



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

# Memorandum

Subject: **INFORMATION**: Policy for Design Approval  
Procedures for Parts Manufacturer Approval of Critical  
Engine and Propeller Parts.

Date: Draft

From: Manager, Engine and Propeller Directorate,  
Aircraft Certification Service

Reply to: Karen Grant, ANE-110  
Attn. of: (781) 238-7119 or

Policy No. karen.m.grant@faa.gov

To: Manager, Aircraft Manufacturing Division, AIR-200  
Manager, Certification Procedures Branch, AIR-110  
Manager, Brussels Aircraft Certification Staff, AEU-100  
Manager, Engine Certification Office, ANE-140  
Manager, Engine Certification Branch, ANE-141  
Manager, Engine Certification Branch, ANE-142  
Manager, Airframe and Propulsion Branch, ANE-171  
Manager, Rotorcraft Directorate, ASW-100  
Manager, Rotorcraft Standards Staff, ASW-110  
Manager, Special Certification Office, ASW-190  
Manager, Small Airplane Directorate, ACE-100  
Manager, Small Airplane Standards Office, ACE-110  
Manager, Atlanta Aircraft Certification Office, ACE-115A  
Manager, Airframe and Propulsion Branch, ACE-117A  
Manager, Chicago Aircraft Certification Office, ACE-115C  
Manager, Propulsion Branch, ACE-118C  
Manager, Systems and Propulsion Branch, ACE-116W  
Manager, Transport Airplane Directorate, ANM-100  
Manager, Transport Standards Staff, ANM-110  
Manager, Airframe and Propulsion Branch, ANM-112  
Manager, Propulsion Branch, ANM-140S  
Manager, Propulsion Branch, ANM-140L

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## **1. PURPOSE.**

a. This proposed policy memorandum provides guidance to Aircraft Certification Offices (ACOs) when establishing their process for evaluating Parts Manufacturer Approval (PMA) applications for critical engine and propeller parts. This proposed policy also requires applicants to complete a failure assessment and to consider the development of a Continuous Operational Safety (COS) plan for all engine and propeller PMA proposed parts.

b. This policy does not supersede previous ANE-110, Engine & Propeller Directorate (E&PD) policy regarding PMA parts. We are, however, updating FAA Orders 8110.4 and 8110.42. After they are updated, we will review all PMA policy including, this policy statement, and cancel or revise as necessary.

c. This policy memorandum applies to critical engine and propeller parts governed by Parts 33 and 35, respectively.

## **2. RELATED DOCUMENTS.**

a. Policy for Parts Manufacturer Approval (PMA) of Reciprocating Engine Critical, Highly Stressed or Complex Parts or Components, issued April 10, 1997.

b. Policy for the Design Approval of Parts Manufacturer Approval (PMA) of Critical and Life-Limited Aircraft Turbine Engine Parts, issued July 16, 1998.

c. ACO Guide, How ACOs Will Work With Other ACOs, issued July 28, 1998.

d. Order 8110.42A, Parts Manufacturer Approval Procedures, issued March 31, 1999.

e. Order 8110.4B, Type Certification, issued April 24, 2000.

f. Parts Manufacturer Approval (PMA) for Critical Propeller Parts – Policy No. ANE-2001-35.1-R0, issued December 17, 2001.

g. Policy for Propeller Safety Analysis – Policy No. ANE-2002-35.15-R0, issued October 30, 2003.

## **3. BACKGROUND.**

a. Over the past several years, the E&PD Standards Staff has been involved in evaluating PMA applications for critical and life-limited engine and propeller parts. We have seen that PMA applicants are pursuing approvals for more complex parts with higher safety criticality. We have concluded that the existing guidance is insufficient.

b. Recently, we worked on a number of service difficulty subjects, which involved both original equipment manufacturer and PMA parts. We observed misconceptions within the PMA industry as to what a PMA holder's obligations should be for the continued airworthiness of their

products. Our review of PMA guidance shows that insufficient information is available to adequately address the observed misconceptions.

c. We also noted confusion about the processing of applicants' PMA applications for critical engine and propeller parts. Order 8110.42 requires the Project ACO (PACO) to coordinate with the Certificate Management ACO (CMACO) on critical PMA projects, to the extent that the CMACO is required to verify completeness of the applicant's design data. The CMACO has first-hand knowledge about the part and the product design critical features, which supports this necessary review for critical parts. However, the effort creates redundancy by having two ACOs doing the same work. It also leads to confusion about who has the ultimate authority and responsibility for PMA design approval. Further, this process has not always been followed for all engine and propeller PMA projects involving critical parts.

d. Although revision efforts are ongoing, interim guidance to cover these shortfalls is needed.

**4. POLICY STATEMENT.** The following methods provide an acceptable means for compliance with the situations specified:

a. Failure Assessment.

(1) Order 8110.4 requires the PACO to coordinate with the CMACO on parts identified as critical. However, that list is not comprehensive and the use of Order 8110.42 is still required to determine the criticality for all other parts.

(2) To help decide what parts are critical, applicants must complete a failure assessment of all engine and propeller PMA proposed parts. The applicant should ensure that their assessment includes, at a minimum, the effects of characteristics, processes, maintenance procedures and inspections when these are failed, omitted or are non-conforming; on the part, its next higher assembly, the part life if applicable, and the product on which the part is installed.

(3) The outcome of the failure assessment must be evaluated against the pass-fail criteria of § 33.75 (a) through (d) for turbine engine parts and policy memorandum No. ANE-2002-35.15-R0 (reference 2.g. above) for propeller parts, to determine if the part is critical. These assessments do not override the identification as critical of those parts listed in FAA Order 8110.4 or in policy memorandum No. ANE-2001-35.1-R0 (references 2.e. and 2.f. above).

b. Processing of Critical PMA Projects. We have determined that PMA applications for life-limited parts will be processed by the appropriate CMACO. All non-life-limited critical PMA applications for engine and propeller parts will be evaluated on a case-by-case basis for transfer of the project to the CMACO after a certification process notification has been issued. Transference of the project will be determined by consensus between the CMACO, the PACO and the appropriate E&PD Standards Staff. The decision will be based on the failure effects of the part and the complexity of the part design and manufacturing.

c. Continued Operational Safety.

(1) Applicants should consider how they intend to comply with 14 CFR §§ 21.3, 21.50, and 21.99 requirements. The continued airworthiness of an applicant's PMA part remains the responsibility of a PMA holder, as noted in previous PMA policy statements, memorandums, and Order 8110.42. However, these materials do not discuss the need to develop, or provide information to develop, an acceptable COS plan for all critical engine and propeller parts. COS is accomplished through the applicant's ability to assess design, manufacturing, and maintenance issues, develop a suitable in-service management plan, and provide the necessary resources to maintain continued operational safety of the product in-service.

(2) In view of the above, applicants should develop a detailed COS plan for all critical PMA parts. The plan should, at a minimum, require the continuous evaluation of in-service part usage and assessment of that experience, against the applicant's design assumptions. Applicants should also demonstrate the ability to evaluate failure modes and effects, and if a failure condition is identified, have appropriate resources and procedures to identify the cause, develop corrective actions, and implement those actions in a timely manner. Applicants should also validate that these corrective actions when implemented give the intended results.

(3) An applicant's ability to develop and support an adequate COS plan and solution when needed depends on the applicant's level of knowledge of their proposed PMA part. For critical engine and propeller parts, this knowledge should include, but is not limited to, all aspects of the function, the manufacturing and the integration of the part, to its next higher assembly, the product on which the part is to be installed, and the use of the product in its operating environment. For critical parts the applicant's capability to develop and obtain FAA approval of a life methodology when applicable, and FAA acceptance of the applicant's risk assessment methodology, are prerequisites to supporting a successful COS plan.

(4) Applicants should provide these COS related requirements during the design approval phase of the PMA process and ACO engineers should determine whether a PMA holder is able to comply before issuing the design approval.

**4. EFFECT OF POLICY.** The general policy stated in this document does not constitute a new regulation or create a "binding norm." Whenever an applicant's proposed method of compliance differs from this policy, the proposal must be coordinated with the Engine & Propeller Directorate Standards Office, ANE-110. In addition, if an office believes that an applicant's proposal that meets this policy should not be approved, that office must coordinate its response with the Engine & Propeller Directorate Standards Office, ANE-110.

**5. CONCLUSION AND RECOMMENDATIONS.**

a. The Engine and Propeller Directorate recommends the implementation of this policy upon receipt. Any applicant proposals outside the scope of this policy should be coordinated with the Engine and Propeller Standards Staff.

b. In summary, we propose that:

(1) The PACO should contact the CMACO if in doubt about an engine or propeller part's criticality after reviewing the applicant's criticality determination.

(2) All PMA applications of life-limited engine and propeller parts that are presented to the PACO will be transferred to the applicable CMACO for processing and design approval.

(3) All other critical PMA applications of engine and propeller parts will be evaluated on a case-by-case basis for transfer to the CMACO.

(4) Applicants must complete a failure assessment of all engine and propeller PMA proposed parts.

(5) PMA applicants should consider how they intend to comply with 14 CFR §§ 21.3, 21.50, and 21.99 requirements during the design approval process.

(6) ACO engineers should determine whether a PMA applicant is able to comply with the COS related requirements before issuing the design approval.

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