



State Helicopter Flight Recorder Standards

1 Introduction

- 1.1 Helicopters conducting Public Transport operations in support of the UK police forces or the Maritime Coastguard Agency are regarded as conducting State activities and are not covered by Regulation (EC) No 216/2008 (the Basic Regulation). Therefore such aircraft must comply with the equipment requirements of the Air Navigation Order 2016 (ANO) (as amended), article 119 and Schedule 6. Scale SS of Schedule 6 requires that certain categories of helicopter be equipped with flight recorder systems of types approved by the Civil Aviation Authority (CAA) for the purposes of accident investigation.
- 1.2 Flight recorder systems installed in a helicopter in accordance with the ANO need to comply with published CAA Specifications (see References) or such other specification as the CAA may approve. Alternative specifications shall provide at least an equivalent standard of performance and crash survivability and meet with the particular requirements of the ANO.
- 1.3 Following the accident to police helicopter EC135, G-SPAO in 2013, the Air Accident Investigation Branch (AAIB) made several Safety Recommendations (SR) concerning the provisioning and installation of crashworthy flight recording equipment for helicopters conducting State Public Transport operations including the police and Search and Rescue (SAR). In response to this the CAA issued Safety Directive (SD) 2016/006 in December 2016 (as amended), which mandated revisions to the flight recorder (FR) requirements for such helicopter operations in the UK. This directive was replaced by SD 2018/002 in May 2018 and the requirements will be incorporated into the ANO in due course.
- 1.4 The main revision to the FR systems that are required to be installed, over the standing levels of equipment, is the introduction of **cockpit image recorders** meeting EUROCAE Minimum Operating Performance Specification (MOPS) ED-112A or ED-155 standards, or an equivalent standard acceptable to the CAA.
- 1.5 A specification note, to summarise the revised flight recorder requirements and to provide additional information that applicants/operators may need in meeting the revised equipment specifications, was originally circulated to operators of police and SAR helicopters. That specification note is now cancelled and replaced by this CAA Specification No 23.

2 Revised Flight Recorder Installation Requirements for State Aircraft

- 2.1 The ANO and SD requirements for FRs, which includes the new image recorder equipment, for helicopters engaged in State police and SAR operations are summarised in the following paragraphs. (Refer to explanation of terms at the end of the document).
- 2.2 Helicopters operating under a Police Air Operators Certificate with a MTOM greater than 2,730 kg but not more than 3,175 kg and first issued with an individual Certificate of Airworthiness before 1 January 2019:
 - a) For helicopters in this category without a previously installed FDR and/or CVR:
 - i. Install a CARS compliant with ED-155 or its equivalent; and



- ii. Install a Class C AIRS¹ compliant with ED-155 or its equivalent as an alternative means of meeting the ANO FDR requirement.
 - b) For helicopters in this category with a previously installed FDR and CVR in compliance with ANO 2016:
 - i. Install a Class A AIRS² compliant with ED-155 or its equivalent.
 - c) Compliance for both a) and b) will be required by 1 April 2020.
- 2.3 Helicopters operating under a Police Air Operators Certificate with a MTOM above 3,175 kg and first issued with an individual Certificate of Airworthiness before 1 January 2019:
- a) Install a Class A AIR³ compliant with ED-112A or its equivalent.
 - b) Compliance with a) will be required by the 1 April 2020.
- 2.4 Helicopters operating under a Police Air Operators Certificate with a MTOM greater than 2,730 kg but not more 3,175 kg and first issued with an individual Certificate of Airworthiness on or after 1 January 2019:
- a) Install an ADRS, CARS and Class A AIRS all compliant with ED-155 or its equivalent.
- 2.5 Helicopters operating under a Police Air Operators Certificate with a MTOM above 3,175 kg and first issued with an individual Certificate of Airworthiness on or after 1 January 2019:
- a) Install an FDR, CVR and Class A AIR all compliant with ED-112A or its equivalent.
- 2.6 State SAR helicopters, under contract with the MCA, with a MTOM above 3,175 kg and first issued with an individual Certificate of Airworthiness before 1 January 2019:
- a) Install a Class A AIR, compliant with ED-112A or its equivalent.
 - b) Compliance with a) will be required by the end 1 April 2020.
- 2.7 State SAR helicopters, under contract with the MCA, with a MTOM above 3175 kg and first issued with an individual Certificate of Airworthiness on or after 1 January 2019:
- a) Install a Class A AIR, compliant with ED-112A or its equivalent.
- 2.8 In all cases, the image recordings are required to be protected to prevent misuse in accordance with the SD and in a similar fashion to the protection afforded to CVR recordings.

3 Modification and Installation Means of Compliance

- 3.1 In addition to the certification requirements related to the installation of the flight recorder system(s) and equipment on a helicopter, the following additional equipment and aircraft level aspects shall be observed.

¹ Class C Airborne Image Recording System (AIRS) provides a means for recording flight data where it is not practical or prohibitively expensive to record on an FDR, or where an FDR is not required. Refer to ED-155 III-1.3.3.c.ii.

² Class A AIRS is used when it is required to capture data supplemental to conventional flight recorders. For example, to capture cockpit Human Factors issues, movements etc. Refer to ED-155 III-1.3.3.c.i.

³ Class A Airborne Image Recorder (AIR), refer to ED-112A Table III-3.1: Required Image Quality

3.1.1 Equipment Level Requirements

AIR (annotated Cockpit Image Recorder CIR in the ETSO):

The equipment shall comply with ETSO-C176a⁴ (Aircraft Cockpit Image Recorder Systems).

The failure condition classification as detailed in the ETSO paragraph 3.2.1 has been determined to be minor or major depending on whether the recorder type is a Single CIR, CIR function in a deployable recorder or CIR function in a combined recorder⁵.

CARS, ADRS and AIRS:

The equipment shall comply with ETSO-2C197 (Information Collection and Monitoring Systems).

The failure condition classification as detailed in the ETSO paragraph 3.1.1 has been determined to be minor.

3.1.2 Aircraft Level Requirements

AIR:

The FR system shall comply with following requirements in relation to Equipment Installation and Installed Performance as set out in ED-112A:

Chapter 2-5, Common Design Specification

Chapter 3-4, Deployable Recorders (if operationally selected)

Chapter 5-6, Recorder Independent Power Supply (RIPS) (if operationally selected)

Chapter III-6, for equipment installation and ground and flight test procedures

Annex III-A, Post Flight Evaluation of Recordings

Annex III-B, Maintenance Practices

CARS, ADRS and AIRS:

The FR system shall comply with following requirements in relation to Equipment Installation and Installed Performance as set out in ED-155:

Chapter 2-5, Common Design Specification

Chapter 3-5, Deployable Recorders (if operationally selected)

The following requirements specific to CARS:

Chapter I-2.1.7, Quality and Reliability of Recording

Chapter I-6 for equipment installation and ground and flight test procedures

Annex I-A Post Flight Evaluation of Recordings

Annex I-B Maintenance Practices

The following requirements specific to ADRS:

Chapter II-2.1.7, Data to Be Recorded

Chapter II-2.1.9, Quality and Reliability of Recording

Chapter II-2.1.12, Data Sampling, Recording and Retrieval Characteristics

⁴ ETSO-C176a has replaced C176 and relates directly to EUROCAE ED-112A MOPS

⁵ The failure classification is driven by the accident investigation need