

CS-29 AMENDMENT 4 — CHANGE INFORMATION

The Agency publishes amendments to Certification Specifications as consolidated documents. These documents are used for establishing the certification basis for applications made after the date of entry into force of the amendment.

Consequently, except for a note '[Amdt No: 29/4]' under the amended paragraph, the consolidated text of CS-29 does not allow readers to see the detailed changes introduced by the new amendment. To allow readers to also see these detailed changes, this document has been created. The same format as for publication of Notices of Proposed Amendments (NPAs) has been used to show the changes:

- deleted text is ~~struck through~~;
- new or amended text is highlighted in grey;
- an ellipsis '[...]' indicates that the rest of the text is unchanged.

BOOK 1 — CERTIFICATION SPECIFICATIONS

SUBPART A – GENERAL

1. Amend CS 29.1

CS 29.1 Applicability

(a) ~~This~~ ~~These~~ ~~Airworthiness Code~~ certification specifications ~~is~~ ~~are~~ applicable to large rotorcraft.

(...)

SUBPART D — DESIGN AND CONSTRUCTION

2. Amend CS 29.610

CS 29.610 Lightning and static electricity protection

(...)

(d) The electrical bonding and protection against lightning and static electricity must:

(...)

(4) Reduce to an acceptable level the effects of ~~lightning and~~ static electricity on the functioning of essential electrical and electronic equipment.

(...)

SUBPART F — EQUIPMENT

3. Amend CS 29.1309

CS 29.1309 Equipment, systems, and installations

(...)

~~(d) In showing compliance with subparagraph (a), (b), or (c), the effects of lightning strikes on the rotorcraft must be considered.~~

(...)

4. Create CS 29.1316

CS 29.1316 Electrical and electronic system lightning protection

(a) Each electrical and electronic system that performs a function whose failure would prevent the continued safe flight and landing of the rotorcraft, must be designed and installed in a way that:

(1) the function is not adversely affected during and after the time the rotorcraft's exposure to lightning; and

(2) the system automatically recovers normal operation of that function, in a timely manner, after the rotorcraft's exposure to lightning, unless the system's recovery

conflicts with other operational or functional requirements of the system that would prevent continued safe flight and landing of the rotorcraft.

- (b) For rotorcraft approved for instrument flight rules operation, each electrical and electronic system that performs a function whose failure would reduce the capability of the rotorcraft or the ability of the flight crew to respond to an adverse operating condition, must be designed and installed in a way that the function recovers normal operation in a timely manner after the rotorcraft's exposure to lightning.

5. Create CS 29.1317

CS 29.1317 High-Intensity Radiated Fields (HIRF) protection

- (a) Each electrical and electronic system that performs a function whose failure would prevent the continued safe flight and landing of the rotorcraft, must be designed and installed in a way that:

- (1) the function is not adversely affected during and after the time the rotorcraft's exposure to HIRF environment I as described in Appendix E;
- (2) the system automatically recovers normal operation of that function, in a timely manner after the rotorcraft's exposure to a HIRF environment I as described in Appendix E unless the system's recovery conflicts with other operational or functional requirements of the system that would prevent continued safe flight and landing of the rotorcraft;
- (3) the system is not adversely affected during and after the time the rotorcraft's exposure to a HIRF environment II as described in Appendix E; and
- (4) each function required during operation under visual flight rules is not adversely affected during and after the time the rotorcraft's exposure to a HIRF environment III as described in Appendix E.

- (b) Each electrical and electronic system that performs a function whose failure would significantly reduce the capability of the rotorcraft or the ability of the flight crew to respond to an adverse operating condition must be designed and installed in a way that the system is not adversely affected when the equipment providing the function is exposed to equipment HIRF test level 1 or 2, as described in Appendix E.

- (c) Each electrical and electronic system that performs a function whose failure would reduce the capability of the rotorcraft or the ability of the flight crew to respond to an adverse operating condition must be designed and installed in a way that the system is not adversely affected when the equipment providing the function is exposed to equipment HIRF test level 3, as described in Appendix E.

SUBPART G — OPERATING LIMITATIONS AND INFORMATION

6. Amend CS 29.1501

CS 29.1501 General

- (a) Each operating limitation specified in CS 29.1503 to 29.1525 and other limitations and information necessary for safe operation must be established.
- (b) The operating limitations and other information necessary for safe operation must be made available to the crew members and/or to the operator as appropriate, as prescribed in CS 29.1541 to ~~29.1589~~29.1593.

7. Create CS 29.1593

CS 29.1593 Exposure to volcanic cloud hazards

If required by an operating rule, the susceptibility of rotorcraft features to the effects of volcanic cloud hazards must be established.

APPENDIX E

8. Create CS-29 Appendix E

Appendix E — HIRF Environments and Equipment HIRF Test Levels

This Appendix specifies the HIRF environments and equipment HIRF test levels for electrical and electronic systems under CS 29.1317. The field strength values for the HIRF environments and equipment HIRF test levels are expressed in root-mean-square units measured during the peak of the modulation cycle.

- (a) HIRF environment I is specified in the following table:

Table I — HIRF Environment I

FREQUENCY	FIELD STRENGTH (V/m)	
	PEAK	AVERAGE
10 kHz–2 MHz	50	50
2–30 MHz	100	100
30–100 MHz	50	50
100–400 MHz	100	100
400–700 MHz	700	50
700 MHz–1 GHz	700	100
1–2 GHz	2000	200
2–6 GHz	3000	200
6–8 GHz	1000	200
8–12 GHz	3000	300
12–18 GHz	2000	200
18–40 GHz	600	200

In this table, the higher field strength applies to the frequency band edges.

(b) HIRF environment II is specified in the following table:

Table II — HIRF Environment II

FREQUENCY	FIELD STRENGTH (V/m)	
	PEAK	AVERAGE
10–500 kHz	20	20
500 kHz–2 MHz	30	30
2–30 MHz	100	100
30–100 MHz	10	10
100–200 MHz	30	10
200–400 MHz	10	10
400 MHz–1 GHz	700	40
1–2 GHz	1300	160
2–4 GHz	3000	120
4–6 GHz	3000	160
6–8 GHz	400	170
8–12 GHz	1230	230
12–18 GHz	730	190
18–40 GHz	600	150

In this table, the higher field strength applies to the frequency band edges.

(c) HIRF environment III is specified in the following table:

Table III — HIRF Environment III

FREQUENCY	FIELD STRENGTH (V/m)	
	PEAK	AVERAGE
10–100 kHz	150	150
100 kHz–400 MHz	200	200
400–700 MHz	730	200
700 MHz–1 GHz	1400	240
1–2 GHz	5000	250
2–4 GHz	6000	490
4–6 GHz	7200	400
6–8 GHz	1100	170
8–12 GHz	5000	330
12–18 GHz	2000	330
18–40 GHz	1000	420

In this table, the higher field strength applies at the frequency band edges.

(d) Equipment HIRF Test Level 1

- (1) From 10 kilohertz (kHz) to 400 megahertz (MHz), use conducted susceptibility tests with continuous wave (CW) and 1 kHz square wave modulation with 90 % depth or greater. The conducted susceptibility current must start at a minimum of 0.6 milliamperes (mA) at 10 kHz, increasing 20 decibels (dB) per frequency decade to a minimum of 30 mA at 500 kHz.
- (2) From 500 kHz to 40 MHz, the conducted susceptibility current must be at least 30 mA.
- (3) From 40 MHz to 400 MHz, use conducted susceptibility tests, starting at a minimum of 30 mA at 40 MHz, decreasing 20 dB per frequency decade to a minimum of 3 mA at 400 MHz.
- (4) From 100 MHz to 400 MHz, use radiated susceptibility tests at a minimum of 20 volts per meter (V/m) peak with CW and 1 kHz square wave modulation with 90 % depth or greater.
- (5) From 400 MHz to 8 gigahertz (GHz), use radiated susceptibility tests at a minimum of 150 V/m peak with pulse modulation of 4 % duty cycle with a 1 kHz pulse repetition frequency. This signal must be switched on and off at a rate of 1 Hz with a duty cycle of 50 %.

(e) Equipment HIRF Test Level 2. Equipment HIRF Test Level 2 is HIRF environment II in Table II of this Appendix reduced by acceptable aircraft transfer function and attenuation curves. Testing must cover the frequency band of 10 kHz to 8 GHz.

(f) Equipment HIRF Test Level 3

- (1) From 10 kHz to 400 MHz, use conducted susceptibility tests, starting at a minimum of 0.15 mA at 10 kHz, increasing 20 dB per frequency decade to a minimum of 7.5 mA at 500 kHz.
- (2) From 500 kHz to 40 MHz, use conducted susceptibility tests at a minimum of 7.5 mA.
- (3) From 40 MHz to 400 MHz, use conducted susceptibility tests, starting at a minimum of 7.5 mA at 40 MHz, decreasing 20 dB per frequency decade to a minimum of 0.75 mA at 400 MHz.
- (4) From 100 MHz to 8 GHz, use radiated susceptibility tests at a minimum of 5 V/m.

BOOK 2 — ACCEPTABLE MEANS OF COMPLIANCE

9. Amend AMC 29 General

AMC 29 General

- (a) The AMC to CS-29 consists of FAA AC 29-2C Change 2 dated 25 April 2006 AC 29-2C — Change 4, dated 1 May 2014, with the changes/additions given in this Book 2 of CS-29.
- (b) The primary reference for each of these AMCs is the CS-29 paragraph. Where there is an appropriate paragraph in FAA AC 29-2C — Change 4, dated 1 May 2014, AC 29-2C Change 2 dated 25 April 2006 this is added as a secondary reference.

10. Create AMC No 1 to CS 29.351

AMC No 1 to CS 29.351

Yawing conditions

(a) Definitions

- (1) Suddenly. For the purpose of this AMC, 'suddenly' is defined as an interval not to exceed 0.2 seconds for a complete control input. A rational analysis may be used to substantiate an alternative value.
- (2) Initial Trim Condition. Steady, 1G, level flight condition with zero bank angle or zero sideslip.
- (3) 'Line'. The rotorcraft's sideslip envelope, defined by the rule, between 90° at $0.6V_{NE}$ and 15° at V_{NE} or V_H whichever is less (see Figure 1).
- (4) Resulting Sideslip Angle. The rotorcraft's stabilised sideslip angle that results from a sustained maximum cockpit directional control deflection or as limited by pilot effort in the initial level flight power conditions.

- (b) Explanation. The rule requires a rotorcraft's 'structural' yaw or sideslip design envelope that must cover a minimum forward speed or hover to V_{NE} or V_H whichever is less. The scope of the rule is intended to cover structural components that are primarily designed for the critical combinations of tail rotor thrust, inertial and aerodynamic forces. This may include but is not limited to fuselage, tailboom and attachments, vertical control surfaces, tail rotor and tail rotor support structure.

- (1) The rotorcraft's structure must be designed to withstand the loads in the specified yawing conditions. The standard does not require a structural flight demonstration. It is a structural design standard.
- (2) The standard applies only to power-on conditions. Autorotation need not be considered.
- (3) This standard requires the maximum allowable rotor revolutions per minute (RPM) consistent with each flight condition for which certification is requested.
- (4) For the purpose of this AMC, the analysis may be performed in international standard atmosphere (ISA) sea level conditions.
- (5) Maximum displacement of the directional control, except as limited by pilot effort (29.397(a)), is required for the conditions cited in the rule. A control-system-limiting device may be used, however the probability of failure or malfunction of these

system(s) should be considered (See AMC No 2 to CS 29.351 Interaction of System and Structure).

- (6) Both right and left yaw conditions should be evaluated.
 - (7) The airloads on the vertical stabilisers may be assumed independent of the tail rotor thrust.
 - (8) Loads associated with sideslip angles exceeding the values of the 'line', defined in Figure 1, do not need to be considered. The corresponding points of the manoeuvre may be deleted.
- (c) Procedure. The design loads should be evaluated within the limits of Figure 1 or the maximum yaw capability of the rotorcraft, whichever is less; at speeds from zero to V_H or V_{NE} , whichever is less, for the following phases of the manoeuvre (see Note 1):
- (1) With the rotorcraft at an initial trim condition, the cockpit directional control is suddenly displaced to the maximum deflection limited by the control stops or by the maximum pilot force specified in 29.397(a). This is intended to generate a high tail rotor thrust.
 - (2) While maintaining maximum cockpit directional control deflection, within the limitation specified in (c)(1) of this AMC allow the rotorcraft to yaw to the maximum transient sideslip angle. This is intended to generate high aerodynamic loads that are determined based on the maximum transient sideslip angle or the value defined by the 'line' in Figure 1 whichever is less (see Note 1).
 - (3) Allow the rotorcraft to attain the resulting sideslip angle. In the event that the resulting sideslip angle is greater than the value defined by the 'line' in Figure 1, the rotorcraft should be trimmed to that value of the angle using less than maximum cockpit directional-control deflection by taking into consideration the manoeuvre's entry airspeed (see Note 2).
 - (4) With the rotorcraft yawed to the resulting sideslip angle specified in (c) (3) of this AMC the cockpit control is suddenly returned to its initial trim position. This is intended to combine a high tail rotor thrust and high aerodynamic restoring forces.

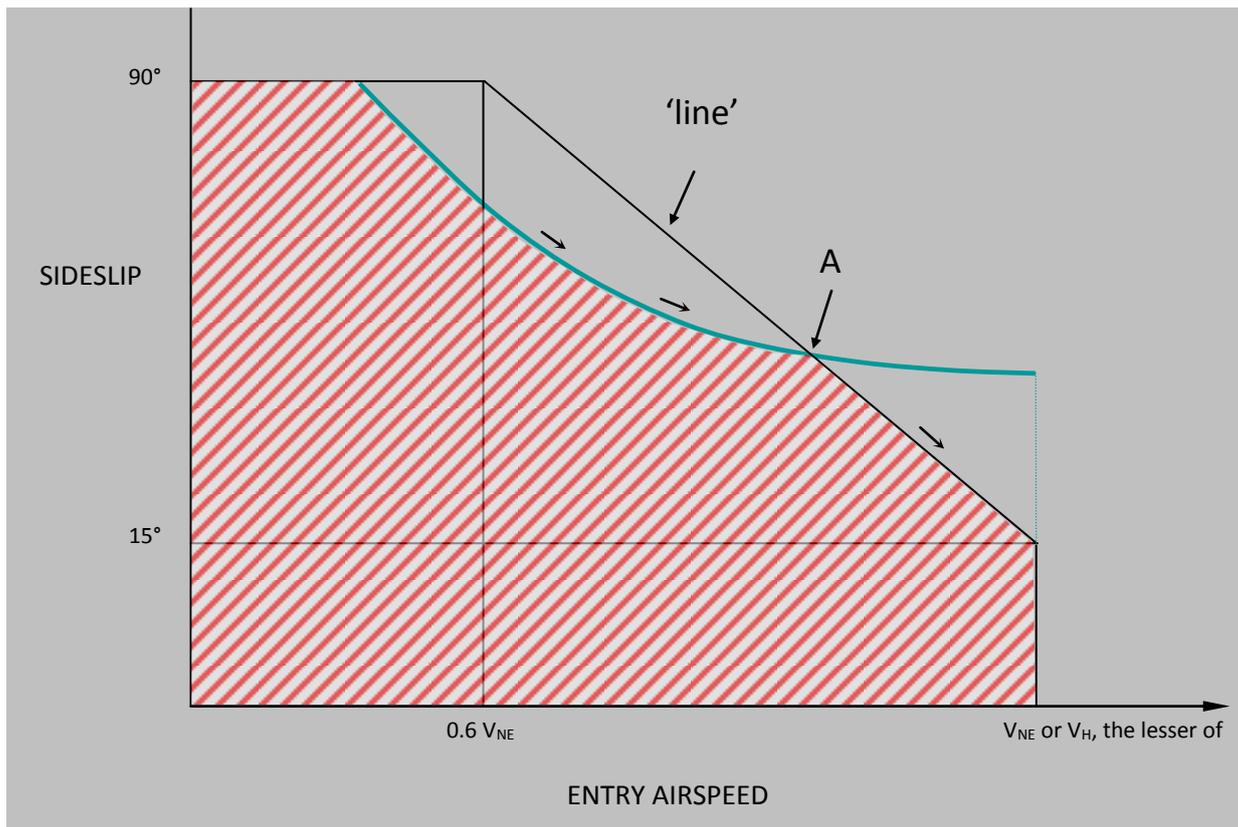


Figure 1 — YAW/FORWARD SPEED DIAGRAM

NOTE:

- (1) When comparing the rotorcraft's sideslip angle against the 'line' of Figure 1, the entry airspeed of the manoeuvre should be used.
- (2) When evaluating the yawing condition against the 'line' of Figure 1, sufficient points should be investigated in order to determine the critical design conditions. This investigation should include the loads that result from the manoeuvre, specifically initiated at the intermediate airspeed which is coincident with the intersection of the 'line' and the resultant sideslip angle (point A in Figure 1).
- (d) Another method of compliance may be used with a rational analysis (dynamic simulation), acceptable to the Agency/Authority, performed up to V_H or V_{NE} whichever is less, to the maximum yaw capability of the rotorcraft with recovery initiated at the resulting sideslip angle at its associated airspeed. Loads should be considered for all portions of the manoeuvre.

11. Rename AMC 29.351 as AMC No 2 to CS 29.351 and amend it

AMC No 2 to CS 29.351

Yaw manoeuvre conditions

1. Introduction

This AMC provides further guidance and acceptable means of compliance to supplement FAA AC⁺ 29-2C Change 2 § AC 29.351b. § 29.351 (Amendment 29-40) YAWING CONDITIONS), to meet the Agency's interpretation of CS 29.351. As such it should be used in conjunction with the FAA AC but take precedence over it, where stipulated, in the showing of compliance.

Specifically, this AMC addresses two areas where the FAA AC has been deemed by the Agency as being unclear or at variance to the Agency's interpretation. These areas are as follows:

a. Aerodynamic Loads

The certification specification CS 29.351 provides a minimum safety standard for the design of rotorcraft structural components that are subjected in flight to critical loads combinations of anti-torque system thrust (e.g. tail rotor), inertia and aerodynamics. A typical example of these structural components is the tailboom.

However, compliance with this standard according to FAA AC 29-2C Change 2 may not necessarily be adequate for the design of rotorcraft structural components that are principally subjected in flight to significant aerodynamic loads (e.g. vertical empennage, fins, cowlings and doors).

For these components and their supporting structure, suitable design criteria should be developed by the Applicant and agreed with the Agency.

In lieu of acceptable design criteria developed by the applicant, a suitable combination of sideslip angle and airspeed for the design of rotorcraft components subjected to aerodynamic loads may be obtained from a simulation of the yaw manoeuvre of CS 29.351, starting from the initial directional control input specified in CS 29.351(b)(1) and (c)(1), until the rotorcraft reaches the maximum transient ~~overswing~~ sideslip angle (~~overswing~~) resulting from its motion around the yaw axis.

b. Interaction of System and Structure

Maximum displacement of the directional control, except as limited by pilot effort (CS 29.397(a)), is required for the conditions cited in the certification specification. In the load evaluation, credit may be taken for consideration of the effects of control system limiting devices.

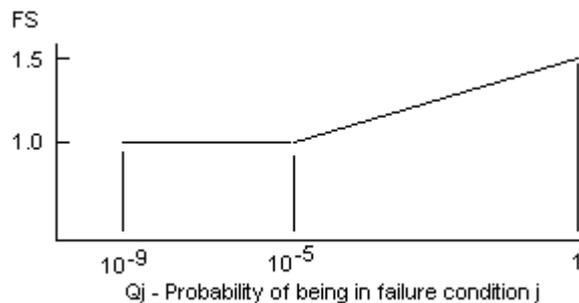
However, the probability of failure or malfunction of these system(s) should also be considered and if it is shown not to be extremely improbable, then further load conditions with the system in the failed state should be evaluated. This evaluation may include Flight Manual Limitations, if failure of the system is reliably indicated to the crew.

A yaw limiting device is a typical example of a system whose failed condition should be investigated in the assessment of the loads requested by CS 29.351.

⁺ Pending publication in FAA AC 29-2C, the text is reproduced here as AMC No. 1 to CS 29.351

An acceptable methodology to investigate the effects of all system failures not shown to be extremely improbable on the loading conditions of CS 29.351 is as follows:

- i) With the system in the failed state and considering any appropriate reconfiguration and flight limitations, it should be shown that the rotorcraft structure can withstand without failure the loading conditions of CS 29.351, when the manoeuvre is performed in accordance with the provisions of this AMC.
- ii) The factor of safety to apply to the above specified loading conditions to comply with CS 29.305 is defined in the figure below.



$$Q_j = (T_j)(P_j)$$

where:

T_j = Average flight time spent with a failed limiting system j (in hours)

P_j = Probability of occurrence of failure of control limiting system j (per hour)

Note: If P_j is greater than 1×10^{-3} per flight hour, then a 1.5 factor of safety should be applied to all limit load conditions evaluated for the system failure under consideration.

12. Create AMC 29.1583

AMC 29.1583

Operating Limitations

This AMC provides further guidance and acceptable means of compliance to supplement FAA AC 29-2C Change 4 (AC 29.1583 § 29.1583 (Amendment 29-24) OPERATING LIMITATIONS) which is the EASA acceptable means of compliance, as provided for in AMC 29 General. Specifically, this AMC addresses aspects where the FAA AC has been deemed by EASA as being at variance with the EASA's interpretation. These aspects are as follows and the remaining paragraphs of FAA AC 29-2C AC 29.1583 that are not referenced below are considered to be EASA acceptable means of compliance:

...

b. Procedures.

- (7) Kinds of operations are established under CS 29.1525. This section should contain the following preamble: 'This rotorcraft is certified in the Large Category (category B or category A and category B) and is eligible for the following kinds of

operations when the appropriate instruments and equipment required by the airworthiness and operating rules are installed and approved and are in an operable condition.' The following, and any other kinds of operations that are applicable, should be listed.

- (i) Day and night VFR.
- (ii) Approved to operate in known icing conditions.
- (iii) IFR.
- (iv) Category A vertical operations from ground level or elevated heliports.
- (v) Extended overwater operations (ditching).
- (vi) External load operation.

Each operating limitation must be clear, unambiguous, and consistent with any other applicable limitation or regulatory requirement.

...

13. Create AMC 29.1593

AMC 29.1593

Exposure to volcanic cloud hazards

The aim of CS 29.1593 is to support commercial and non-commercial operators operating complex motor-powered rotorcraft by identifying and assessing airworthiness hazards associated with operations in contaminated airspace. Providing such data to operators will enable those hazards to be properly managed as part of an established management system.

Acceptable means of establishing the susceptibility of rotorcraft features to the effects of volcanic clouds should include a combination of experience, studies, analysis, and/or testing of parts or sub-assemblies.

Information necessary for safe operation should be contained in the unapproved part of the flight manual or other appropriate manual, and should be readily usable by operators in preparing a safety risk assessment as part of their overall management system.

A volcanic cloud comprises volcanic ash together with gases and other chemicals. Although the primary hazard is volcanic ash itself, other elements of the volcanic cloud may also be undesirable to operate through, thus their effect on airworthiness should be assessed.

In determining the susceptibility of rotorcraft features to the effects of volcanic clouds as well as the necessary information to be provided to operators, the following points should be considered:

- (a) Identify the features of the rotorcraft that are susceptible to airworthiness effects of volcanic clouds. These may include but are not limited to the following:
 - (1) malfunction or failure of one or more engines, leading not only to reduction or complete loss of thrust but also to failures of electrical, pneumatic and hydraulic systems;
 - (2) blockage of pitot and static sensors, resulting in unreliable airspeed indications and erroneous warnings;

- (3) windscreen abrasion, resulting in windscreens rendered partially or completely opaque;
 - (4) fuel contamination;
 - (5) volcanic ash and/or toxic chemical contamination of cabin air-conditioning packs, possibly leading to loss of cabin pressurisation or noxious fumes in the cockpit and/or cabin;
 - (6) erosion, blockage or malfunction of external and internal rotorcraft components;
 - (7) volcanic cloud static discharge, leading to prolonged loss of communications; and
 - (8) reduced cooling efficiency of electronic components, leading to a wide range of rotorcraft system failures.
- (b) The nature and severity of effects.
- (c) Details of any device or system installed on the rotorcraft that can detect the presence of volcanic cloud hazards (e.g. volcanic ash (particulate) sensors or volcanic gas sensors)
- (d) The effect of volcanic ash on operations arriving to or departing from contaminated aerodromes.
- (e) The related pre-flight, in-flight and post-flight precautions to be taken by the operator including any necessary amendments to Aircraft Operating Manuals, Aircraft Maintenance Manuals, Master Minimum Equipment List/Dispatch Deviation or equivalents, required to support the operator. Pre-flight precautions should include clearly defined procedures for the removal of any volcanic ash detected on parked rotorcraft.
- (f) The recommended continuing-airworthiness inspections associated with operations in airspace contaminated by volcanic cloud(s) and arriving to or departing from aerodromes contaminated by volcanic ash; this may take the form of Instructions for Continued Airworthiness (ICA) or other advice.

14. Create AMC MG5

AMC MG5

Agricultural dispensing equipment installation

Certification procedures identified in MG5 refer specifically to the FAA regulatory system and are not fully applicable to the EASA regulatory system due to the different applicability of restricted certification. The EASA regulatory system does not encompass a restricted certification category for design changes or Supplemental Type Certificates.

The certification basis of design changes or Supplemental Type Certificates for agricultural dispensing is to be established in accordance with 21.A.101 of Annex I to Regulation (EU) No 748/2012, on a case-by-case basis through compliance with the applicable airworthiness requirements contained in MG5, supplemented by any special conditions in accordance with 21.A.16B of Regulation (EU) No 748/2012 that are appropriate to the application and specific operating limitations and conditions. If appropriate to the proposed design, compliance with

the above could be achieved through the provisions contained in 21A.103(a)2(ii) or 21A.115(b)2 of Regulation (EU) No 748/2012.

15. Create AMC MG6

AMC MG6

Emergency Medical Service (EMS) systems installations, including interior arrangements, equipment, Helicopter Terrain Awareness and Warning System (HTAWS), radio altimeter, and Flight Data Monitoring System (FDMS)

This AMC provides further guidance and acceptable means of compliance to supplement the FAA AC 29-2C Change 4 MG6 which is the EASA acceptable means of compliance, as provided for in AMC 29 General. Specifically, this AMC addresses aspects where the FAA AC has been deemed by EASA as being at variance with the EASA's interpretation or regulatory system. These aspects are as follows and the remaining paragraphs of FAA AC 29-2C MG6 that are not referenced below are considered to be EASA acceptable means of compliance:

a. Explanation. This AMC pertains to EMS configurations and associated rotorcraft airworthiness standards. EMS configurations are usually unique interior arrangements that are subject to the appropriate airworthiness standards (CS-29 or other applicable standards) to which the rotorcraft was certified. No relief from the standards is intended except through the procedures contained in Regulation (EU) No 748/2012 (namely Part-21 point 21.A.21(c)). EMS configurations are seldom, if ever, done by the original manufacturer.

- (1) Regulation (EU) No 965/2012 specifies the minimum equipment required to operate as a helicopter air ambulance service provider. This equipment, as well as all other equipment presented for evaluation and approval, is subject to compliance with airworthiness standards. Any equipment not essential to the safe operation of the rotorcraft may be approved provided the use, operation, and possible failure modes of the equipment are not hazardous to the rotorcraft Safe flight, safe landing, and prompt evacuation of the rotorcraft, in the event of a minor crash landing, for any reason, are the objectives of the EASA's evaluation of interiors and equipment unique to EMS.
 - i. For example, a rotorcraft equipped only for transportation of a non-ambulatory person (e.g. a police rotorcraft with one litter) as well as a rotorcraft equipped with multiple litters and complete life support systems and two or more attendants or medical personnel may be submitted for approval. These configurations will be evaluated to the airworthiness standards appropriate to the rotorcraft certification basis.
 - ii. Large category rotorcraft should comply with flight crew and passenger safety standards, which will result in the need to re-evaluate certain features of the baseline existing type certified rotorcraft related to the EMS arrangement, such as doors and emergency exits, and occupant protection. Compliance with

airworthiness standards results in the following features that should be retained as part of the rotorcraft's baseline type design: an emergency interior lighting system, placards or markings for doors and exits, exit size, exit quantity and location, exit access, safety belts and possibly shoulder harnesses or other restraint or passenger protection means. The features, placards, markings, and 'emergency' systems required as part of the rotorcraft's baseline type design should be retained unless specific replacements or alternate designs are necessary for the EMS configuration to comply with airworthiness standards.

(2) Many EMS configurations of large rotorcraft are typically equipped with the following:

- i. attendant and medical personnel seats, which may swivel;
- ii. multiple litters, some of which may tilt;
- iii. medical equipment stowage compartments;
- iv. life support and other complex medical equipment;
- v. human infant incubator ('isolette');
- vi. curtains or other interior light shielding for the flight crew compartment;
- vii. external loudspeakers and search lights;
- viii. special internal and external communication radio equipment;
- ix. FDMS;
- x. radio altimeter;
- xi. HTAWS.

(3) All helicopter air ambulance service providers are required to operate at all times in accordance with Regulation (EU) No 965/2012, which also defines the equipment required for an operational approval to be obtained.

b. Procedures

(2) Evacuation and interior arrangements

- iii. When an evacuation demonstration is determined to be appropriate for compliance, 90 seconds should be used as the time interval for evacuation of the rotorcraft. Attendants and flight crew, trained in the evacuation procedures, may be used to remove the litter patient(s). It is preferable for the patient(s) to remain in the litter; however, the patient(s) may be removed from the litter to facilitate rapid evacuation through the exit. The patient(s) is (are) not ambulatory during the demonstration. Evacuation procedures should be included if isolettes are part of the interior. The demonstration may be conducted in daylight with the dark of the night simulated and the rotorcraft in a normal attitude with the landing gear extended. For the purpose of the demonstration, exits on one side (critical side) should be used. Exits on the opposite side are blocked and not accessible for the demonstration.

(3) Restraint of occupants and equipment

The emergency landing conditions specified in CS 29.561(b) dictate the design load conditions. See FAA AC 29-2, sections 29.561 and 29.785, for further information.

- i. Whether seated or recumbent, the occupants must be protected from serious injury as prescribed in CS 29.785. Swivel seats and tilt litters may be used provided they are substantiated for the appropriate loads for the position selected for approval. Placards or markings may be used to ensure proper orientation for flight, take-off, or landing and emergency landing conditions. The seats and litters should be listed in the type design data for the configuration. See paragraph b.(17) for substitutions.

(6) Interior or 'medical' lights

The view of the flight crew must be free from glare and reflections that could cause interference. Curtains that meet flammability standards may be used. Complete partition or separation of the flight crew and passenger compartment is not prudent. Means for visual and verbal communication are usually necessary. Refer to FAA AC 29-2, section 29.773, which addresses pilot visibility aspects.