

# ETSO-2C123c

ED Decision 2020/011/R (applicable from 25.7.2020)

## COCKPIT VOICE RECORDER SYSTEMS

### 1 Applicability

This ETSO provides the requirements that cockpit voice recorder (CVR) systems that are designed and manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking.

### 2 Procedures

#### 2.1 General

The applicable procedures are detailed in CS-ETSO, [Subpart A](#).

#### 2.2 Specific

All the information specified in EUROCAE ED-112A, Section 2-1, 2-1.3.4, excluding item 6, shall be documented in a manual and be made available to the accident investigation authorities on request. In addition, if special tools or recovery techniques are used to retrieve recorded information from any memory device that is used within the crash-protected memory module removed from a crash-damaged recorder, these tools/recovery techniques shall be also made available to the accident investigation authorities on request.

Note: Requests from accident investigation authorities can be independent of any ongoing investigation.

### 3 Technical Conditions

#### 3.1 Basic

##### 3.1.1 Minimum Performance Standard

The applicable standards are those provided in EUROCAE ED-112A, MOPS for Crash Protected Airborne Recorder Systems, dated September 2013, that pertain to the CVR type, except Chapters I-1 and I-6, and Sections 2-1.1, 2-1.5, 2-1.6, 2-1.11, 2-1.12, 2-3.1, 2-5, 3, Annex I-A, Annex I-C, and other ED-112A requirements related to installation, flight testing, aircraft maintenance as amended by Appendix 1 to this ETSO.

Table 1 lists CVR types and the ED-112A Section and Part containing the MPS for each type:

**Table 1 — CVR MPS Requirements**

CVR Type	ED-112A Reference
Single-function CVR in a <u>non-deployable</u> recorder	Section 2 and Part I.
CVR function in a <u>deployable</u> recorder	Section 2 (except for tests covered by ETSO-2C517) and Part I. The recorder shall also comply with ETSO-2C517.
CVR function in a <u>combined non-deployable</u> recorder	Section 2, Section 4, and Part I.

CVR function in a combined deployable recorder

Section 2 (except for tests covered by ETSO 2C517), Section 4 and Part I.  
The recorder shall also comply with ETSO-2C517.

Note: A CVR article may cover multiple types. A CVR may be a combined CVR and may also be deployable, in which case the applicable MOPS are Sections 2, 4, Part I and the MOPS of ETSO 2C517, following the table above.

### 3.1.2 Environmental Standard

See CS-ETSO, [Subpart A](#), paragraph 2.1.

### 3.1.3 Software

See CS-ETSO, [Subpart A](#), paragraph 2.2.

### 3.1.4 Airborne Electronic Hardware

See CS-ETSO, [Subpart A](#), paragraph 2.3.

## 3.2 Specific

### 3.2.1 Failure Condition Classification

See CS-ETSO, [Subpart A](#), paragraph 2.4.

A failure of the function defined in paragraph 3.1.1 of this ETSO is a minor failure condition.

A loss of the function defined in paragraph 3.1.1 of this ETSO is a minor failure condition.

The applicant must develop the system to be at least the development assurance level that is commensurate with these failure conditions.

Note: The failure classification requirement is driven by the use of CVRs in accident investigations.

## 4 Marking

### 4.1 General

See CS-ETSO, [Subpart A](#), paragraph 1.2.

### 4.2 Specific

#### 4.2.1 Lettering Identification

The equipment shall comply with the identification requirement in EUROCAE ED-112A, Section 2-1, paragraph 2-1.16.3, if it is fixed, and those of ETSO-2C517, if it is deployable.

## 5 Availability of Referenced Documents

See CS-ETSO, [Subpart A](#), paragraph 3.

[Amdt ETSO/6]

[Amdt ETSO/13]

[Amdt ETSO/16]

## Appendix 1 to ETSO-2C123c – MPS for Crash-Protected Airborne Recorder Systems

ED Decision 2020/011/R

The standard EUROCAE ED-112a, MOPS for Crash Protected Airborne Recorder Systems, dated September 2013, shall be modified as per Table 1 below.

**Table 1 — Modification of EUROCAE ED-112A**

Location	Initial ED-112A text	Amending text
2-1.16.2 a. iii.	Impact shock, shear and tensile test, penetration resistance, static crush, deep sea pressure and sea water immersion.	Impact shock, shear and tensile test, penetration resistance, static crush, deep sea pressure and sea water immersion. Deep sea pressure and sea water immersion may be performed on two different units provided that both units undergo the rest of the sequence and that the period of the deep sea pressure test is 90 days.
2-4.2.7 a.	<p>Unless it can be shown that the recording medium can withstand the conditions associated with deep sea immersion and that it is unlikely to be damaged as a consequence of collapse of any protective armour, immerse the recorder in sea water at a pressure of 60 MPa (equivalent to a depth of 6 000 m (20 000 ft) for a period of 30 days.</p> <p>This period may be reduced to 24 hours provided that the methods and materials used to protect the recording medium have been shown to be unaffected by sea water. To avoid damage to the test equipment, this test may be performed using any suitable liquid in the pressure chamber itself together with a means to separate this liquid from the sea water in which the recorder is immersed.</p>	<p>Unless it can be shown that the recording medium can withstand the conditions associated with deep-sea immersion and that it is unlikely to be damaged as a consequence of the collapse of any protective armour or except if the recorder is deployed during or following impact with water, immerse the recorder in seawater at a pressure of 60 MPa (equivalent to a depth of 6 000 m, i.e. 20 000 ft) for a period of 90 days.</p> <p>This period may be reduced to 24 hours provided that the test is performed once more after the sea water immersion test in 2-4.2.7 b. To avoid damage to the test equipment, this test may be performed using any suitable liquid in the pressure chamber itself together with a means to separate this liquid from the seawater in which the recorder is immersed.</p>
2-4.2.7 b.	Unless it can be shown that the recording medium and the identification required by paragraph 2-1.16.3 are resistant to the corrosive effects of sea water, immerse the recorder in sea water at a depth of 3 m and nominal temperature of + 25°C for a period of 30 days.	Unless it can be shown that the recording medium and the identification required by paragraph 2-1.16.3 are resistant to the corrosive effects of seawater, immerse the recorder in seawater at a depth of 3 m and a temperature of at least + 25.0 °C for a period of 90 days.

[Amdt ETSO/16]