

CS-29 AMENDMENT 7 — CHANGE INFORMATION

EASA 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: 29/7]' 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:

- (a) deleted text is ~~struck through~~;
- (b) new or amended text is highlighted in **blue**;
- (c) an ellipsis '[...]' indicates that the remaining text is unchanged.

BOOK 1

SUBPART F — EQUIPMENT

CS 29.1457 Cockpit voice recorders

(See AMC 29.1457)

[...]

(d) Each cockpit voice recorder must be installed so that:

(1) (i) It receives its electrical power from the bus that provides the maximum reliability for operation of the cockpit voice recorder without jeopardising service to essential or emergency loads; and

(ii) It remains powered for as long as possible without jeopardising the emergency operation of the rotorcraft;

(2) There is an automatic means to simultaneously stop the recording recorder and prevent each erasure feature from functioning, within 10 minutes after crash impact; and

(3) There is an aural or visual means for pre-flight checking of the recorder for proper operation;

(4) Any single electrical failure that is external to the recorder does not disable both the cockpit voice recorder function and the flight data recorder function;

(5) There is a means for the flight crew to stop the cockpit voice recorder function upon completion of the flight in a way such that re-enabling the cockpit voice recorder function is only possible by dedicated manual action; and

(6) It has an alternate power source:

— that provides 10 minutes of electrical power to operate both the recorder and the cockpit-mounted area microphone; and

— to which the recorder and the cockpit-mounted area microphone are switched automatically in the event that all other power to the recorder is interrupted either by a normal shutdown or by any other loss of power.

(e) The record container of the recording medium must be located and mounted so as to minimise the probability of rupture of the container rupturing, the recording medium being destroyed, or the underwater locating device failing as a result of any possible combinations of:

— crash impact with the Earth's surface;

— and consequent the heat damage caused by to the record from a post-impact fire; and

— immersion in water.

- (f) If the cockpit voice recorder has a ~~bulk an~~ erasure device ~~or function~~, the installation must be designed to minimise the ~~probability~~ ~~probabilities~~ of inadvertent operation and ~~of~~ actuation of the ~~erasure~~ device ~~or function~~ during crash impact.
- (g) Each ~~The~~ recorder container ~~of the cockpit voice recorder~~ must:
- (1) ~~be either bright orange or bright yellow;~~
 - (2) have reflective tape affixed to its external surface to facilitate locating it; and
 - (3) have an underwater locating device on or adjacent to the container which is secured in such a manner that they are not likely to be separated during crash impact.

CS 29.1459 Flight data recorders

(See AMC 29.1459)

- (a) Each flight data recorder required by the applicable operating rules must be installed so that:
- [...]
- (3) (i) It receives its electrical power from the bus that provides the maximum reliability for operation of the flight recorder without jeopardising service to essential or emergency loads ; and
 - (ii) It remains powered for as long as possible without jeopardising the emergency operation of the rotorcraft;
 - (4) There is an aural or visual means for pre-flight checking of the recorder for proper recording of data in the storage medium; and
 - (5) Except for recorders powered solely by the engine-driven electrical generator system, there is an automatic means to ~~simultaneously stop a~~ ~~the recording~~ recorder ~~that has a data erasure feature and prevent each erasure feature from functioning~~, within 10 minutes after crash impact;
 - (6) If the cockpit voice recorder function is also performed by the recorder and no other recorder is installed on board the rotorcraft, any single electrical failure that is external to the recorder does not disable both the cockpit voice recorder function and the flight data recorder function; and
 - (7) If another recorder is installed on board the rotorcraft to perform the cockpit voice recorder function, any single electrical failure that is external to the recorder dedicated to the flight data recorder function does not disable both the recorders.
- (b) Each ~~non-ejectable~~ The container ~~of the recording medium~~ must be located and mounted so as to minimise the probability of ~~the container rupture~~ ~~rupturing~~, the recording medium being ~~destroyed~~, or the underwater locating device failing, ~~resulting~~ as a result of any possible combinations of:
- ~~from crash impact~~ with the Earth's surface;

- and subsequent ~~the heat~~ damage to the record from ~~caused by post-impact fire~~; and
 - ~~immersion in water~~.
- (c) A correlation must be established between the flight ~~data~~ recorder readings of airspeed, altitude, and heading and the corresponding readings (taking into account correction factors) of the first pilot's instruments.[...]
- (d) ~~Each recorder~~ ~~The container~~ of the flight data recorder must ~~comply with the specifications in CS 29.1457(g) that are applicable to the container of the cockpit voice recorder.~~:
- (1) ~~Be either bright orange or bright yellow;~~
 - (2) ~~Have a reflective tape affixed to its external surface to facilitate its location underwater;~~
~~and~~
 - (3) ~~Have an underwater locating device, when required by the applicable operating rules, on or adjacent to the container which is secured in such a manner that it is not likely to be separated during crash impact.~~

BOOK 2

AMC 29.1457

Cockpit Voice Recorders

This AMC provides further guidance and acceptable means of compliance to supplement FAA AC 29-2C § AC 29.1457. § 29.1457, to meet EASA's interpretation of CS 29.1457. As such, it should be used in conjunction with the FAA AC.

1. General

In showing compliance with CS 29.1457, the applicant should take into account EUROCAE Document No ED-112A 'MOPS for Crash-Protected Airborne Recorder Systems'.

2. Automatic means to stop the recording after a crash impact

The automatic means to stop the recording within 10 minutes after a crash impact may rely on:

- a. Dedicated crash impact detection sensors. In this case, negative acceleration sensors (also called 'g-switches') should not be used as the sole means of detecting a crash impact; or
- b. The recording start-and-stop logic, provided that this start-and-stop logic stops the recording 10 ± 1 minutes after the loss of power on all engines.

3. Means for the flight crew to stop the cockpit voice recorder

The means for the flight crew to stop the cockpit voice recorder function after the completion of the flight is needed in order to preserve the recording for the purpose of investigating accidents and serious incidents. In fulfilling this requirement, it is acceptable to use circuit breakers to remove the power to the equipment. Such a means to stop the cockpit voice recorder function is not in contradiction with FAA AC 29-2C, § AC 29.1357, § 29.1357, point b.(6), because it would not be used under normal operating conditions, but only after an accident or a serious incident has occurred.

4. Power sources

The alternate power source is a power source that is different from the source(s) that normally provides (provide) power to the cockpit voice recorder. In CS 29.1457(d)(6), a 'normal shutdown' of power to the recorder means a commanded interruption of the power supply from the normal cockpit voice recorder power bus; for example, after the termination of a normal flight. The following applies to the installation of an alternate power source:

- a. A tolerance of 1 minute on the 10 minutes minimum power requirement of CS 29.1457(d)(6) is acceptable;
- b. The use of helicopter batteries or other power sources is acceptable, provided that electrical power to the essential and critical loads is not compromised;
- c. If the alternate power source relies on dedicated stand-alone batteries (such as a recorder independent power supply), then these batteries should be located as close as practicable to the recorder;

- d. If the cockpit voice recorder function is combined with other recording functions within the same unit, the alternate power source may also power the other recording functions; and
- e. The means for performing a pre-flight check of the recorder for proper operation should include a check of the availability of the alternate power source.

5. Combination recorder

In cases where the recorder performs several recording functions, the means for pre-flight checking of the recorder for proper operation should indicate which recording functions (e.g. FDR, CVR, data-link recording, etc.) have failed.

AMC 29.1459

Flight Data Recorders

This AMC provides further guidance and acceptable means of compliance to supplement FAA AC 29-2C § AC 29.1459. § 29.1459, to meet EASA's interpretation of CS 29.1459. As such, it should be used in conjunction with the FAA AC.

1. General

In showing compliance with CS 29.1459, the applicant should take into account EUROCAE Document ED-112A 'MOPS for Crash-Protected Airborne Recorder Systems'.

2. Automatic means to stop the recording after a crash impact

Refer to the Section of AMC 29.1457 titled 'Automatic means to stop the recording after a crash impact'.

3. Combination recorder

Refer to the Section of AMC 29.1457 titled 'Combination recorder'.