



Federal Aviation
Administration

Memorandum

Date: May 16, 2012

To: Manager, Engine Certification Office, ANE-140

From: Peter White, Engine and Propeller Directorate, ANE-100

Prepared by: James Rosa, ANE-141

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for General Electric, Aviation's project on CT7-8A6 and CT7-8A7 Engines, FAA Project # AT3073EN-E

ELOS Memo Number: 8040-ELOS-12-NE04

Regulatory Reference: 14 CFR §§ 33.87, 33.99 and 21.21

This memorandum informs the certificate management aircraft certification office of an evaluation made by the Engine and Propeller Directorate on the establishment of an equivalent level of safety finding for the CT7-8X (CT7-8A6 & CT7-8A7) engines.

Background

General Electric, Aviation proposed to show an ELOS to endurance test requirements of § 33.87(d), (f) and Special Condition 33-005-SC due to a need to replace the stage 1 high pressure turbine (HPT) blades during the test to complete two remaining cycles out of 25 required endurance test cycles. § 33.99(b) requires additional tests if a major repair or replacement of a part is found necessary during the endurance test.

Applicable regulations

14 CFR §§ 33.87, 33.99 and 21.21

Regulations requiring an ELOS finding

14 CFR § 33.87

Description of compensating design features or alternative Methods of Compliance (MoC) which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

Root cause was determined to be inadequate cooling of the stage 1 HPT blades. General Electric proposed to satisfy 14 CFR § 33.87, endurance test requirements by replacing the parts with conforming stage 1 HPT blades that had previously been run a full 150 endurance test hours plus 2 hours of one engine inoperative (OEI) testing on a different engine model. In addition GE has met the following compensating factors: design and production actions were taken to eliminate the cause for failure, analytical tools were validated, the replacement blades were of the same type design and data submitted to show that, due to ambient conditions, the different engine model endurance test was at least as severe as the -8X endurance test.

Explanation of how design features or alternative Methods of Compliance (MoC) provide an equivalent level of safety to the level of safety intended by the regulation

GE provided data that complied with the compensating factors identified above. In addition, continuation of the endurance test after replacement of the stage 1 HPT blades, demonstrated that conforming stage 1 HPT type design blades have passed the endurance test and therefore have shown compliance to 14 CFR § 33.87(d), (f) and Special Condition 33-05-SC.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned equivalent level of safety finding in project issue paper AT3073EN-E. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Accountable Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of the ELOS. This ELOS Memorandum number must be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's & ATCs) or in the Limitations and Conditions section of the STC. An example of an appropriate statement is provided below.

Equivalent Level of Safety Findings have been made for the following regulation(s):

14 CFR § 33.87, endurance test (documented in ELOS Memo 8040-ELOS-12-NE04).

//original signed by Robert Ganley for ANE-100//

5/17/2012

Manager, Engine and Propeller Directorate
Aircraft Certification Service

Date