



Certification Memorandum

Vibration Health Monitoring: Prioritisation of Maintenance Alerts

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Regulatory requirement(s): CS 29.1465

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Log of issues

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1. Introduction

1.1. Purpose and scope

The purpose of this Certification Memorandum is to supplement the existing guidance for compliance with CS 29.1465 – Vibration Health Monitoring, specifically with respect to the issue of prioritisation of Alerts.

1.2. References

It is intended that the following reference materials be used in conjunction with this Certification Memorandum:

Reference	Title	Code	Issue	Date
CS-29	Certification Specifications for Large Helicopters	CS-29	Amdt 3	12/2012
AMC29.1465	Vibration health monitoring	CS-29	Amdt 3	12/2012

1.3. Abbreviations

AC	Advisory Circular
AMC	Acceptable Means of Compliance
CM	Certification Memorandum
CS	Certification Specification
EASA	European Aviation Safety Agency
FAA	Federal Aviation Administration
ICA	Instructions for Continued Airworthiness
VHM	Vibration Health Monitoring

1.4. Definitions

Alert	An indication produced by the VHM system that requires further processing or investigation by the operator to determine if corrective maintenance action is required.
Alarm	An Alert that, following additional processing or investigation, has resulted in a maintenance action being required.
False Alert	This is an Alert that after further processing or investigation has been determined to not require any further action.
False Alarm	An Alert that after further processing or investigation has resulted in unnecessary maintenance action.



2. Background

Service experience over recent years has shown that it is beneficial to have some form of prioritisation hierarchy of Alerts, in order to show which are the most significant and / or urgent. Also, it is necessary to distinguish for which Alerts verification of the False Alert /Alarm status and any associated corrective maintenance actions must be performed prior to continuing flight. For convenience the definitions of Alerts and Alarms provided in AMC 29.1465 are repeated in Section 1.4 above.

The AMC to CS 29.1465 as published in CS 29 Amdt 3 has been found not to provide sufficient guidance regarding the prioritisation of Alerts and to allow standardisation of the use of colours in relation to the urgency / importance of subsequent investigation and associated maintenance action. Accordingly, in addition to AMC 29.1465, consideration should be given to Section 3 of this Certification Memorandum when demonstrating compliance with CS 29.1465.

3. EASA Certification Policy

3.1. EASA Policy

- (a) Alerts to maintenance personnel should:
- (1) provide the maintenance personnel with the information needed to:
 - (i) identify abnormal health indicator conditions, and
 - (ii) determine any appropriate actions;
 - (2) be readily and easily accessible and intelligible to the responsible maintenance personnel;
 - (3) be removed when the alerting conditions no longer exists.
- (b) Alerts should be categorized and reflect the following prioritisation hierarchy based on the urgency of maintenance personnel awareness and action:
- (1) Highest severity category (example Level 1): For Alerts that require immediate maintenance investigation (normally before next flight or, when specifically stated in Instructions for Continued Airworthiness, prior to the next day's flying) and necessary corrective actions in accordance with the applicable Instruction for Continued Airworthiness (ICA).
 - (2) Medium severity category (example Level 2): For Alerts that require maintenance investigation in accordance with the applicable Instruction for Continued Airworthiness (ICA) . Operation of the helicopter may be continued in close monitoring whilst determining the status of the Alert (i.e. Alarm, VHM system failure or False Alert) and any subsequent corrective action that may be necessary.
 - (3) Advisory/lower severity category (example Level 3) : For Alerts that require maintenance investigation in accordance with the applicable Instruction for Continued Airworthiness (ICA) or further analysis by VHM specialists . Operation of the helicopter can be continued whilst determining the status of advisory alert.

Note: The applicant may choose to include "advisory category" alerts within the second category as referred in sub-paragraph (2)

- (c) Visual ground station alert indications should:
- (1) conform to the following colour convention:
 - (i) Red for highest severity alert indications.
 - (ii) Amber or yellow for medium severity alert indications.
 - (iii) Any colour other than green for Advisory/lower severity alert indications, provided the colour differs sufficiently from the colours prescribed in sub-paragraphs (i) and (ii) to avoid possible confusion.



- (d) Use of the colours on the ground station for any purpose other than maintenance personnel alerting should sufficiently differ from the ones used for the alerts as prescribed in paragraph 3.1 (c) to avoid possible confusion and adverse effect on maintenance personal alerting.

3.2. Who this Certification Memorandum Affects

Designers of helicopters utilising vibration health monitoring and specifically those complying with CS 29.1465.

4. Remarks

1. Suggestions for amendment(s) to this EASA Certification Memorandum should be referred to the Certification Policy and Safety Information Department, Certification Directorate, EASA. E-mail CM@easa.europa.eu or fax +49 (0)221 89990 4459.
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