LEONARDO

HELICOPTERS DIVISION

TECHNICAL INFORMATION LETTER

TIL N° **T-139-22-002**
T-169-22-002
T-189-22-003

DATE: **March 10, 2022**

REV.: **/**

To: Leonardo Helicopters products
Owners / Operators / Service Centres

SUBJECT: **HUMS TVM Thresholds Refinement Update**

Helicopters Affected: AW139, AW169, AW189 with HUMS systems installed

References:

[1] AW139-21-113 dated 18 March 2021 HUMS TVM thresholds refinement

[2] AW169-21-025 dated 18 March 2021 HUMS TVM thresholds refinement

[3] AW139-21-031 dated 18 March 2021 HUMS TVM thresholds refinement

Dear Customer,

Leonardo Helicopters (LH) is pleased to inform that a new review of the AW139/AW169/AW189 HUMS Transmission Vibration Monitoring (TVM) thresholds and their learning limits has been completed.

As anticipated with the communications at Reference [1], [2] and [3], the set of thresholds has been monitored since the release in Heliwise. The continuous process of collecting and analysing a data set from more than thousand helicopters leaded to a re-tuning phase of some threshold criteria.

The aim of the second step of the TVM thresholds refinement is to keep minimizing the number of false alerts and increase the system reliability that is reached through the implementation of the following improvements:

- Thresholds Type Update: based on the results of fleet analyses, the thresholds of specific Health Indexes (HIs) have been modified from Temporary to Permanent state. This change improves the monitoring of the components that have shown a consistent vibrational pattern across the entire fleet.

- Threshold Level: the distribution of the aggregated data recorded was used to update the set value of specific thresholds. The threshold level influences the monitoring sensitivity and the false alerts rate.
- Learning Limits Update: based on the result of the fleet analyses, the upper and lower learning limits of certain combinations of Acquisition and HI have been modified (this applies exclusively to auto-learning thresholds family). This change improves the monitoring of the components whose values should be inside of defined boundary levels. When the new Learning Limits Update will be released in service, the involved learned thresholds will be reset in accordance with the following scheme:
  1. The current threshold value is lower than new Lower Limit: the threshold value was learned too low and a threshold reset is automatically performed by LH in order to reduce the false positive occurrences.
  2. The current threshold value is between the new Lower and Upper Limit: the threshold has the appropriate value to monitor the related HI.
  3. The current threshold is higher than the new Upper Limit: the threshold value was learned too high and a threshold reset is automatically performed by LH in order to improve the monitor capability. In case the values of an HI are above the new Upper Limit, the acquisition will generate arising and possible corrective actions will be required.
- Trend Thresholds Updated: the Baselines thresholds of certain HIs have been deactivated as they do not provide any additional information to improve the related HI trend analysis. This applies only for AW189 and AW169 products.

With reference to the AW139 helicopters equipped with AGB (Accessory GearBox) the statistical approach based on the fleet data analysis introduced with the thresholds refinement (Reference [1]) has been applied: a new set of thresholds has been released in Heliwise prior to apply the Thresholds Refinement Update.

In order to introduce as smoothly as possible the new activity, LH has performed a dedicated analysis to define a list of helicopters that will potentially generate arising following the new Threshold Update: before this update is released to service on March 21, 2022, LH will take care to proactively advising the affected Customers, providing the IETP maintenance procedures to fit the specific HIs behaviour within the new threshold levels.

If following the implementation of threshold refinement update a TVM arising will occur, the Customer is kindly asked to follow the applicable Fault Isolation procedures, available in the AFIP information set of the IETP, and, if necessary, to open a request through the Heliwise Query Management function.

For all the Customers who are covered by the HUMS Full Support Service, please consider that the management of the thresholds is performed by LH HUMS Support Team: any corrective action will be communicated through the already foreseen HUMS data analysis reports.

Should you need any additional information, please do not hesitate to contact LH HUMS Support Team at hums.mbx.aw@leonardo.com functional mailbox.

Yours Sincerely,

Gabriele Bordino
Head of Product Support Engineering

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