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Title	Vibration Health Monitoring
NPA Number	NPA 2010-12

UK CAA (European.Affairs@caa.co.uk) has placed **12** unique comments on this NPA:

Cmt	Segment description	Page	Comment	Attachment
47	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 1: Add a new CS 29.1465 to Book 1	12	<p>Paragraph No: Book 1 Subpart F Equipment CS 29.1465 Vibration Health Monitoring</p> <p>Comment: To better meet the intent of selecting Option 3, it is suggested that the text of the new CS 29.1465 be amended to explicitly include the case when VHM might be required by operational rules, in a similar manner to the Cockpit Voice and Flight Data Recorders at CS 29.1457 and 1459</p> <p>Justification: Clarification of purpose.</p> <p>Proposed Text: Amend paragraph: CS 29.1465 Vibration Health Monitoring</p> <p>If certification of a rotorcraft with vibration health monitoring of the rotors and/or rotor drive systems is requested or required by the applicable operating rules, then the design and performance of the vibration health monitoring system must meet the requirements of this paragraph.</p>	
48	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - b. Procedures	13	<p>Paragraph No: 4(b)(1)(iii)</p> <p>Comment: Typographical error in the single line of text</p> <p>Proposed Text: Change "requirements" to "requirement"</p>	
49	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - b. Procedures	13	<p>Paragraph No: 4(b)(3)</p> <p>Comment: The first sentence (taken from the draft rule) states that VHM must be provided, <i>when it can increase the likelihood of early detection</i> while the second sentence effectively says that it does not, if other compensating provisions are available. The second sentence in this AMC paragraph does not seem to be consistent with what is in the proposed rule. From the text in the rule, it is the possible increased likelihood of detection which should be assessed, not whether other provisions are available. (i.e. if it can add to detection capability, then it should be fitted).</p> <p>Justification:</p>	

			The AMC material and the rule should be consistent.	
50	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - c. Definitions	14	<p>Paragraph No: c. Definitions</p> <p>Comment: Add definition of 'Close Monitoring'</p> <p>Justification: This is a key process within the post alert diagnostic stage between operator and TCH/ 3rd party specialist diagnostic support provider; and has implications for MEL use. Text taken from CAA publication, CAP 753.</p> <p>Proposed Text: Add new paragraph: "(13) Close Monitoring: This may be required when a VHM component or indicator requires focused and increased monitoring, e.g. in the event that an indicator value exceeds a "maintenance action" threshold or shows other signs which warrant increased attention. The close monitoring procedure typically reduces the maximum period between successive indicator downloads to no more than 10 hours. Note that close monitoring is not intended to be a long-term solution, but a period of heightened monitoring, diagnostic support and assessment to ensure that determinations of serviceability are made using all the data available."</p>	
51	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - e. System Design Considerations	14 - 17	<p>Paragraph No: (i), (ii) below Table 1.</p> <p>Comment: Paragraphs (i) and (ii) both contain the comment in brackets "does not meet the criteria for gear monitoring". The comment is therefore highlighting a limitation of the technique, and is not in keeping with the rest of the paragraph, which highlights the particular advantages of each technique described.</p> <p>Justification: To be consistent with the other sub-paragraphs, an indication of the strengths of particular techniques would be useful, rather than what they are not useful for.</p>	
52	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - h. Pilot Interface	17	<p>Paragraph No: h. Pilot Interface</p> <p>Comment: Clarify that cockpit warnings to aircrew are not recommended.</p> <p>Justification: VHM by nature is based on identifiable trends over the medium to long term period (typically 30-300 hours) and the warning may indeed be transient. Cockpit in-flight warnings may lead crew to take inappropriate ditching action, leading to reduced occupant safety.</p> <p>Proposed Text: Amend paragraph: "h. Pilot Interface Pilot interaction with the VHM system, if any, should be specified and should not adversely impact on pilot workload. <i>The use of in-flight cockpit VHM alerts is not recommended.</i>"</p>	
53	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4:	17	<p>Paragraph No: (i) Maintenance Personnel Interface</p> <p>Comment: The paragraph as written describes the responsibilities of</p>	

	Add a new AMC 29.1465 - i. Maintenance Personnel Interface		<p>maintenance personnel in the process. This is not appropriate for a product certification code. It is not clear what the intent of the paragraph is; if it is to ensure that the applicant provides the necessary information to allow maintenance personnel to carry out the task effectively, then the paragraph should be reworded to make it clear what the applicant should provide.</p> <p>Justification: The guidance material supplied should be aimed at the applicant for the approval, not maintenance personnel, whose duties are covered by other EASA codes.</p> <p>Proposed Text: Amend paragraph: "Information should be provided by the applicant to ensure that personnel responsible for releasing ..." etc.</p>	
54	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - n. Performance Criteria	18 - 19	<p>Paragraph No: n. (2) Data transfer and storage capability</p> <p>Comment: Add additional requirement for Groundstation to alert maintenance personnel when the VHM has not generated a 'Maintenance Log' due to download medium 'lock up' on shutdown.</p> <p>Justification: Potential AAIB recommendation from G-REDL Fatal accident. If no Maintenance log is processed then the system may show 'all green ' icons on ground station when in fact an alert may be present</p> <p>Proposed Text: Add paragraph: "The data transfer process should be capable of downloading partial data sets to the Ground-Based System if for any reason a complete data set for every monitored component has not occurred. The ground station should alert maintenance personnel/aircrew when during post flight actions the creation of a 'Maintenance log' has not been possible due to download medium 'lock-up' "</p>	
55	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - n. Performance Criteria	18 - 19	<p>Paragraph No: n. (3) VHM Alert generation and fault detection performance</p> <p>Comment: Though reference is made to a claimed probability of detection, there is no definition of what an acceptable rate would be. It is presumed that this was discussed within the group but it was decided against including any numerical levels. As a minimum there should be some reference to a rate of detection that is acceptable to the Agency.</p> <p>Justification: As written, it appears that there is nothing to prevent an applicant declaring their own criteria for an acceptable rate, and this rate varying considerably between applicants. As stated in the explanatory note (Page 8, 4 a ii, Option 1) one aim of the NPA is to avoid varying standards being presented to the agency.</p> <p>Proposed Text: Amend first sentence: "The Alert and Alarm generation processing should be</p>	

			designed to achieve a claimed probability of detection <i>that is acceptable to the Agency</i> for each component defect being monitored.
56	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - o. Performance Validation	19 - 20	<p>Paragraph No: o) Performance Validation, Note under 1(C)</p> <p>Comment: It is stated that <i>it is recommended that</i> a mechanism be established for requesting maintenance feedback with respect to component monitoring failure/degradation. This does not place sufficient emphasis on this important aspect of a CSI.</p> <p>Justification: It has become clear from experience that feedback from investigations into removals from service is a fundamental element of understanding the performance of the VHM system, to aid in the determination of false alert rates, detection system successes etc., both during and after the CSI phase. It is therefore important that the feedback system for removals and other relevant investigations is formally declared to EASA at the start of the CSI, to allow EASA to monitor during the CSI. A separate section under this paragraph should be introduced in place of the note to give this aspect sufficient emphasis.</p> <p>Proposed Text: Delete the note and add text under a separate sub paragraph of this section: "D) information from module strips, component removals, inspections and other investigations which is relevant to the review of VHM system performance."</p>
57	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - t. Minimum Equipment List (MEL) Recommendation	23	<p>Paragraph No: t. MEL Recommendation</p> <p>Comment: There should be provision for a reduced MEL limit, 10 hours where a VHM alert is being monitored through a 'Close Monitoring' phase. (CAA policy item 45-1).</p> <p>Justification: With an active alert being monitored, a 25 hour rectification interval will reduce the level of safety for what may be a developing fault</p> <p>Proposed Text: Amend paragraph: "The MEL should address the Airborne Element of the VHM system. The maximum period for absence of an assessment of any VHM indicator, to which Alert criteria are applied, should be limited to a suitable period and should not exceed 25 hours or 10 hours for a component which is subject to 'close monitoring'"</p>
58	B. Draft Decisions - I. Draft Decision CS-29 - Proposal 4: Add a new AMC 29.1465 - u. Controlled Service Introduction	23	<p>Paragraph No: u. (2) (iii)</p> <p>Comment: This paragraph highlights the need to check that, in the event of failures or defects in monitored components, then the VHM should provide a timely alarm. Information concerning the nature of the defect or failure may be required to allow the type of alarm which should have triggered to be determined. This would only come from the investigation findings.</p> <p>Proposed Text: Add a sentence: "The information from the investigation findings of such</p>

failures and defects should be made available to enable a review of the system effectiveness.”

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