

## Certification Memorandum

# Certification of Vibration Health Monitoring (VHM) Systems for compliance with Commission Regulation (EU) 2016/1199 introducing Annex V (Part-SPA) of Regulation (EU) No 965/2012 Subpart K, Helicopter Offshore Operations (HOFO).

EASA CM No.: CM-S-012 Issue 01 issued 30 April 2018

**Regulatory requirement(s): CS 29.1465, (EU) No 965/2012 Subpart K, Annex V (Part-SPA)**

In accordance with the EASA Certification Memorandum procedural guideline, the European Aviation Safety Agency proposes to issue an EASA Certification Memorandum (CM) on the subject identified above. All interested persons may send their comments, referencing the EASA Proposed CM Number above, to the e-mail address specified in the “Remarks” section, prior to the indicated closing date for consultation.

EASA Certification Memoranda clarify the European Aviation Safety Agency’s general course of action on specific certification items. They are intended to provide guidance on a particular subject and, as non-binding material, may provide complementary information and guidance for compliance demonstration with current standards. Certification Memoranda are provided for information purposes only and must not be misconstrued as formally adopted Acceptable Means of Compliance (AMC) or as Guidance Material (GM). Certification Memoranda are not intended to introduce new certification requirements or to modify existing certification requirements and do not constitute any legal obligation.

EASA Certification Memoranda are living documents into which either additional criteria or additional issues can be incorporated as soon as a need is identified by EASA.

## Log of issues

Issue	Issue date	Change description
01	30/04/2018	First issue.

## Table of Content

Log of issues.....	2
Table of Content .....	2
1. Introduction.....	3
1.1. Purpose and scope .....	3
1.2. References .....	3
1.3. Abbreviations.....	3
1.4. Definitions .....	3
2. Background.....	4
3. EASA Certification Policy .....	4
3.1. EASA Policy .....	4
3.2. Whom this Certification Memorandum affects .....	5
4. Remarks.....	5



## 1. Introduction

### 1.1. Purpose and scope

This Certification Memorandum provides further clarification regarding certification of Vibration Health Monitoring (VHM) capability for helicopter offshore operations, operating over hostile terrain as defined in Commission Regulation (EU) 2016/1199 introducing Annex V (Part-SPA) of Regulation (EU) No 965/2012 Subpart K, Helicopter Offshore Operations, and (SPA-HOFO).

### 1.2. References

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

Reference	Title	Certification Specification	Issue	Date
CS 29.1465	Vibration Health Monitoring	CS-29	4	30 Nov 2016
AMC 29.1465	Vibration Health Monitoring	CS-29	4	30 Nov 2016

### 1.3. Abbreviations

AMC	Acceptable Means of Compliance
CM	Certification Memorandum
CS	Certification Specification
DOAH	Design Organisation Approval Holder
EASA	European Aviation Safety Agency
FAA	Federal Aviation Agency
FAR	Federal Aviation Regulation
STC	Supplement Type Certificate
STCH	Supplement Type Certificate Holder
TC	Type Certificate
TCH	Type Certificate Holder
VHM	Vibration Health Monitoring

### 1.4. Definitions

All definitions as defined in AMC 29.1465 are applicable to this CM.



## 2. Background

As part of Commission Regulation (EU) 2016/1199 of 22 July 2016, certain specific safety risks from helicopter offshore operations were determined to be inadequately addressed by Regulation (EU) No 965/2012 with the consequence that additional operational requirements had been adopted by certain Member States. To address this situation, certain amendments have now been introduced into Regulation (EU) No 965/2012 in order to ensure that the safety objectives of Regulation (EC) No 216/2008 are achieved and that a level playing field is established for operators that conduct offshore helicopter operations.

Commission Regulation (EU) 2016/1199 adds to Annex V (Part-SPA) of Regulation (EU) No 965/2012 Subpart K, Helicopter Offshore Operations (HOFO). Within this section, paragraph 'SPA.HOFO.155 Vibration Health Monitoring (VHM) system' requires the introduction of a VHM system capable of monitoring the condition of critical elements of the rotors and their drive systems by the 1st January 2019, for all helicopters conducting CAT offshore operations in a hostile environment.

VHM systems are used to increase the likelihood of detection of dynamic component incipient faults in the rotor and rotor drive systems by providing prognostic capability to enable maintenance personnel to take timely corrective action. VHM systems typically monitor vibration through appropriately located sensors whose signals are processed to generate a set of condition and / or health indicators. Each indicator is then assessed against a defined health threshold, allowing the determination of the health status of the monitored component and whether any maintenance action is determined to be necessary.

In order for SPA.HOFO.155 to be effective, EASA considers that VHM systems should comply with an appropriate design certification specification, which in CS29 is addressed by 29.1465 (Vibration Health Monitoring). In particular CS 29.1465 (b) states that, if such a system is required by operating rules for the monitoring of rotors and/or rotor drive systems, its design and performance:

- Must provide reliable means of early detection for the identified failure modes being monitored.
- Must be assessed through a safety analysis that identifies all component failure modes that could prevent safe flight or safe landing, for which vibration health monitoring could provide reliable means of early detection.
- Should consider all typical VHM indicators and signal processing techniques.
- Must comply with the aforementioned requirements, unless other means of health monitoring can be substantiated.

The purpose of this CM is to clarify to operators and TCHs, the VHM design and performance certification specifications appropriate to meet SPA.HOFO.155 of Annex V (Part-SPA) of Regulation (EU) No 965/2012 Subpart K, Helicopter Offshore Operations (HOFO).

## 3. EASA Certification Policy

### 3.1. EASA Policy

- (a) As part of the process of compliance with SPA.HOFO.155 the applicant (operator) should verify that the design and performance of the VHM system has been approved and is compliant with an appropriate and recognized design certification specification. The competency and responsibility for the assessment of VHM capability should reside with the TCH / VHM STCH and not with the operator. In accordance with AMC SPA.HOFO.155, it will be necessary for the helicopter TCH (or STCH responsible for the design of the VHM system if this is not the TCH), to obtain EASA approval of the VHM system by demonstrating compliance with CS 29.1465. Continued airworthiness review of VHM performance will consequently be the responsibility of the TCH / STCH, thus ensuring that compliance with CS 29.1465 is maintained after certification and entry into service.

Note 1: For helicopters which are currently operating in accordance with national operating regulations which require VHM, an assessment of the VHM capability will have already been



performed by the operator. In addition, this assessment may have also included completion of a "controlled service introduction" (CSI) evaluation and been approved by the responsible national aviation regulator. Where this is the case, it is possible that the results of this evaluation could provide evidence of compliance with significant sections of CS29.1465, however, full compliance with CS29.1465 will still need to be demonstrated by the TCH or VHM STCH.

Note 2: Once compliance with CS29.1465 has been demonstrated, EASA will include a statement on the TCDS/STC stating that compliance with this certification specification has been achieved and that the scope of the VHM is acceptable for compliance with SPA.HOFO.155.

Note 3: AMC 29.1465 states: "A CSI Plan should be agreed between the applicant for VHM system certification and the Agency prior to initial approval of the VHM system. This plan should then be implemented by the VHM approval holder and the operator(s) and monitored periodically by the Agency." As compliance with SPA.HOFO.155 is achieved by certification of the VHM system in accordance with 29.1465, this only requires acceptance of the CSI Plan at the time of initial compliance with SPA.HOFO.155 and completion of the CSI within an agreed period is expected for continued compliance.

- (b) Applicability: This is as defined by Annex V (Part-SPA) of Regulation (EU) No 965/2012 Subpart K, Helicopter Offshore Operations (HOFO).
- (c) Objective: To ensure that VHM capability is subject to a design approval in accordance with CS 29.1465 when this is to be used to show compliance with the operating requirement SPA.HOFO.155.

### 3.2. Whom this Certification Memorandum affects

This Certification Memorandum affects operators, TCHs and VHM STCHs of helicopter types which will conduct CAT operations offshore in a hostile environment, as defined by Annex V (Part-SPA) of Regulation (EU) No 965/2012 Subpart K, Helicopter Offshore Operations (HOFO), on and after 1 January 2019.

## 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](mailto:CM@easa.europa.eu).
2. For any question concerning the technical content of this EASA Certification Memorandum, please contact:

Name, First Name: MARTIN GOMEZ Rodrigo

Function: Transmission Expert

Phone: +49 (0)221 89990 4158

E-mail: [rodrigo.martin-gomez@easa.europa.eu](mailto:rodrigo.martin-gomez@easa.europa.eu)

