Federal Aviation Administration

Memorandum

Date: June 30, 2009

To: Jorge Castillo, Acting Manager, Rotorcraft Standards Staff, ASW-110

From: Mark R. Schilling, Acting Manager, Rotorcraft Directorate, ASW-100

Prepared by: Eric Haight, Rotorcraft Standards Staff, ASW-111

Subject: Equivalent Level of Safety (ELOS) Finding for Bell Canada Certification/Type Validation on a Bell Model 429 Helicopter.

ELOS Memo No.: TC2486RD-R/P-1

Regulatory Ref: 14 CFR part 27 Appendix C – (14 CFR 29.903(b) Engines; Category A; Engine Isolation)

This memorandum documents concurrence with an ELOS finding for the Bell Model 429 helicopter.

Background

The proposed design of the Model 429 includes engine oil cooler fans for both engines and the transmission mounted on a common section of the tail rotor drive shaft (TRDS). In the event of failure of this section of the TRDS, or a section between this section and the main transmission, engine and transmission cooling would be greatly reduced.

14 CFR 27 - Appendix C, §29.903(b), for Category A operation requires engine isolation such that failure or malfunction of any engine, or the failure of any system that can affect any engine, will not 1) prevent the continued safe operation of the remaining engines; or 2) require immediate action, other than normal pilot action with primary flight controls, by any crewmember to maintain safe operation.

Bell Helicopter Textron Canada, Limited applied to Transport Canada Civil Aviation (TCCA), the Certification Authority and FAA as the Validation Authority for an ELOS to address engine isolation, 14 CFR 29.903(b). TCCA has granted an ELOS finding.

Applicable Regulation(s)

14 CFR 27-Appendix C, 14 CFR 29.903(b)

Regulation(s) requiring an ELOS finding

14 CFR 27 Appendix C, 14 CFR 29.903(b)

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)

1. Engine and transmission bench testing demonstrated that loss of drive to both engine oil cooler blower fans did not affect continued safe flight or require autorotation.

2. The Model 429 drive system design assessment concluded that all identified failure modes and their associated realization potentials are acceptable via a combination of design redundancy, margin of safety, test substantiation, and maintenance or pilot procedure.

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

The Rotorcraft Standards Staff has determined based on the above compensating factors that the Bell Model 429 design does provide an ELOS, in lieu of literal compliance with the requirements of 14 CFR 27-Appendix C, 14 CFR 29.903(b), for Category A operation to show acceptable engine isolation.

FAA approval and documentation of the ELOS finding:

The FAA has approved the aforementioned ELOS finding in project issue paper P-1. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Rotorcraft Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS memorandum should be listed in the Type Certificate Data Sheet (TCDS) under the Certification Basis section. As example:

Equivalent Safety Finding has been made for the following regulation:

14 CFR 27-Appendix C, 14 CFR 29.903(b), Engines, Category A; Engine Isolation documented in ELOS Memo TC2486RD-R/P-1.

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7-16-09

Date