

Proposed Temporary Deviation on CS29.1337 (e) and CS29.1305 (a)(23) for online chip detection and warning system on Intermediate Gearbox and Tail rotor Gearbox (IGB & TGB)

**DHRUV (ALH) Advanced Light Helicopter type,
models DHRUV-C, DHRUV-CFW and DHRUV-CS**

Introductory note:

The hereby presented Temporary Deviation has been classified as important and as such shall be subject to public consultation, in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) of which states: "2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."

STATEMENT OF ISSUE:

DHRUV (ALH) Main Gear Box and Auxiliary Gear Box (MGB & AGB) feature electrical chip detectors, which provide chip indication during flight to the crew in case of any ferromagnetic particles generated inside the gearboxes. These chip detectors are present at input to MGB & AGB lubricating oil pumps of the pressurized lubrication circuit and are equipped with a zipper system for chip burning either under inhibit or auto mode.

However, IGB and TGB employ non-electrical magnetic plugs. Those ones also allow collecting ferromagnetic particles, but they do not provide any warning during flight to the crew. Hence, IGB and TGB do not comply with the requirement as prescribed in Certification Specifications (CS) 29.1337 (e) which states that:

"(e) Rotor drive system transmissions and gearboxes utilizing ferromagnetic materials must be equipped with chip detectors designed to indicate the presence of ferromagnetic particles resulting from damage or excessive wear within the transmission or gearbox. Each chip detector must:

- (1) Be designed to provide a signal to the indicator required by CS 29.1305(a)(23); and*
- (2) Be provided with a means to allow crewmembers to check, in flight, the function of each detector electrical circuit and signal".*

The Applicant has requested from EASA a time-limited deviation from compliance to CS 29.1337 (e) and CS 29.1305 (a)(23), which is proposed to be completed as a post-TC activity. This would allow the Applicant time to make the required design changes to the IGB & TGB magnetic plugs and the aircraft warning and caution device.

EASA has agreed to this deviation request subject to the following conditions:

- EASA agreement with technical evidences submitted by the Applicant that the current design already shows an acceptable level of safety based on compensating provisions available with respect to design features, failure mode analysis, service experience, manual chip detector inspections and monitoring provisions.
- EASA agreement with the details of the necessary design changes.
- The Applicant must provide a recovery plan as Post TC activity presenting the proposed timescale to eliminate the IGB & TGB design non-compliance to CS 29.1337 (e) and CS 29.1305 (a)(23). This deviation would be time-limited after Type Certification and at the latest till the date of delivery of the first DHRUV (ALH) to a EU Member State.

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