



## Federal Aviation Administration

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# Memorandum

Date: July 27, 2006

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

To: SEE DISTRIBUTION

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Subject: **ACTION:** Policy for Repair and Alteration of Rotating Turbine Engine-Life-Limited Parts, § 33.3 [Policy Number ANE-2006-33.3-4]

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### 1. PURPOSE.

a. This policy memorandum provides guidance for determining the effect proposed repairs or alterations may have on rotating turbine engine-life-limited parts (RTE-LLPs). It also reaffirms guidance identified in Orders 8110.37 and 8110.4 for coordinating the review of data for these proposed repairs and alterations.

b. This policy memorandum applies to Aircraft Certification Offices (ACOs) and Designated Engineering Representatives (DERs) when evaluating and approving repairs and alterations of RTE-LLPs governed by Title 14 of the Code of Federal Regulations (CFR) Part 33 (14 CFR part 33).

### 2. BACKGROUND.

a. During the past year, the Engine and Propeller Directorate (E&PD) observed shortcomings in the technical and substantiation data used to support approval for repairs to RTE-LLPs. Specifically, data to support compliance to §§ 33.14 and 33.27 was incomplete or missing. We also noted that these repairs were not properly coordinated with the appropriate ACOs.

b. In addition, we learned of repairs to RTE-LLPs that were assessed as minor without appropriate technical rationale to justify why the proposed repair was minor.

c. While the E&PD works on publishing the advisory circular for turbine engine repairs and alterations, this policy memorandum provides interim guidance to improve coordination and the quality of technical and substantiation data for RTE-LLP repairs and alterations.

### **3. RELATED DOCUMENTS.**

- a. Order 8110.37, Designated Engineering Representative (DER) Guidance Handbook.
- b. Order 8110.4, Type Certification.

### **4. POLICY STATEMENT.**

- a. Processing of Repairs and Alterations of Rotating Turbine Engine-Life-Limited Parts.

(1) As part of the justification to determine if a proposed repair or alteration to an RTE-LLP is a minor repair or alteration, the applicant is expected to assess the impact of the repair or alteration on the life of the RTE-LLP using an approved procedure, i.e. life methodology. This is supported by § 33.14, which requires that the FAA approve the procedure that is used to establish the life of an engine part. Due to the technical issues involved in developing a life methodology, the Project ACO (PACO), in coordination with the Certificate Management ACO (CMACO) and the E&PD Standards Staff, must review for approval the applicant's life methodology proposal before the assessment is made.

(2) Under 14 CFR part 43, engine maintenance or alteration must result in an engine that is at least equal to its original or properly altered condition. Therefore, to review an applicant's proposed repair or alteration, we must have sufficient data from the applicant to substantiate that the proposed repair or alteration does not reduce or degrade the function or characteristics of the part's type design (for example, a decrease in the fatigue characteristics or strength capability). If a proposed repair or alteration might result in a reduction in the life or overspeed capability of the engine, the E&PD will consider the repair or alteration to be major. If we determine that a proposed major repair will result in a change to the type design, the action is then outside the scope of a repair and is considered a major alteration. The applicant may be required to obtain an STC for approval of the major alteration.

(3) If the repair or alteration is major, then the DER, per Order 8110.37, must contact the PACO for guidance since RTE-LLPs are critical parts. Order 8110.4 requires that the PACO coordinate with the CMACO and notify the E&PD Standards Staff on projects that involve critical engine parts. However, due to the complexity of these projects, the PACO will forward the applicant's proposed major repair or major alteration data to the CMACO for review for approval.

- b. Supporting Information for Major Repair or Major Alteration for an RTE-LLP.

(1) In support of the CMACO's review for approval of a proposed major repair or major alteration for an RTE-LLP, we expect the applicant, at a minimum, to:

- (a) Ensure the original part's functional capability is retained.
- (b) Assess the impact of the repair or alteration on the part, its next higher assembly, and the engine on which the repaired or altered part is eligible for installation.
- (c) Show compliance with all applicable sections of part 33, particularly with the requirements of §§ 33.14 and 33.27, for the most severe engine conditions on which the repaired or altered part is eligible for installation.
- (d) Provide detailed repair or alteration instructions to ensure that the proposed procedure can be performed in a consistent and repeatable manner.
- (e) Identify the critical steps in the repair or alteration process that need source qualification and establish the pertinent criteria.
- (f) Provide instructions for supplementary identification of the part (maintain the original Part and Serial Numbers) and for updating the engine records to ensure that if a problem occurs all affected parts can be identified and tracked.
- (g) Retain and assume responsibility for the repair or alteration data to support continued operational safety of the engines with the repaired or altered parts installed.

(2) The CMACO's review of the proposed major repair or major alteration must consider whether an applicant possesses the following skills to properly evaluate whether the repair is proper:

- Design Engineering
- Life Management
- Thermal and Stress Analysis
- Manufacturing Engineering
- Material Engineering
- Non-Destructive Inspection
- Quality Assurance
- Product Support Engineering
- Repair Development Engineering

**5. 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 applicant's proposal must be coordinated with the E&PD Standards Staff, ANE-110.

**6. CONCLUSION.** In summary,

a. The E&PD considers an approved life methodology essential to assess the impact of a proposed repair or alteration on the life of an RTE-LLP. This assessment is necessary as part of the justification of minor repairs or alterations.

b. The E&PD considers repairs or alterations that might affect life, overspeed capability, or other critical characteristics of a RTE-LLP to be major.

c. The CMACO will review for approval all major repair or major alteration data for RTE-LLPs.

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