating the Drawing Package. Ensure all applications include enough detailed design data. These data include drawings, technical data that confirms structural strength, part marking information, process specifications that define the configuration, and other data that define the pertinent characteristics of the part. The applicant presents their own detailed drawings unless they submit evidence of a license agreement. Confirm the drawing control procedures are commensurate with the nature and complexity of the part. Consider the following areas when evaluating any data package:

a. Manufacturing and Process Specifications. Manufacturing procedures and process specifications may affect the part's airworthiness. If the applicant's detail drawings refer to a TC holder's process specifications, then the applicant must submit these specifications. Coordinate with the CMACO as necessary to determine how these specifications affect the design's airworthiness.

b. Source Control Drawings. Carefully review source control drawings to determine if the applicant has proper control over the part's configuration and manufacture. Ensure the applicant submitted all applicable detail drawings and specifications. We need these drawings and specifications to evaluate the sources listed on source control drawings. Before sending the application to the MIDO, confirm the applicant has satisfactory and verifiable control procedures in the FIS for vendor-supplied items. Coordinate with the responsible MIDO, using a request for conformity.

c. Drawing Notes. Establish that the applicant's data are enough to produce conforming parts before issuing engineering approval. Evaluate each applicant's ability to produce the part on a case-by-case basis. If the applicant cannot provide this information, use the test and computation method. Pay particular attention when the design approval holder's drawings or specifications used to make a finding of identity have notes stating:

- Parts supplied to this drawing shall be in strict accordance with samples (first articles) approved by (*name of applicant*) engineering department unless prior written approval is given to subsequent change.
- Source approval is required for raw stock through total fabrication.

- This drawing represents a critical item and must successfully complete substantiation tests and be approved by engineering.
- Other similar statements implying special source selection criteria.

11. Conformity Inspections. Conformity inspections are at the discretion of ACO or MIDO. The need for these inspections depends on part complexity, criticality and applicant capabilities. Conformity inspections ensure that a modification or replacement part complies with an approved design and confirms that the associated manufacturing facilities have the capabilities to produce this design. Also the inspections are a prerequisite for FAA certification tests. However, an inspection of the first article by the applicant may demonstrate conformity for simple, non-critical parts. Coordinate with the responsible MIDO to schedule timely inspections. Then the MIDO or appropriate designees determine that the part conforms to its drawings, specifications, and special processes. Use FAA Form 8120-10, *Request for Conformity*, or FAA Form 8110-1, *Type Inspection Authorization*, to request an inspection.

12. Design Approval. Perform the following steps after finding that the applicant showed compliance with the applicable airworthiness requirements:

- a.** Keep the submitted data package for ACO project files or get a written agreement with the applicant for on-demand access except as noted in paragraph c below.
- b.** Send the applicant a letter that confirms you sent the application to the MIDO for more processing. See appendix H for a sample of a notification letter. Adjust this sample to comply with office guidelines on format as needed, but ensure the revised format contains the same information as the sample.
- c.** Return previously FAA-approved design data that the applicant voluntarily submitted. In the official ACO files, list this previously approved data that supported a finding of identity.
- d.** Send copies of the unnumbered and signed PMA supplement and the applicant's letter to the responsible MIDO. If the responsible MIDO is remotely located, send advanced electronic copies of these documents to expedite processing of the PMA.

13. Revising the PMA Supplement. Often an existing supplement needs correcting for typographical errors or updating changed contacts. Each ACO or MIDO usually sets an appropriate method to correct or update the supplement. Some offices issue a revised supplement with corrections. Then, they send the revised supplement to the PMA holder and request return of the original incorrect supplement. Usually we need an amendment to the supplement when an applicant adds eligibility to the supplement. AIR-140 desires the updated supplements in Microsoft Word table format with a note stating the ACO or MIDO action (for example, correction, revision, amendment, superseding, cancellation or change of address).

14. Non-Compliance. If you cannot find compliance, send the applicant a rejection letter and return the applicant's data package in its entirety. Do not divulge any information from other parties used in the course of the design evaluation. See appendix G for a sample of an FAA design rejection letter. Adjust the format of the letter as needed, but keep the information from the sample.

Chapter 4. Manufacturing Inspection District Office (MIDO) Responsibilities

1. PMA Activities. Refer to FAA Order 8120.2, Section 5 for MIDO responsibilities in PMA.

Chapter 5. Designated Engineering Representatives (DER) and Organization Designation Authorization (ODA)

1. DER Roles in the PMA Process. We at the FAA or our organizational designees have authority to approve PMAs. DERs do not approve PMAs, but support the FAA approval process with findings within their limitations. We list DER limitations in Order 8110.37, *Designated Engineering Representative (DER) Handbook*, Appendix 1. The PMA process entails findings of design acceptability through identity or test and computation. Note that the FAA reserves the approvals of certain aspects of critical parts regardless of the PMA basis. A DER may only recommend approval within the scope of their authority for these parts.

2. Test and Computation. Findings under test and computation are within the normal scope of DER delegation. DERs find compliance with the appropriate airworthiness regulations and record these findings and their approval on FAA Form 8110-3. See the following appendixes in this order for examples of DER findings and associated bases:

- Appendix I, Form 8110-3, Test and Computation (General Analysis). Appendix I shows DER approval of data from tests and computations using a general analysis approach.
- Appendix J, Form 8110-3, Test and Computation (Comparative Analysis). Appendix J shows DER approval of data from tests and computations using a comparative analysis approach.

3. Identity Provisions. Identity is unique to PMA. A DER requires a special FAA authorization to make this finding. The DER adheres to the provisions in Order 8110.37 when conducting PMA activities for findings of identity. See appendix K, for an example of a completed FAA Form 8110-3 for Identity.

4. Findings of Identity. Designees verify the following for findings of identity:

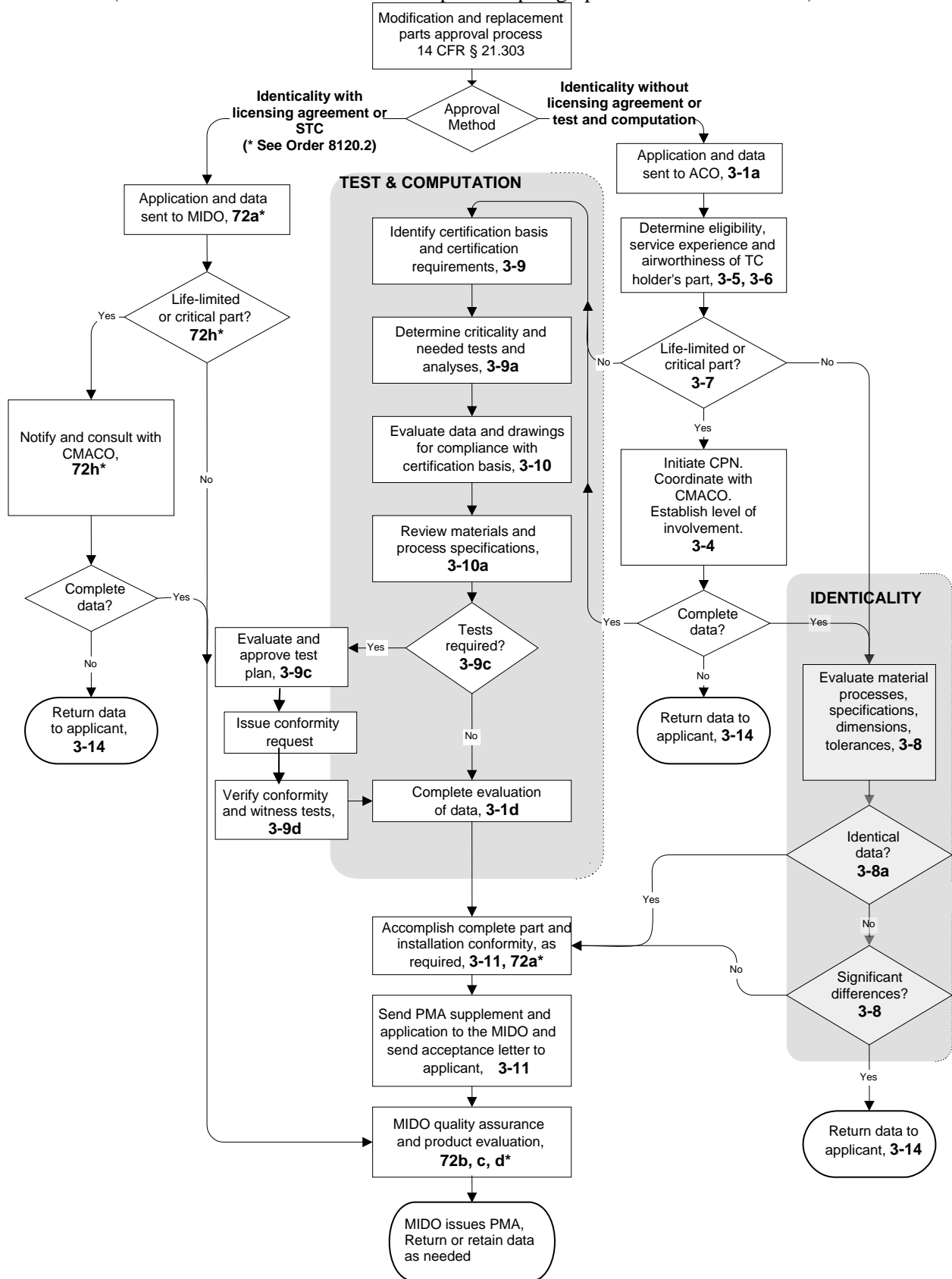
- The TC, STC or TSO authorization data listed on Form 8110-3 is approved type design data for the indicated product models.
- The stated eligibility of the PMA is appropriate.
- No mandatory corrective actions are necessary in the part.
- No serious unresolved service difficulties will make the part ineligible for installation.

5. ODA Role in the PMA Process. We may authorize an ODA unit to perform the following PMA functions per Order 8100.15, Chapter 13:

- a.** Design and production approval authority that allows the ODA unit to approve test and computation decisions and issue PMA supplements to the ODA holder.
- b.** Production approval authority that allows the ODA unit to issue PMA supplements to the ODA holder based on STCs or licensing agreements.
- c.** Airworthiness and conformity authority that allows the ODA unit to issue airworthiness approvals or perform conformity inspections on parts produced by the ODA holder.

Appendix A. PMA Process Flowchart

(Note: Numbers in **bold** refer to chapter and paragraph numbers in this order.)



Appendix B. Project Specific Certification Plan

Note: This document is a template and an aid to help define content and format when drafting a PSCP. All text in italics is instructional for editing or deletion as necessary. Retain all text not in italics in the PSCP, but edit as necessary for each project.

Project Specific Certification Plan

Between

[Insert the Name of the Applicant/Company]

and the

[Insert the FAA Certification Office]

Project Number (leave blank until number assigned)

List of Revisions			
Revision Number	Revision Description	Approved by:	Release Date

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<u>Section</u>	<u>Title/Subject</u>	<u>Page</u>
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	1.1 Scope	
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8.0	Delegations	
9.0	Signatures	

1.0 Introduction

1.1 Scope

The purpose of this Project Specific Certification Plan (PSCP) is to define and document the requirements and tasks required for FAA evaluation and PMA approval of replacement parts. The *[Insert the applicable FAA Certification Office]* of the Federal Aviation Administration and the applicant will jointly manage and maintain this PSCP.

1.2 Project Description

This section should contain a brief description of the aircraft, engine, propeller, or TSO part requested for PMA approval including the part name, part number, and make/model eligibility.

1.3 Background (include service history)

1.4 Component Description

1.5 Instructions for Continued Airworthiness Plan

2.0 Applicable Documents

The following documents are required as part of this PSCP to substantiate the manufacture of the parts and to show compliance to the regulations:

<u>Item</u>	<u>Document/Drawing</u>	<u>Revision</u>	<u>Description</u>
1	12121212	A	ABC Aircraft Top Drawing
2	IPC	IR	Illustrated Parts Catalog or other proof of installation eligibility

3.0 Project Schedule

Milestones as Applicable	Proposed Completion Date
---------------------------------	---------------------------------

- Submittal of PSCP
- First Article Conformity
- Test Plan submittal to FAA
- Test Plan approval
- Testing completed
- Test Report submittal to FAA
- DER approved 8110-3 reports/drawings
- Final data submittal for PMA completion
- Issuance of engineering design approval
- Addition milestones as appropriate

4.0 Certification Basis

The certification basis and compliance with the applicable regulations is required, if the substantiation is accomplished by test and computations through general analysis.

5.0 Tests

The applicant will propose any tests necessary to show compliance with the applicable regulations. These tests support the associated general or comparative analysis.

6.0 Conformity Inspections

Please list any expected conformity inspections necessary for this project.

7.0 Communication and Coordination

The focal points for official communication between the FAA and the applicant are as follows:

FAA Office Branch	Project Manager	<i>[Insert Name and phone number]</i>
<i>[Insert Company Name]</i>	Project Manager	<i>[Insert Name and phone number]</i>

This does not prevent team members from engaging or communicating with any other team member, however team members must inform the project focal point. Both the FAA and the applicant will provide to each other a listing of their project team members.

The project focal points will manage the project by conducting regularly scheduled status briefings.

8.0 Delegation.

Both the FAA and the applicant agree to foster an environment where the designees, the FAA, and the applicant maintain open communications. The FAA supports using designees to the fullest extent possible to help in the successful completion of the project in the identified time frame.

The applicant will propose the use of any suitable designee in specific test plans for FAA concurrence of the test plan, and the designees will complete the task. It is important the applicant keep the designees and the FAA focal point informed of any potential shift in the project schedule.

9.0 Signatures:

The FAA and the applicant agree to the provisions of this PSCP as indicated by the signature of their authorized representatives.

FAA Concurrence:

_____ Date: _____
Project Manager

_____ Date: _____
MIDO
[If applicable]

Applicant Concurrence:

_____ Date: _____
Project Manager

Appendix C. List of FAA Manufacturing Inspection District/Satellite Offices

Go to http://www.faa.gov/aircraft/air_cert/locate_office/mido/ to locate the appropriate certificate management office, MIDO, or manufacturing inspection satellite office (MISO) or consult the following:

1. Manufacturing Inspection District Office (NE-MIDO-41)
Bradley International Airport
Corporate Air Building 85-214, 2nd Floor
Windsor Locks, Connecticut 06096
2. Manufacturing Inspection District Office (NE-MIDO-42)
12 New England Executive Park
Burlington, Massachusetts 01803
3. Manufacturing Inspection District Office (NE-MIDO-44)
400 Airport Drive
Building 201, Room 102
New Cumberland, Pennsylvania 17070-3419
4. Manufacturing Inspection District Office (NE-MIDO-45)
Park 80 West – Plaza One
Concourse Level
Saddle Brook, New Jersey 07663
5. Manufacturing Inspection District Office (NE-MIDO-46)
7150 Republic Airport, Suite 236
Farmingdale, New York 11735-1585
6. Atlanta Manufacturing Inspection District Office (CE-42)
One Crown Center, Suite 225
1895 Phoenix Boulevard
Atlanta, Georgia 30349
7. Savannah Manufacturing Inspection Satellite Office (CE-52)
404 Airways Avenue
Savannah, Georgia 31408
8. Mobile Manufacturing Inspection Satellite Office (CE-51)
88 5th Street
Mobile, Alabama 36615
9. Orlando Manufacturing Inspection District Office (CE-44)
Citadel International III Building
5950 Hazeltine National Drive, Suite 405
Orlando, Florida 32822

10. Minneapolis Manufacturing Inspection District Office (CE-46)
Minneapolis/St. Paul International Airport
6020 28th Avenue South, Room 103
Minneapolis, Minnesota 55450-2700
11. Cleveland Manufacturing Inspection District Office (CE-47)
Great Northern Technology Park II
25221 Country Club Blvd., Suite 255
North Olmsted, Ohio 44070
12. Detroit Manufacturing Inspection Satellite Office (CE-53)
Willow Run Airport - East Side
8800 Beck Road
Bellevue, Michigan 48111
13. Vandalia Manufacturing Inspection District Office (CE-48)
3800 Wright Drive
Vandalia, Ohio 45377
14. Chicago Manufacturing Inspection Satellite Office (CE-55)
2300 East Devon Avenue, Room 105
Des Plaines, Illinois 60018
15. Wichita Manufacturing Inspection District Office (CE-43)
Mid-Continent Airport
1801 Airport Road, Room 101
Wichita, Kansas 67209
16. Kansas City Manufacturing Inspection District Office (CE-45)
901 Locust, Room 376
Kansas City, Missouri 64106
17. Seattle Manufacturing Inspection District Office (ANM-108S)
2500 East Valley Road, Suite C-2
Renton, Washington 98057-4099
18. Los Angeles Manufacturing Inspect. District Office (ANM-108L)
3960 Paramount Boulevard
Lakewood, California 90712-4137
19. Long Beach Certificate Management Office
Boeing Long Beach Division, Mail Stop MC36-35
3855 Lakewood Boulevard
Long Beach, California 90806-2425
20. Van Nuys Manufacturing Inspection District Office (ANM-108V)
7120 Hayvenhurst Avenue, Suite 100
Van Nuys, California 91406

21. Phoenix Manufacturing Inspection District Office (ANM-108P)
13951 North Scottsdale Road, Suite 123
Scottsdale, Arizona 85254-3454
22. Fort Worth Manufacturing Inspection District Office (SW-MIDO-42)
2601 Meacham Boulevard
Fort Worth, Texas 76137-4298
23. Oklahoma City Manufacturing Inspection District Office (SW-MIDO-41)
5909 Philip J. Rhoads Avenue
Suite 206
Bethany, Oklahoma 73008
24. San Antonio Manufacturing Inspection District Office (SW-MIDO-43)
10100 Reunion Place, Suite 650
San Antonio, Texas 78216

Appendix D. Sample FAA-PMA Letters of Application To ACO

The ABC Tool Company
3000 Hill St.
Randolph, MA 02368
(781) 555-1212

FAA - New England Region
12 New England Executive Park
Burlington, MA 01803
(781) 238-7199

Attention: Mr. Mark Jones
Manager, Engine Certification Office, ANE-140

Subject: Request for New FAA-PMA Approval

Mr. Jones:

We are applying for parts manufacturer approval for our part number (P/N) ABC 13579. We request your review of the enclosed data in support of this application. ABC 13579 is a bushing assembly eligible for installation on PS PT9D-1, -7, -9 series engines. We base this requested approval on **(showing identity without license agreement or submitting test reports and computations)** per 14 CFR § 21.303(c). ABC 13579 replaces PS bushing assembly P/N ABC 13579, drawing no. 13579, revision level C.

We will manufacture this bushing assembly in our facility at 3000 Hill Street, Randolph, MA 02368. We certify that the establishment of a fabrication inspection system per 14 CFR § 21.303(h) for manufacture of this part.

We appreciate your efforts in support of this request.

Very truly yours,

PMA Administrator,
ABC Tool Company

Enclosures:
1 copy ABC drawings, specifications, and processes
1 copy unnumbered PMA supplement

Appendix E. List of FAA Aircraft Certification/Field Offices

Go to http://www.faa.gov/aircraft/air_cert/locate_office/aco/ to find the appropriate ACO or refer to the following:

1. Engine Certification Office (ANE-140)
12 New England Executive Park
Burlington, Massachusetts 01803-12
2. Boston Aircraft Certification Office (ANE-150)
12 New England Executive Park
Burlington, Massachusetts 01803
3. New York Aircraft Certification Office (ANE-170)
1600 Stewart Avenue, Suite 410
Westbury, New York 11590
4. Anchorage Aircraft Certification Office (ACE-115N)
222 West 7th Avenue, #14
Room 128
Anchorage, Alaska 99513-7587
5. Atlanta Aircraft Certification Office (ACE-115A)
One Crown Center
1895 Phoenix Boulevard, Suite 450
Atlanta, Georgia 30349
6. Chicago Aircraft Certification Office (ACE-115C)
2300 East Devon Avenue, Room 107
Des Plaines, Illinois 60018
7. Wichita Aircraft Certification Office (ACE-115W)
Mid-Continent Airport
1801 Airport Road, Room 100
Wichita, Kansas 67209
8. Seattle Aircraft Certification Office (ANM-100S)
1601 Lind Avenue, S.W.
Renton, Washington 98055-4056
9. Denver Aircraft Certification Office (ANM-100D)
Technical Operations Center
26805 East 68th Avenue, Room 214
Denver, Colorado 80249
10. Los Angeles Aircraft Certification Office (ANM-100L)
3960 Paramount Boulevard
Lakewood, California 90712-4137

11. Airplane Certification Office (ASW-150)
2601 Meacham Boulevard
Fort Worth, Texas 76193

12. Rotorcraft Certification Office (ASW-170)
2601 Meacham Boulevard
Fort Worth, Texas 76193

13. Special Certification Office (ASW-190)
2601 Meacham Boulevard
Fort Worth, Texas 76193

**Appendix F. Sample FAA-PMA Supplement for Identity
(Non-Licensing Agreement) or Test and Computation**

Use this MS Word table format where each part name and number occupy a separate row. Do not add extra fields, rows, or columns to separate data. Remove any hard returns or line breaks from within the table cells. Use spaces and wraparound with the cells to align text.

FEDERAL AVIATION ADMINISTRATION - PARTS MANUFACTURER APPROVAL

Smith Engineering Corporation
10 Main Street
Los Angeles, CA 90012

PMA NO. _____
SUPPLEMENT NO. _____
DATE _____

Part Name	Part Number	Approved Replacement for Part Number	Approval Basis and Approved Design Data	Make Eligibility	Model Eligibility
Spring	SE24689	24689	Identity per 14 CFR § 21.303 <u>DWG No:</u> SE 25206, <u>Rev:</u> None <u>Date:</u> 3/31/88 or later FAA-approved revisions	PW Canada	PT6T-3, 3A, -3B, 3BE, -3D, -3DE, 3DF, -6
Pin	SE24695	24695	Test and Computations per 14 CFR § 21.303, <u>DWG No:</u> SE 25207, <u>Rev:</u> None <u>Date:</u> 3/31/88 or later FAA-approved revisions	Aerospace Technologies	N22B, N24A
				Augusta	A109AII
				Bell	47, 47B, 47B3, 47D, (USAF H-13B), 47D1 (USAF H-13D, H-13E

NOTE:

- 1) Provide minor design changes in a manner as determined by the ACO. Handle major design changes to drawings and specifications in the same manner as that for an original FAA-PMA.
- 2) The FAA approved ICA for the above parts with their designs. These ICA may refer to those of the respective parts from the holders of type certificates. Otherwise, provide supplemental ICA for differences in the replacement parts. Make referral statements or supplemental ICA readily available per 14 CFR 21.50.

Manager, Aircraft
Certification Office

Manager, Manufacturing
Inspection District Office

Appendix G. Sample Design Rejection Letter



U.S. Department
of Transportation
**Federal Aviation
Administration**

Rotorcraft Certification Office
2601 Meacham Blvd.
Fort Worth, TX 76137-4298

[Date]

Expert Aviation Co.
1000 West Street
Tempe, AZ 85281

To Whom It May Concern:

This is in response to your request for design approval based on identity. We reviewed your data and did not find it identical to the corresponding approved data. Enclosed are the data you sent to us.

Sincerely,

Manager, Rotorcraft Certification Office

Enclosure

Appendix H. Sample Notification Letter of PMA Status



U.S. Department
of Transportation
**Federal Aviation
Administration**

Engine Certification Office
12 New England Executive Park
Burlington, MA 01803

[Date]

XYZ Aviation Co.
1000 West Street
Burlington, MA 01803

To Whom It May Concern:

This is in response to your letter, dated April 5, 1995, requesting parts manufacturer approval (PMA) on XYZ Aviation bushing assembly Part Number XYZ13579 that is eligible on the ABC JT9D-3A series engine.

We reviewed the drawings and data submitted and find they meet the requirements of 14 CFR § 21.303(d)(1). Also we concur with your instructions for continued airworthiness (ICA) for this part. We sent your application to (*name and address of MIDO*). We will grant production approval after validating your fabrication inspection system. The FAA-PMA letter and attached PMA supplement from the MIDO will document and set the scope your approval, respectively.

Sincerely,

Manager, Engine Certification Office

cc: Van Nuys MIDO

Appendix I. Form 8110-3, Test And Computation (General Analysis)

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION STATEMENT OF COMPLIANCE WITH THE FEDERAL AVIATION REGULATIONS		DATE October 20, 2001	
AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION			
MAKE General Electric	MODEL NO. CF6-50, CF6-80, CF6-80C2	TYPE (<i>Airplane, Radio, Helicopter, etc.</i>) Engine	NAME OF APPLICANT Sam's Engine Parts
LIST OF DATA			
IDENTIFICATION		TITLE	
A12345X Rev. D 04/01/2001		Oil Pump Shaft Drawing	
RPT-2468 Rev. B 04/12/2001		Certification and Compliance Report	
- - -END- - -			
PURPOSE OF DATA In Support of PMA Design Approval for the listed part; Test & Computation by General Analysis			
APPLICABLE REQUIREMENTS (<i>List specific sections</i>) 14 CFR § 33.xx and/or compliance checklist			
CERTIFICATION – Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under Part 183 of the Federal Aviation Regulations, data listed above and on attached sheets numbered <u>N/A</u> have been examined in accordance with established procedures and found to comply with applicable requirements of the Federal Aviation Regulations. I (We) Therefore <input type="checkbox"/> Recommend approval of these data <input checked="" type="checkbox"/> Approve these data			
SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)		DESIGNATION NUMBER(S)	CLASSIFICATION(S)
<i>Joe Smith</i>		DERT-999999-NM	<i>Engine/Part 33</i>
Joe Smith			

Appendix J. Form 8110-3, Test And Computation (Comparative Analysis)

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION STATEMENT OF COMPLIANCE WITH THE FEDERAL AVIATION REGULATIONS		DATE October 20, 2002	
AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION			
MAKE MCDONNELL DOUGLAS	MODEL NO. DC-9-83, -87 and MD-88	TYPE (<i>Airplane, Radio, Helicopter, etc.</i>) AIRPLANE	NAME OF APPLICANT SAM'S AIRPLANE PARTS
LIST OF DATA			
IDENTIFICATION		TITLE	
A12346X Rev. A 04/01/2002		Tray Table Drawing	
RPT-2469 Rev. A 04/12/2002		Certification and Compliance Report	
- - -END- - -			
PURPOSE OF DATA In Support of PMA Design Approval for the listed part; Test & Computation by Comparative Analysis			
APPLICABLE REQUIREMENTS (<i>List specific sections</i>) Comparative tests and applicable 14 CFR part 25 requirements.			
CERTIFICATION – Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under Part 183 of the Federal Aviation Regulations, data listed above and on attached sheets numbered _____ have been examined in accordance with established procedures and found to comply with applicable requirements of the Federal Aviation Regulations. I (We) Therefore <input type="checkbox"/> Recommend approval of these data <input checked="" type="checkbox"/> Approve these data			
SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)		DESIGNATION NUMBER(S)	CLASSIFICATION(S)
<i>Joe Smith</i>		DETR-999999-NM	<i>Systems & Equipment</i>
Joe Smith			

Appendix K. Example Of FAA Form 8110-3 For Identicality

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION STATEMENT OF COMPLIANCE WITH THE FEDERAL AVIATION REGULATIONS		DATE October 20, 2001	
AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION			
MAKE General Electric	MODEL NO. CF6-50, CF6-80, CF6-80C2	TYPE (<i>Airplane, Radio, Helicopter, etc.</i>) Engine	NAME OF APPLICANT Sam's Engine Parts
LIST OF DATA			
IDENTIFICATION		TITLE	
A12345X Rev. D 04/01/2001		Oil Pump Shaft Drawing	
RPT-2468 Rev. B 04/12/2001 - - -END- - -		Certification and Compliance Report	
		FAA approval of the design is contingent upon FAA Engineering verification of the type design data listed.	
PURPOSE OF DATA Identicality only under 14 CFR § 21.303			
APPLICABLE REQUIREMENTS (<i>List specific sections</i>) 14 CFR § 21.303(c)(4)			
CERTIFICATION – Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under Part 183 of the Federal Aviation Regulations, data listed above and on attached sheets numbered <u> N/A </u> have been examined in accordance with established procedures and found to comply with applicable requirements of the Federal Aviation Regulations. I (We) Therefore <input type="checkbox"/> Recommend approval of these data <input checked="" type="checkbox"/> Approve these data			
SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)		DESIGNATION NUMBER(S)	CLASSIFICATION(S)
<i>Joe Smith</i>		DERT-999999-NM	<i>PMA Identicality Findings</i>
Joe Smith			

Appendix L. List of Acronyms

14 CFR	Title 14 of the Code of Federal Regulations
AC	Advisory Circular
ACO	Aircraft Certification Office
AD	Airworthiness Directive
AEG	Aircraft Evaluation Group
AIR-100	Aircraft engineering Division
AIR-200	Production and Airworthiness Certification division
ANSI	American National Standards Institute
CAA	Civil Aviation Authority
CPN	Certification Project Notification
CMACO	Certificate Management ACO
COS	Continued Operational Safety
CSTA	Chief Scientific and Technical Advisor
DER	Designated Engineering Representative
DMIR	Designated Manufacturing Inspection Representative
FAA	Federal Aviation Administration
FIS	Fabrication Inspection System
ICA	Instructions for Continued Airworthiness
IPC	Illustrated Parts Catalog
LODA	Letter of Design Approval
MIDO	Manufacturing Inspection District Office
MISO	Manufacturing Inspection Satellite Office
ODA	Organization Designation Authorizations
PAH	Production Approval Holder
PSCP	Project Specific Certification Plan
PMA	Parts Manufacturer Approval
P/N	Part Number
STC	Supplemental Type Certificate
TC	Type Certificate

6/23/08

**8110.42C
Appendix L**

TCDS Type Certificate Data Sheet

TSO Technical Standard Order

Appendix M. Definitions and Terms

When following procedures in this order, the following definitions and terms apply:

- 1. Aircraft Certification Office (ACO)** is the field branch of the FAA Aircraft Certification Service. The **project ACO** has geographic responsibility for finding the design complies with applicable airworthiness standards. It administers and secures compliance with agency regulations, programs, standards, and procedures governing the design approval of replacement and modification parts. The individual ACO's location, addresses, and geographic areas of responsibility are in appendix C, List of FAA Aircraft Certification/Field Offices.
- 2. Certificate Management ACO (CMACO)** is the ACO that issues and has oversight over the original design approval for the product/appliance for which the PMA applicant's part is eligible for installation.
- 3. Critical parts** are those whose failure results in a direct hazardous effect. A hazardous effect prevents continued safe flight and landing. Each product has these parts. Their designs have key attributes that require controls to protect their integrity. Life-limited parts are also critical when their failure especially from exceeding their operational limits or fixed replacement intervals cause direct hazardous effects. However, not all critical parts are life-limited nor are all life-limited parts critical.
- 4. Continued Operational Safety (COS)** assures the integrity of a product throughout its service life. This involves problem prevention, service monitoring and corrective actions that feedback into a product's design and production.
- 5. Design** is all drawings and specifications that show the part's configuration and all information on dimensions, tolerances, materials, processes, and procedures necessary to define all part characteristics. A master drawing list is the summary of these drawing and specifications. The design can also include the airworthiness limitations section of the instructions for continued airworthiness.
- 6. Distributor** is a supplier who buys and sells aviation products, parts, appliances, components, or materials. Distributors do not manufacture these items.
- 7. Eligibility** relates to the type-certificated products that are approved for installation of a PMA part.
- 8. FAA-PMA Letter** is the initial production approval document issued to the PMA applicant by the appropriate manufacturing inspection district office (MIDO). This letter accompanies a PMA supplement. The supplement is the ACO's record of design approval and the MIDO's production authorization. A transmittal letter that references the initial PMA letter conveys later PMA supplement approvals.
- 9. Instructions for Continued Airworthiness** documents directions and requirements to maintain the continued airworthiness of an aircraft, engine, or propeller.

10. Life-limited Part is a part with an established replacement time, inspection interval, or related procedure in the airworthiness limitations section as required by 14 CFR §§ 21.50, 23.1529, 25.1529, 27.1529, 29.1529, 31.82, 33.4, and 35.4. Early type certificate data sheet (TCDS) has the mandatory replacements or inspections for some products. These products were certified before 14 CFR had the above airworthiness requirements. Also, a letter for a technical standard order (TSO) authorization may note or reference mandatory replacement or inspection for an affected part.

11. Manufacturing Facility is the location of the fabrication inspection system.

12. Manufacturing Inspection District Office (MIDO) is the field branch of the FAA Aircraft Certification Service responsible for certificate management in the geographic area in which the PMA applicant's FIS is located. In some areas, a **manufacturing inspection satellite office (MISO)** will perform these functions. The location, addresses, and geographic areas of responsibility of the individual MIDO/MISO are in appendix C, List of FAA Manufacturing Inspection District/Satellite Offices. The **certificating MIDO** is the MIDO that issued the initial production approval or has certificate management responsibility for producing the product/appliance on which the PMA applicant's part is eligible for installation.

13. Producer of a part is a person who participates in controlling the part's design, manufacture, or quality. Significant participation in one or more of the following actions distinguishes an individual as a producer of a part:

- Fabricating or treating the part, or performing a value-added part inspection.
- Developing the design or performance data to manufacture the part.
- Selecting materials to manufacture the part.
- Developing fabrication processes or assembly methods to manufacture the part.
- Developing quality control procedures to manufacture the part.
- Controlling or supervising the manufacture of the part.

14. Product is an aircraft, aircraft engine, or propeller. See 14 CFR § 21.1(b).

15. Production Approval Holder (PAH) is the holder of a production certificate, approved production inspection system, PMA, or TSO authorization. This person controls the design and quality of a product or part.

16. Quality System is an organizational structure with responsibilities, procedures, processes, and resources that implements a management function to determine and enforce quality principles. A quality system encompasses quality assurance and quality control.

17. Revision is a correction of typographical errors or an update of administrative data on existing PMA supplements.

18. Standard Parts conform to established industry-wide or government specifications. These specifications stipulate the design, manufacturing and uniform identification requirements. The specifications are readily available to any persons or organizations who want to manufacture these parts. Also standard parts may include those that solely meet uniform performance criteria

if the Administrator finds complete compliance with industry-wide and government performance specifications. These specifications must include performance, test and acceptance criteria, and uniform identification requirements. The Administrator deemed discreet electrical and electronic components that conform to their applicable performance criteria as standard parts. See Volume 62 *Federal Register* 9923, March 5, 1997.

19. Supplier is any person or organization contracted to provide aviation products, parts, appliances, materials, or services to a production approval holder.

20. Technical Standard Order (TSO) Authorization is an FAA design and production authorization issued to a specific manufacturer of an article that we found to meet or exceed a specific TSO's minimum performance standard. The Aircraft Engineering Division (AIR-100) is responsible for TSOs. The geographic ACO is responsible for issuing the TSO authorization to the applicant. The TSO authorization is not an installation approval. We approve the installation of the article as part of the type design of a type-certificated product.

Appendix N. Related Publications and How To Get Them

1. Code of Federal Regulations (CFR). You can get copies of 14 CFR sections from the Superintendent of Documents, Government Printing Office, P.O. Box 37154, Pittsburgh, PA 15250-7954. Telephone (202) 512-1800; fax (202) 512-2250. You can also get copies on-line at www.gpoaccess.gov/cfr/.

2. FAA Orders. You can get copies of the following orders from the FAA's Regulatory and Guidance Library (RGL) at www.airweb.faa.gov/rgl/:

- Order 8100.5, Aircraft Certification Service Mission, Responsibilities, Relationships, and Programs,
- Order 8100.7, Aircraft Certification Systems Evaluation Program,
- Order 8100.8, Designee Handbook,
- Order 8100.11, Developing Undue Burden and No Undue Burden Decision Papers Under 14 CFR Part 21,
- Order 8100.15, Organization Designation Authorization Procedures,
- Order 8110.4, Type Certification,
- Order 8110.37, Designated Engineering Representative (DER) Guidance Handbook,
- Order 8120.2, Production Approval and Certificate Management Procedures, and
- Order 8150.1, Technical Standard Order Program.

3. U.S. Military Documents. Order copies of MIL-STD-1916, DOD Preferred Methods for Acceptance of Product, dated April 1, 1996, from the Department of Defense Single Stock Point, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5098. Telephone (215) 697-2179, fax (215) 697-1462. You can also order copies online at <http://dodssp.daps.dla.mil/>.

4. American National Standards Institute (ANSI) and American Society for Quality (ASQ). Order copies of ANSI/ASQC Z1.9-2003, Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming, dated December 18, 2003, from the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203. Telephone (414) 272-8575, fax (414) 272-1734. You can also order copies online at www.asq.org.

Appendix O. Administrative Information

1. Distribution. Distribute this order to the branch level in Washington headquarters, branch levels of the Aircraft Certification Service; the branch levels of the regional aircraft certification directorates; the Brussels Aircraft Certification Staff; all aircraft certification offices (ACO); all manufacturing inspection district offices (MIDO); and all manufacturing inspection satellite offices (MISO).

2. Authority to Change This Order. The issuance, revision, or cancellation of the material in this order is the responsibility of the AIR Certifications Procedures Branch (AIR-110.). This branch will accomplish all changes, as required, to carry out the FAA's responsibility to provide for managing revoked, suspended, surrendered, and abandoned type certificates and supplemental type certificates.

3. Suggestions for Improvement. If you find deficiencies, need clarification or want to suggest improvements to this order, send FAA Form 1320-19, Directive Feedback Information, (written or electronically) to the Aircraft Certification Service, Planning and Financial Resources Management Branch, AIR-530, Attention: Directives Management Officer. You can also send a copy to the Aircraft Engineering Division, AIR-100, Attention: Comments to Order 8110.42. If you urgently need an interpretation, contact AIR-110 at 202-267-9588. Always use Form 1320-19, in appendix P, to follow up each verbal conversation.

4. Records Management. Refer to Orders 0000.1, FAA Standard Subject Classification System; 1350.14, Records Management; and 1350.15, Records, Organization, Transfer, and Destruction Standards; or your office Records Management Officer or Directives Management Officer for guidance regarding retention or disposition of records.

Appendix P. FAA Form 1320-19 Directives Feedback Information

Directive Feedback Information

Please submit any written comments or recommendations for improving this directive, or suggest new items or subjects to be added to it. Also, if you find an error, please tell us about it.

Subject: Order 8110.42C

To: Directive Management Officer, AIR-530

(Please check all appropriate line items)

An error (procedural or typographical) has been noted in paragraph _____ on page _____.

Recommend paragraph _____ on page _____ be changed as follows:
(attach separate sheet if necessary)

In a future change to this directive, please include coverage on the following subject:
(briefly describe what you want added)

Other comments:

I would like to discuss the above. Please contact me.

Submitted by: _____ Date: _____

FTS Telephone Number: _____ Routing Symbol: _____

FAA Form 1320-19 (8-89)(Representation)