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1	*Alessandro Bandera*	Definitions	3	Alarm: which system generates the alarm after the Alert? Which system recognize the" following additional processing or investigation"? Which system resets the alert/alarm after intervention?		Observation		Not accepted	*The questions are not related to the proposed EASA certification policy:* The definitions of "Alert" and "Alarm" as provided in the Certification memo have been harmonized through NPA2010-12 and are currently published in AC29-1465 and incorporated in CS-29 Amdt 3. They are only repeated in section 1.4 of the Certification Memo for convenience. Further information regarding VHM system requirements and associated Means of compliance can be found in AC29-1465.
2	*Alessandro Bandera*	EASA Policy(c)	4	Colour Hierarchy: level 1 ,red; level 2,amber; level 3, yellow? Is it correct?		Observation		Noted	The colour hierarchy proposed is typical in the aviation world. The EASA Policy referred in paragraph 3.1(c)(1)(ii) defines the yellow colour as similar to "Amber" and thus acceptable for level 2 Alerts
3	*Alessandro Bandera*	EASA Policy(d)	4	"on the ground station for any purpose other than maintenance personnel alerting". So who read the alerts? Are the Alert &Alarm both on board and ground station?		Observation		Not accepted	*The questions are not related to the proposed EASA certification policy:* The purpose of this sentence is to prevent the colours from being used for other Ground Station information, so as to minimize the risk of confusion. Alerts are analysed by maintenance personnel. Further information regarding VHM system requirements and associated Means of compliance can be found in AC29-1465.
4	*GE Aviation Systems Ltd.*	3.1	4	Levels 1 to 3 are reversed with respect to the severity used on the GE HUMS platform that is widely adopted on the majority of UK MoD Rotorcraft (Sea King, Chinook, Lynx) and many commercial aircraft worldwide (AW139, Super Puma etc.). GE colour coding also differs for the lowest severity by typically using yellow.	Suggest changing the logic to match existing GE HUMS logic that operators are used to: Level 3 – Red is the highest severity alert. Level 2 – Amber, medium severity. Level 1 –Yellow/Clear/Other, lowest severity.	Suggestion		Partially accepted	The aim of the certification memo is to provide guidance regarding the prioritisation of Alerts and allow standardisation of the use of colours in relation to the severity. Considering the proposed changes, it is agreed to make references to "categories" and keep the levels only as example. See proposed changes below. • Highest severity category (example Level 1): RED • Medium severity category (example Level 2): AMBER OR YELLOW • Advisory/lower severity category (example Level 3): Any colour other than green, provided the colour differs sufficiently from RED and AMBER/YELLOW. EASA considers that yellow does not sufficiently differ from Amber and thus should only be used in place of "Amber".
5	*GE Aviation Systems Ltd.*	3.1	4	It's not stated whose responsibility it is to define what exceedance level would cause maintenance action. Realistically, this can only be defined by the airframer/OEM or operator, not the HUMS provider.	Suggest adding clarifying statement that it is the OEM/operators' responsibility to define what level of severity (1, 2 or 3) is applied to specific threshold value exceedances, not the HUMS supplier.	Suggestion		Not accepted	Applicability and associated responsibilities linked to this Certification Memorandum are with the applicant requesting approval of the VHM system in accordance with CS29.1465. Please refer to paragraph 3.2. as well as AC29.1465 paragraph (a) and (b) for further information.
6	*GE Aviation Systems Ltd.*	General	General	It's not clearly stated if these requirements should be applied to existing Helicopter HUMS installations or just new HUMS applications. It's also not clear whose responsibility (HUMS supplier or OEM/operator) it is to ensure the HUMS meets these requirements.	Suggest adding clarifying statement that it is the responsibility of the aircraft OEM/operators to ensure the HUMS meets these requirements, and a statement to clarify whether this is for new HUMS applications or all including existing install base.	Suggestion		Not accepted	Applicability and associated responsibilities linked to this Certification Memorandum are with the applicant requesting approval of the VHM system in accordance with CS29.1465. Accordingly, this CM will only be applied to new applications, which may or may not include approval of existing "HUMS installations" Please refer to paragraph 3.2. as well as AC29.1465 paragraph (a) and (b) for further information.

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7	*Andy Evans, Aerossurance Limited*	Overall	Overall	Strongly supportive of the overall intent of providing better general guidance for interface design (although it should be accepted that different VHM systems can have different detail interface design, if only to allow continuous improvement and innovation).	N/A	Yes	No	Noted	Thank you for supporting this certification Memorandum. Some changes have been adopted to allow more flexibility in achieving the intent of this CM.
8	*Andy Evans, Aerossurance Limited*	3.1(b)	4	The current definitions of actions for Levels 1, 2 and Advisory would be better defined in terms of maintenance actions within published ICA (Aircraft MM or / and 3rd party VHM designer's Diagnostic Manual or equivalent) of the operator's own procedures. It would also benefit separating Line Maintenance from Operator's / DO's VHM analysis specialist actions. Renaming Advisory as Level 3 would also be clearer.	*Leave introductory sentence unchanged and then state:* (1) Level 1 Message: Alerts that involve Line Maintenance action in accordance with Instructions for Continued Airworthiness and/or Operator specific additional procedures, prior to the next flight. (2) Level 2 Message: Alerts that involve Line Maintenance action in accordance with Instructions for Continued Airworthiness and/or Operator specific additional procedures and/or Operator/Design Organisation ad hoc instructions, including close monitoring of specific, relavent parameters between each flight. Continued flying is permissable. (3) Level 3 Message: Advisory information to be examined by the Operator's VHM Specialist and/or Design Organisation VHM Analyst (or their equivalents). No Line Maintenance action is required unless requested by these specialists or Operator Specific additional procedures. Add: (e) Instructions for Continued Airworthiness should also clearly identify these Levels when describing the response to ground station messages.	Yes	No	Partially accepted	References to the applicable ICA is proposed to be incorporated and this is obviously the role of such instruction to determine the management process as specified in the AC29.1465 paragraph (q). The proposed paragraph (e) is "noted" without changes as considered cover by the AC29.1465 paragraph (q) technical publications. The following changes are incorporated: (a) 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 (before next flight) 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 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.

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9	*Andy Evans, Aerossurance Limited*	3.1(b)(1)	4	One implication of using the term 'next flight' is that VHM data will be downloaded and examined between every flight. While it is usually appropriate to do this on some types for some failure modes on every flight, as regulatory aims should include simultaneously encouraging frequent downloads and greater 'warning time', it may be beneficial to allow 'before next day's flying' for specific failure modes where a case has be made by the Design Organisation.	*Replace:* ….prior to the next flight. *With:* …prior to the next flight (or, when specifically stated in Instructions for Continued Airworthiness, prior to the next day's flying. *Add:* (e) …Prior to the Issue of ICA the Design Organisation should justify the appropriateness of all Level 1 responses which are allowed to be conducted before the next day's flying (rather than before the next flight). For a new VHM that is undergoing a Controlled Service Introduction and is not derived from a previous system with extensive service experience, it would be prudent to always require a response prior to next flight until the CSI is completed, when case by case ICA change may be considered.			Noted / Partially accepted	As proposed, the reference to next flight has been modified and the determination will refer to the instructions for continued airworthiness. The paragraph (e) is noted and EASA agree with the approach and required justifications, however the current AC29.1465 paragraph (q) technical publications as well as (u) Controlled Service Introduction already cover those ICA and CSI aspects.
10	*Airbus Helicopters*	3.1 (b) and 3.1. (c)	4	Airbus Helicopters considers that it will be difficult to manage 3 alert indication types. As written in the proposed CM, level 2 alerts may need subsequent corrective action; however, in case the alert is a false alert, it becomes an advisory. Therefore, "Advisory" is just a second state for a "Level 2" alert.	Suggestion for subparagraph (b): - reword item (2) the following way: "*(2) Level 2: For alerts that require maintenance personnel awareness. Operation of the helicopter may continue in close monitoring whilst determining the status of Alert (i.e. Alarm, VHM system failure or False Alert). Corrective action will be applied after the Alert status (i.e. Alarm or System Failure).*" - remove item (3) Suggestion for subparagraph (c): remove item (iii).		Yes	Partially accepted	EASA agrees that lower severity (Level 3) alerts might not always be necessary and can be managed under medium/level 2 alerts. Investigation will determine the final severity of the alert. The below changes are taken into account: (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 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)
11	*Airbus Helicopters*	3.1 (d)	4	"*Use of the colours red, amber and yellow on the ground station for any purpose other than maintenance personnel alerting should be limited and should not adversely affect maintenance personnel alerting.*" The reason why "yellow" is considered in the list of reserved colours is not understood.	"*Use of the colours red and amber on the ground station for any purpose other than maintenance personnel alerting should be limited and should not adversely affect maintenance personnel alerting.*"		Yes	Partially accepted	Some design might already have incorporated "yellow" which is considered close and equivalent to amber. In order to clarify the intent of paragraph 3(d) the following is proposed: 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.

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12	*Bell Helicopter*	3.1 (c)	4	Proposed Guidance: 3.1 (c) Visual ground station alert indications should: (1) conform to the following colour convention: i. Red for Level 1 alert indications. ii. Amber or yellow for Level 2 alert indications. iii. Any colour other than green for Advisory alert indications, provided the colour differs sufficiently from the colours prescribed in sub-paragraphs (i) and (ii) to avoid possible confusion. Bell Helicopter Response: The system Bell has used on multiple models uses green to annunciate both a good/no action condition and, in conjunction with a symbol, advisories. Even thou the same color is used the addition of a symbol clearly differentiates the two and has resulted in no ambiguities on actions to be taken.	Bell Helicopter proposes the following: iii. Any colour/indicator design for Advisory alert indications is acceptable, provided the colour differs sufficiently from the colours prescribed in sub-paragraphs (i) and (ii) and the indicator used to indicated good/normal conditions to avoid possible confusion.			Not accepted	As quoted in CS29.1322, and seen in many daily life applications, green is associated to safe operation/system functioning without any defects. Green colour is a "GO" without any restriction. Any other approach can still be proposed as alternative means of compliance at time of compliance demonstration with CS29.1465; this will require dedicated assessment on a case by case basis. Any alerts, even for the lower severity which might require further investigation by the maintenance personnel, should sufficiently differ from red, amber/yellow and green with no risk of confusion.