Federal Aviation Administration

Memorandum

Date: October 6, 2014

To: Larry Kelly, Manager, Rotorcraft Standards Staff, ASW-110

From: Kim Smith, Manager, Rotorcraft Directorate, Aircraft Certification Service, ASW-100

Prepared by: Matt Wilbanks, Project Officer, ASW-111

Subject: Equivalent Level of Safety (ELOS) Finding for the Part Time Display of Vehicle Parameters on the Airbus Helicopters Deutschland GmbH MBB-BK117 D-2 Amended Type Validation Project, FAA Project SP4262RD-R

ELOS Memo#: SP4262RD-R-F-01

Regulatory Ref: 14 CFR §§ 29.1305, 29.1351(b)(6), 29.1435(a)(3)

This memorandum informs the certification management office of an evaluation made by the Rotorcraft Directorate on the establishment of an equivalent safety finding for the part time display of vehicle parameters on the Airbus Helicopters Deutschland GmbH (AHD) MBB-BK117 D-2.

Background:

The AHD MBB-BK117 D-2 has a new integrated modular avionics suite which allows for the de-selection (non-continuous display) of aircraft systems instruments required by 14 CFR §§ 29.1305, 29.1351, and 29.1435.

§§ 29.1305, 29.1351, and 29.1435 establishes the required powerplant, systems, electrical and hydraulic instruments, along with the caution and warning annunciations, that must be displayed within the view of the pilot. These instruments have traditionally been independent instruments and are needed, not only to determine the condition and health of the rotorcraft, but to allow the pilot to quickly assess trend or rate of change information, proximity to individual parameter limits and accurately compare engine-to-engine data.

Applicable regulation(s):
14 CFR §§ 29.1305, 29.1351, 29.1435

Regulation(s) Requiring an ELOS Finding:
14 CFR §§ 29.1305, 29.1351(b)(6) and 29.1435(a)(3)

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 the equivalency)
The following compensating features have been evaluated during FAA flight evaluations:

- The integrated modular avionics system provides full time parameter monitoring in the background when the parameters are not displayed. The system provides suitable annunciations that make the crew aware when a given part time displayed parameter's behavior needs to be monitored by the pilot. Trend monitoring is also performed to notify the crew if abnormal behavior of a vehicle parameter, even inside the normal operating range, is detected.
- The display of a part time displayed specific parameter can be manually selected by the flight crew at any time.

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

Engine and main gearbox oil pressure and temperature, hydraulic pressure, and electric system parameters are permanently monitored in the background. When the normal operating range behavior trend of one of these parameters indicates that it will reach a limit, an alert is provided to the flight crew prior to actually reaching the limit. The alert allows for almost immediate indication of the problem, typically well before the pilot would have noticed the trend from a routine scan. Additional alerts are provided in the event that a limit is exceeded. The requirements of 14 CFR §§ 29.1305, 29.1351(b)(6) and 29.1435(a)(3) have been adequately demonstrated.

FAA approval and documentation of the ELOS finding:

The FAA has approved the aforementioned equivalent level of safety finding in project issue paper F-01. 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 number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's & ATC's). An example of an appropriate statement is provided below.

Equivalent Level of Safety Finding has been made for the following regulations:

14 CFR § 29.1305 Powerplant Instruments; 29.1351(b)(6) Electrical Systems and Equipment, General; and 29.1435(a)(3) Hydraulic Systems (documented in ELOS Memo SP4262RD-R-F-01).

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Manager, Rotorcraft Directorate, Aircraft Certification Service — Date

ELOS Originated by Rotorcraft Standards Staff	Rotorcraft Standards Staff Manager: Larry M. Kelly	Routing Symbol: ASW-110