AZƏRBAYCAN RESPUBLİKASININ
NƏQLİYYAT, RABİTƏ VƏ YÜKSƏK TEXNOLOGİYALAR NAZİRLİYİ
DÖVLƏT MÜLKİ AVİASİYA AGENTLİYİ

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№ 66

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"Azerbaijan Aviation Rules - Flight Recorders (Part I - Airplanes)" və "Azerbaijan Aviation Rules - Flight Recorders (Part II - Helicopters)" adlı sənədlərə düzəlişin qüvvəyə minməsi barədə

Beynəlxalq Mülki Aviasiya haqqında Konvensiyanın 06 saylı Əlavəsinə edilmiş 43 saylı dəyişikliyin tədbiqi məqsədilə "Azerbaijan Aviation Rules - Flight Recorders (Part I - Airplanes)" ("Azərbaycan Aviasiya Qaydaları - Uçuş yazma cihazı (Hissə I- Təyyarələr)) və "Azerbaijan Aviation Rules - Flight Recorders (Part II - Helicopters)" ("Azərbaycan Aviasiya Qaydaları - Uçuş yazma cihazı (Hissə II- Helikopterlər)) adlı sənədlərə 01 saylı düzəlişlər işlənib hazırlanmışdır..

Sözügedən sənədlərin tətbiqini təmin etmək məqsədilə "Azərbaycan Respublikasının Nəqliyyat, Rabitə və Yüksək Texnologiyalar Nazirliyi yanında Dövlət Mülki Aviasiya Agentliyi haqqında Əsasnamə"nin 5.6.6-cı yarımbəndini rəhbər tutaraq, **əmr edirəm:**

1. "Azerbaijan Aviation Rules - Flight Recorders (Part I - Airplanes)" sənədinin 4-cü nəşrinə 01 saylı düzəliş 19.02.2021-ci il tarixindən qüvvəyə minsin.
2. "Azerbaijan Aviation Rules - Flight Recorders (Part II - Helicopters)" sənədinin 2-ci nəşrinə 01 saylı düzəliş 19.02.2021-ci il tarixindən qüvvəyə minsin.n.
3. Sənədlərdə göstərilən tələblərə uyğun olaraq bütün zəruri prosedurların tətbiqi təmin edilsin.
4. Sənədlərin Dövlət Mülki Aviasiya Agentliyinin (DMAA) və "Mülki Aviasiyada Uçuşların Təhlükəsizliyi üzrə Dövlət Müfəttişliyi"nin aidiyyəti mütəxəssisləri tərəfindən öyrənilməsi və bütün zəruri prosedurların təmin olunması təşkil edilsin.
5. Sənədlər DMAA-nın rəsmi internet saytında yerləşdirilsin.
6. Əmr bütün şəxsi heyətə çatdırılsın.
7. Əmrin icrasına nəzarət direktorun müavini Hacıağa Əliyevə həvalə edilsin.

Direktor **Arif Məmmədov**

APPROVED
by SCAA Director Order
№ 66 dd. 10 December 2020

AZERBAIJAN AVIATION RULES – FLIGHT RECORDERS (PART II – HELICOPTERS)

COCKPIT VOICE RECORDERS, FLIGHT DATA RECORDERS, COMBINATION RECORDERS, DATALINK RECORDERS, AIRBORNE IMAGE RECORDERS, AIRBORNE IMAGE RECORDING SYSTEM AND AIRCRAFT DATA RECORDING SYSTEM

State Civil Aviation Agency of the Republic of Azerbaijan

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0.3. DISTRIBUTION CONTROL

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0.4. RECORD OF AMENDMENTS AND REVISIONS

Edition / Revision №	Date of issue/revision	Inserted by	Para/Page	Effective date
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Edition: - *Release of a document having incorporated all previous revisions until the current version. New edition of a document will not show revised text in blue color. Current edition of a document shown on each page in footer.*

Revision: - *A change made to a part of document, where it is reflected with blue text or accompanied with a vertical line on right side of a document. Basic information on revisions (number and date) given in the List of effective Pages and indicated in header of affected page and in context itself.*

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0.5. ABBREVIATION

A/C	Aircraft
AOC	Air Operator Certificate
CAA	Civil Aviation Authority
CVR	Cockpit Voice Recorder
FDR	Flight Data Recording
SCAA	State Civil Aviation Agency of the Republic of Azerbaijan

0.6. TERMS SHALL, SHOULD, MAY

The following terms shall have the meaning outlined below:

“Shall” - An action verb in the imperative sense means that the application of a rule or procedure or provision is mandatory.

“Should” - Means that the application of a procedure or provision is recommended.

“May” - Means that the application of a procedure or provision is optional.

0.7. ADMINISTRATION AND CONTROL

This document is published as a book on A4-sized sheets. The PDF files will be locked and signed to prevent changes.

This document is regularly revised and amended. All personnel must be familiarized with all revisions done.

This document will be Amended and Revised in accordance with requirements of “Documentation and Control” procedure

SUBJECT: COCKPIT VOICE RECORDERS, FLIGHT DATA RECORDERS, COMBINATION RECORDERS, DATALINK RECORDERS, AIRBORNE IMAGE RECORDERS, AIRBORNE IMAGE RECORDING SYSTEM AND AIRCRAFT DATA RECORDING SYSTEM INSTALLED ON THE HELICOPTERS

A. PURPOSE:

These Azerbaijan Aviation Rules lays down the requirements for fitment of Cockpit Voice Recorders, Flight Data Recorders, and Combination Recorders, Data link Recorders, Airborne Image Recorders, Airborne Image Recording System and Aircraft Data Recording System on helicopters registered in Azerbaijan. All helicopters imported/ purchased or leased for operation in Azerbaijan shall meet the applicability requirements laid down in this AAR.

B. DEFINITIONS:

Flight Recorder: Any type of recorder installed in the aircraft for the purpose of complementing accident / incident investigation.

Commercial Operation: An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

C. FLIGHT RECORDER COMPOSITION:

Note 1: *Crash-protected flight recorders comprise one or more of the following:*

- a flight data recorder (FDR);
- a cockpit voice recorder (CVR);
- an airborne image recorder (AIR);
- a data link recorder (DLR);

As per Appendix 1.image and data link information may be recorded on either the CVR or the FDR.

Note 2: *Combination recorders (FDR/CVR) may be used to meet the flight recorder equipage requirements in this Regulation.*

Note 3: *Detailed requirements on flight recorders are contained in Appendix 1.*

Note 4: *Lightweight flight recorders comprise one or more of the following:*

- *an aircraft data recording system (ADRS);*
- *a cockpit audio recording system (CARS);*
- *an airborne image recording system (AIRS);*
- *a data link recording system (DLRS).*

As per Appendix 1, image and data link information may be recorded on either the CARS or the ADRS.

Note 5: *For helicopters for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.*

Note 6: *For helicopters for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

Note 7: *Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

1. FLIGHT DATA RECORDERS AND AIRCRAFT DATA RECORDING SYSTEMS

Note 1: *Parameters to be recorded are listed in Tables A1-1 and A1-3 of Appendix 1.*

1.1. APPLICABILITY

1.1.1. All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2016 shall be equipped with an FDR which shall record at least the first 48 parameters listed in Table A1-1 of Appendix 1.

1.1.2. All helicopters of a maximum certificated take-off mass of over 7 000 kg, or having a passenger seating configuration of more than nineteen, for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with an FDR which shall record at least the first 30 parameters listed in Table A1-1 of Appendix 1.

1.1.3. All turbine-engine helicopters of a maximum certificated take-off mass of over 2 250 kg, up to and including 3 175 kg for which the application for type certification was submitted to a Contracting State on or after 1 January 2018 shall be equipped with:

(a) an FDR which shall record at least the first 48 parameters listed in Table A1-1 of Appendix 1; or

(b) a Class C AIR or AIRS which shall record at least the flight path and speed parameters displayed to the pilot(s), as defined in Appendix 1, Table A1-3; or

(c) an ADRS which shall record the first 7 parameters listed in Table A1-3 of Appendix 4.

Note 1: *"The application for type certification is submitted to a Contracting State" refers to the date of application of the original "Type Certificate" for the helicopter type, not the date of certification of particular helicopter variants or derivative models.*

1.1.4. All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the application for type certificate is submitted to a Contracting State on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the first 53 parameters listed in Table A1-1 of Appendix 1.

1.2. RECORDING TECHNOLOGY

FDRs, ADRS, AIRs or AIRS shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

1.3. DURATION

All FDRs shall retain the information recorded during at least the last 10 hours of their operation.

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2. COCKPIT VOICE RECORDERS AND COCKPIT AUDIO RECORDING SYSTEM

2.1. APPLICABILITY

2.1.1. All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

2.2. DISCONTINUATION RECORDING TECHNOLOGY

CVRs and CARS shall not use magnetic tape or wire.

2.3. DURATION

All helicopters required to be equipped with a CVR, shall be equipped with a CVR which shall retain the information recorded during at least the last two hours of its operation.

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3. DATA LINK RECORDERS

3.1. APPLICABILITY

3.1.1. All helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which use any of the data link communications applications referred to in 5.1.2 of Appendix 1 and are required to carry a CVR, shall record the data link communications messages on a crash-protected flight recorder.

3.1.2. All helicopters for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to install and use any of the data link communications applications referred to in 5.1.2 of Appendix 1 and are required to carry a CVR shall record the data link communications messages on a crash-protected flight recorder the data link communications equipment is compliant with a type design or aircraft modification first approved prior to 1 January 2016..

Note 1: *Refer to Table A1 in Attachment A for examples of data link communication recording requirements.*

Note 2: *A Class B AIR could be a means for recording data link communications applications messages to and from the helicopters where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.*

Note 3: *The "aircraft modifications" refer to modifications to install the data link communications equipment on the aircraft (e.g. structural, wiring).*

3.2. DURATION

The minimum recording duration shall be equal to the duration of the CVR.

3.3. CORRELATION

Data link recording shall be able to be correlated to the recorded cockpit audio.

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4. FLIGHT RECORDERS – GENERAL

4.1. CONSTRUCTION AND INSTALLATION

Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

4.2. OPERATION

4.2.1. Flight recorders shall not be switched off during flight time.

4.2.2. To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined in accordance with AAR-OPS 3.

Note 1: *The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.*

Note 2: *The operator's responsibilities regarding the retention of flight recorder records are contained in AAR – OPS 3.*

4.3. CONTINUED SERVICEABILITY

4.3.1. Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

Note: *Procedures for the inspections of the flight recorder systems are given in Appendix 1.*

4.4. FLIGHT RECORDER ELECTRONIC DOCUMENTATION

Recommendation: *The documentation requirement concerning FDR parameters provided by operators to accident investigation authorities should be in electronic format and take account of industry specifications.*

Note: *Industry specification for documentation concerning flight recorder parameters may be found in the ARINC 647A, Flight Recorder Electronic Documentation, or equivalent document.*

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APPENDIX 1: FLIGHT RECORDERS

The material in this Appendix concerns flight recorders intended for installation in helicopters engaged in international air navigation.

Crash-protected flight recorders comprise one or more of the following:

- a flight data recorder (FDR);
- a cockpit voice recorder (CVR);
- an airborne image recorder (AIR);
- a data link recorder (DLR).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

Lightweight flight recorders comprise one or more of the following:

- an aircraft data recording system (ADRS),
- a cockpit audio recording system (CARS),
- an airborne image recording system (AIRS),
- a data link recording system (DLRS).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CARS or the ADRS.

1. General Requirements

1.1 Non-deployable flight recorder containers shall be painted a distinctive orange or yellow color.

1.2 Non-deployable crash-protected flight recorder containers shall:

(a) carry reflective material to facilitate their location; and

(b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz. At the earliest practicable date, but not later than 1 January 2018, this device shall operate for a minimum of 90 days.

1.3 Automatic deployable flight recorder containers shall:

(a) be painted a distinctive orange colour, however the surface visible from outside the helicopter may be of another colour;

(b) carry reflective material to facilitate their location; and

(c) have an integrated automatically activated ELT.

1.4 The flight recorder systems shall be installed so that:

(a) the probability of damage to the recordings is minimized;

(b) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and

(c) if the flight recorder systems have a bulk erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact.

(d) helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

Note: *The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.*

1.5 The crash-protected flight recorders shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorders without jeopardizing service to essential or emergency loads.

1.6 The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.

1.7 The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

1.8 Means shall be provided for an accurate time correlation between the flight recorder systems functions.

1.9 The manufacturer shall provide the appropriate certificating authority with the following information in respect of the flight recording systems:

(a) manufacturer's operating instructions, equipment limitations and installation procedures;

(b) parameter origin or source and equations which relate counts to units of measurement; and

(c) manufacturer's test reports.

2. Flight Data Recorder (FDR) And Aircraft Data Recording System (ADRS)

2.1 Start and stop logic

The FDR or ADRS shall start to record prior to the helicopters moving under its own power and record continuously until the termination of the flight when the helicopters is no longer capable of moving under its own power.

2.2 Parameters to be recorded

2.2.1 The parameters that satisfy the requirements for FDRs, are listed in Table A1-1. The number of parameters to be recorded shall depend on helicopter complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of helicopter complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by helicopter systems or the flight crew to operate the helicopter. However, other parameters may be substituted with due regard to the helicopter type and the characteristics of the recording equipment.

2.2.2 The following parameters shall satisfy the requirements for flight path and speed:

- Pressure altitude
- Indicated airspeed
- Outside air temperature
- Heading
- Normal acceleration
- Lateral acceleration
- Longitudinal acceleration (body axis)
- Time or relative time count
- Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- Radio altitude*

2.2.3 If further FDR recording capacity is available, recording of the following additional information shall be considered:

(a) additional operational information from electronic displays, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS); and

(b) additional engine parameters (EPR, N1, fuel flow, etc.).

2.2.4 The parameters that satisfy the requirements for ADTS are the first 7 parameters listed in Table A1-1.

2.2.5 If further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table A1-3 shall be considered

2.3 Additional information

2.3.1 The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.

2.3.2 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator/owner. The documentation shall be sufficient to ensure that accident

investigation authorities have the necessary information to read out the data in engineering units.

2.4 Operation with not working FDR

2.4.1 It is allowed to operate aircraft with non-working FDR if:

2.4.1.1 Departure airdrome is not the station of the Operator and there is no opportunity or worthiness to fix it before flight; and

2.4.1.2 Aircraft performed not more than 8 consecutive flights out-side base airdrome with failed on-board recording system; and

2.4.1.3 Not more than 3 calendar days (72 hours) passed since the moment detection of recorder failure (only during international flights); and

2.4.1.4 On-board voice recorder, envisaged by requirements is in working condition, except for conditions, when it is coupled with on-board voice recorder, - then it is allowed to perform only non-commercial flights in accordance with conditions set forth in para. 2.4.1.1, 2.4.1.2 and 2.4.1.3.

3. Cockpit Voice Recorder (CVR) And Cockpit Audio Recording System (CARS)

3.1 Start and stop logic

The CVR or CARS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

3.2 Signals to be recorded

3.2.1 The CVR shall record simultaneously on four separate channels, or more, at least the following:

(a) voice communication transmitted from or received in the helicopters by radio;

(b) aural environment on the flight deck;

(c) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed;

(d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and

(e) voice communication of flight crew members using the passenger address system, if installed

3.2.2 The preferred CVR audio allocation should be as follows:

(a) pilot- in-command audio panel;

(b) co-pilot audio panel;

(c) additional flight crew positions and time reference; and

(e) cockpit area microphone.

3.2.3 The CARS shall record simultaneously on two separate channels, or more, at least the following:

(a) voice communication transmitted from or received in the helicopter by radio;

(b) aural environment on the flight deck; and

(c) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed.

3.2.4 The preferred CARS audio allocation should be as follows:

(a) voice communication; and

(b) aural environment on the flight deck.

3.3 Operation with not working voice recording system

3.3.1 It is allowed to perform flight with not operating voice recording system if:

3.3.1.1 Departure airdrome is not Operator's station airdrome and there is no possibility or worthiness to fix on-board voice recorder before flight; and

3.3.1.2 Aircraft performed not more than 8 consecutive flights outside of base airdrome with failed on-board voice recorder; and

3.3.1.3 Not more than 3 calendar days (72 hours) passed since detection of on-board voice recorder failed (only during international flights); and

3.3.1.4 On-board flight data registration system, envisaged by requirements is operating.

4. Airborne Image Recorder (AIR) and Airborne Image Recording System (AIRS)

4.1 Start and stop logic

The AIR or AIRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

4.2 Classes

4.2.1 A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1: *To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.*

Note 2: *There are no provisions for Class A AIR or AIRS in this document.*

4.2.2 A Class B AIR or AIRS captures data link message displays.

4.2.3 A Class C AIR or AIRS captures instruments and control panels.

Note: *It may be considered as 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.*

5. Data Link Recorder (DLR)

5.1 Applications to be recorded

5.1.1 Where the helicopter flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the helicopter) and downlinks (from the helicopter), shall be recorded on the helicopter. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall to be recorded.

Note: *Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.*

5.1.2 Messages applying to the applications listed below shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system:

6. Inspections of Flight Recorder Systems

6.1 Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

6.2 FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the appropriate regulatory authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the appropriate regulatory authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.

6.3 Recording inspections shall be carried out as follows:

(a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

(b) the FDR or ADRS recording from a compleate flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

(c) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

(d) an examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;

(e) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and

(f) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.

(g) an examination of the recorded messages on the DLR or DLRS shall be carried out by replay of the DLR or DLRS recording.

6.4 A flight recorder system shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

6.5 A report of the recording system inspection shall be made available to SCAA for surveillance purposes within 7 days after issue CRS on A/C with inspected the recording system.

6.6 Calibration of the FDR system:

(a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and

(b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every 2 (two) years

TABLE A 1-1. PARAMETER GUIDANCE FOR CRASH PROTECTED FLIGHT DATA RECORDERS

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
1.	Time (UTC when available, otherwise relative time count or GNSS time sync)		24 hours	4	±0.125% /h	1 second
2.	Pressure-altitude		–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft)	1	±30 m to ±200 m (±100 ft to ±700 ft)	1.5 m (5 ft)
3.	Indicated airspeed or calibrated airspeed		As the installed pilot display measuring system	1	±3%	1 kt
4.	Heading (primary flight crew reference)		360°	1	±2°	0.5°
5.	Normal acceleration		–3 g to +6 g	0.125	±0.09 g excluding a datum error of ±0.045 g	0.004 g
6.	Pitch attitude		±75° or 100% of usable range whichever is greater	0.5	±2°	0.5°

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
7.	Roll attitude		±180°	0.5	±2°	0.5°
8.	Radio transmission keying		On-off (one discrete)	1	—	—
9.	Power on each engine		Full range	1 (per engine)	±2%	0.1% of full range
10.	Main rotor: Main rotor speed Rotor brake		 50–130% Discrete	0.51	 ±2% —	0.3% of full range —
11.	Pilot Input and/or control surface position – primary controls (collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal)		Full range	0.5 (0.25 recommended)	±2° unless higher accuracy uniquely required	0.5% of operating range
12.	Hydraulics, each system (low pressure)		Discrete	1	—	—
13.	Outside air temperature		Sensor range	2	±2°C	0.3°C

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
14. *	Autopilot/auto throttle/AFCS mode and engagement status		A suitable combination of discretes	1	—	—
15. *	Stability augmentation system engagement		Discrete	1	—	—
16. *	Main gearbox oil pressure		As the installed	1	As the installed	6.895 kN/m^2 (1 psi)
17. *	Main gearbox oil temperature		As the installed	2	As the installed	1°C
18.	Yaw rate		±400°/second	0.25	±1.5% maximum range excluding datum error of ±5%	±2°/s
19. *	Sling load force		0 to 200% of certified load	0.5	±3% of maximum range	0.5% for maximum certified load
20.	Longitudinal acceleration		±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
21.	Lateral acceleration		±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
22. *	Radio altitude		–6 m to 750 m (–20 ft to 2 500 ft)	1	±0.6 m (±2 ft) or ±3% whichever is greater below 150m (50 ft) and ±5% above150 m (500 ft)	0.3 m (1 ft) below 150 m (500 ft), 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft)
23. *	Vertical beam deviation		Signal range	1	±3%	0.3% of full range
24. *	Horizontal beam deviation		Signal range	1	±3%	0.3% of full range
25.	Marker beacon passage		Discrete	1	—	—
26.	Warnings		Discrete(s)	1	—	—
27.	Each navigation receiver frequency selection		Sufficient to determine selected frequency	4	As installed	—
28. *	DME 1 and 2 distances		0–370 km (0–200 NM)	4	As installed	1 852 m (1 NM)
29. *	Navigation data (latitude/longitude, ground speed, drift angle, wind speed, wind direction)		As installed	2	As installed	As installed
30. *	Landing gear and gear selector position		Discrete	4	—	—

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
31. *	Engine exhaust gas temperature (T_4)		As installed	1	As installed	—
32. *	Turbine inlet temperature (TIT/ITT)		As installed	1	As installed	—
33. *	Fuel contents		As installed	4	As installed	—
34. *	Altitude rate		As installed	1	As installed	—
35. *	Ice detection		As installed	4	As installed	—
36. *	Helicopter health and usage monitor system		As installed	—	As installed	—
37.	Engine control modes		Discrete	1	—	—
38. *	Selected barometric setting (pilot and co-pilot)		As installed	64 (4 recommended)	As installed	0.1 mb (0.01 in Hg)
39. *	Selected altitude (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
40. *	Selected speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
41. *	Selected Mach (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
42. *	Selected vertical speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
43. *	Selected heading (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
44. *	Selected flight path (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
45. *	Selected decision height		As installed	4	As installed	Sufficient to determine crew selection
46. *	EFIS display format (pilot and co-pilot)		Discrete(s)	4	—	—
47. *	Multi-function/ engine/alerts display format		Discrete(s)	4	—	—
48. *	Event marker		Discrete	1	—	—

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
49. *	GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) and (operational status)	Application for Type certification is submitted to a Contracting State on or after 1 January 2023	Discrete(s)	1	As installed	
50. *	TCAS/ACAS (traffic alert and collision avoidance system) and (operational status)	Application for Type certification is submitted to a Contracting State on or after 1 January 2023	Discrete(s)	1	As installed	
51. *	Primary flight controls – pilot input forces	Application for Type certification is submitted to a Contracting State on or after 1 January 2023	Full range	0.125 (0.0625 recommended)	± 3% unless higher accuracy is uniquely required	0.5% of operating range

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
52. *	Computed centre of gravity	Application for Type certification is submitted to a Contracting State on or after 1 January 2023	As installed	64	As installed	1% of full range
53. *	Helicopter computed weight	Application for Type certification is submitted to a Contracting State on or after 1 January 2023	As installed	64	As installed	1% of full range

TABLE A 1-2. DESCRIPTION OF APPLICATIONS FOR DATA LINK RECORDERS

Item No.	Application type	Application description	Recording content
1	Data link initiation	This includes any applications used to log on to or initiate datalink service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM) respectively.	C
2	Controller/pilot communication	This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances	C
3	Addressed surveillance	This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	C
4	Flight information	This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services.	C
5	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the helicopter are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	M*

Item No.	Application type	Application description	Recording content
6	Aeronautical operational control data	This includes any application transmitting or receiving data used for aeronautical operational control purposes (per the ICAO definition of operational control).	M*

K

Key:

C: *Complete contents recorded.*

M: *Information that enables correlation to any associated records stored separately from the helicopters.*

****:*** *Applications to be recorded only as far as is practicable given the architecture of the system.*

TABLE A 1-3. PARAMETER GUIDANCE FOR AIRCRAFT DATA RECORDING SYSTEMS

No.	Parameter name	Minimum recording range	Maximum recording interval seconds in	Minimum recording accuracy	Minimum recording resolution	Remarks
1	Heading					
	a) Heading (Magnetic or True)	±180°	1	±2°	0.5°	*Heading is preferred, if not available, yaw rate shall be recorded
	b) Yaw rate	±300°/s	0.25	±1% + drift of 360°/h	2°/s	
2	Pitch					
	a) Pitch attitude	±90°	0.25	±2°	0.5°	*Pitch attitude is preferred, if not available, pitch rate shall be recorded
	b) Pitch rate	±300°/s	0.25	±1% + drift of 360°/h	2°/s	
3	Roll					
	a) Roll attitude	±180°	0.25	±2°	0.5°	* Roll attitude is preferred, if not available, roll rate shall be recorded
	b) Roll rate	±300°/s	0.25	±1% + drift of 360°/h	2°/s	

No.	Parameter name	Minimum recording range	Maximum recording interval seconds in	Minimum recording accuracy	Minimum recording resolution	Remarks
4	Positioning system					
	a) Time	24 hours	1	±0.5°	0.1°	UTC time preferred where available
	b) Latitude/ longitude	Latitude:±90° Longitude: ±180°	2 (1 if available)	As installed (0.00015° recommended)	0.00005°	
	c) Altitude	–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1500 m (5 000 ft)	2 (1 if available)	As installed (±15m/±50ft) recommended)	1.5 m (5 ft)	
	d) Ground speed	0 – 1000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
	e) Track	0-360º	2 (1 if available)	As installed (±2° recommended)	0.5º	
	f) Estimated error	Available range	2 (1 if available)	As installed	As installed	Shall be recorded if readily available
5	Normal acceleration	–3 g to + 6 g	0.25 (0.125 if available)	As installed (±0.09 g excluding a datum error of ±0.05 g recommended)	0.004 g	
6	Longitudinal acceleration	±1 g	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	

No.	Parameter name	Minimum recording range	Maximum recording interval seconds in	Minimum recording accuracy	Minimum recording resolution	Remarks
7	Lateral acceleration	±1 g	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
8	External static pressure (or pressure altitude)	34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range	1	As installed (±1 hPa (0.3 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended)	0.1 hPa (0.01 in-Hg) or 1.5 m (5 ft)	
9	Outside air Temperature (or Total air temperature)	–50° to +90°C or available sensor range	2	As installed (±2°C recommended)	1°C	
10	Indicated air speed	As the installed pilot display measuring system or available sensor range	1	As installed (±3% recommended)	1 kt (0.5 kt recommended)	
11	Main rotor speed (Nr)	50% to 130% or available sensor range	0.5	As installed	0.3% of full range	
12	Engine RPM (*)	Full range including overspeed condition	Each engine each second	As installed	0.2% of full range	*For piston-engined helicopters

No.	Parameter name	Minimum recording range	Maximum recording interval seconds in	Minimum recording accuracy	Minimum recording resolution	Remarks
13	Engine oil pressure	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
14	Engine oil temperature	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
15	Fuel flow or pressure	Full range	Each engine each second	As installed	2% of full range	
16	Manifold pressure (*)	Full range	Each engine each second	As installed	0.2% of full range	*For piston-engined helicopters
17	Engine thrust / power / torque parameters required to determine propulsive thrust / power*	Full range	Each engine each second	As installed	0.1% of full range	* Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power. A margin for possible overspeed should be provided. Only for turbine- engined helicopters.

No.	Parameter name	Minimum recording range	Maximum recording interval seconds in	Minimum recording accuracy	Minimum recording resolution	Remarks
18	Engine gas generator speed (Ng) (*)	0-150%	Each engine each second	As installed	0.2% of full range	*Only for turbine-engined helicopters
19	Free power turbine speed (Nf) (*)	0-150%	Each engine each second	As installed	0.2% of full range	*Only for turbine-engined helicopters
20	Collective pitch	Full range	0.5	As installed	0.1% of full range	
21	Coolant temperature	Full range	1	As installed (±5°C recommended)	1°C	*Only for piston-engined helicopters
22	Main voltage	Full range	Each engine each second	As installed	1 Volt	
23	Cylinder head temperature(*)	Full range	Each cylinder each second	As installed	2% of full range	*Only for piston-engined helicopters
24	Fuel quantity	Full range	4	As installed	1% of full range	
25	Exhaust gas temperature	Full range	Each engine each second	As installed	2% of full range	
26	Emergency voltage	Full range	Each engine each second	As installed	1 Volt	

No.	Parameter name	Minimum recording range	Maximum recording interval seconds in	Minimum recording accuracy	Minimum recording resolution	Remarks
27	Trim surface position	Full range or each discrete position	1	As installed	0.3% of full range	
28	Landing gear position	Each discrete position*	Each gear every two seconds	As installed		* Where available, record up-and-locked and down-and- locked position
29	Novel/unique aircraft features	As required	As required	As required	As required	

ATTACHMENT H. GUIDE TO CURRENT FLIGHT RECORDER PROVISIONS

Supplementary to Chapter 3

Table A1. Data link communications (DLC) recording installation clarification

Rows	Date individual certificate of airworthiness was first issued	Date aircraft type certificate issued or modification for DLC equipment first approved	Date of activation for use of DLC equipment	DLC recording required	SARP Refe-rence
1	On or after 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	6.3.3.1.1
2	On or after 1 January 2016	Before 1 January 2016	On or after 1 January 2016	Yes	6.3.3.1.1
3	Before 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	6.3.3.1.2
4	Before 1 January 2016	Before 1 January 2016	Before 1 January 2016	No	6.3.3.1.2
5	Before 1 January 2016	Before 1 January 2016	On or after 1 January 2016	No*	6.3.3.1.2 6.3.3.1.3

*Not required but recommended

1. TABLE HEADINGS

1.1 Date individual certificate of airworthiness was first issued is self-explanatory.

1.2 Date aircraft type certificate issued or modification for DLC equipment first approved is the date that allows the installation of DLC equipment on the aircraft and refers to the airworthiness approval of the installation of aircraft components such as the structural and wiring provisions with which the DLC equipment needs to be compliant. These airworthiness approvals are usually in a form of a type certificate, a supplementary type certificate or an amended type certificate.

1.2.1 It is not uncommon for original customers of a helicopter that have airworthiness approvals related to DLC capability, to choose not to install the DLC equipment or choose not to have it activated even if the helicopter is prepared for it.

1.3 Date of activation for use of DLC equipment refers to the date that a DLC application referred to in 5.1.2 of Appendix 4 was first activated for use.

1.3.1 Datalink communication (DLC) equipment as used in these provisions, refer to the physical unit(s) (e.g. box(es)) that was approved to a minimum performance standard issued by a certification authority (e.g. TSO or ETSO).

1.3.2 The activation of DLC functions refer to approved software activation of DLC functions or software updates.

1.4 DLC recording required refers to the requirement to record DLC message in accordance with provisions 3.1.1, and 3.1.2.

2. GENERAL

2.1 It is the date on which the CVR capabilities of the aircraft were approved that determines the DLC recording requirement. The date in which the DLC equipment was approved to a minimum performance standard is not relevant for CVR recording requirement purposes.

2.2 For the DLC equipment to be compliant with an airworthiness approval, it needs to be able to use, without modification, the installed helicopter components that are necessary to provide the DLC function such as the:

a) datalink router (e.g. hosted in the communications management unit);

b) radios (e.g. VHF, HF datalink, Satcom) and related antennas.

2.3 Approved software updates to installed equipment or software activation of functions normally do not alter the DLC equipment compliance with the rest of the helicopter systems.

3. EXAMPLES

3.1 For rows 1 and 2:

– The recording requirement is driven by Standards 3.1.1 which is based on when the individual certificate of airworthiness was first issued. Any subsequent airworthiness modifications related to DLC capability do not exempt the helicopter from the requirement to record DLC messages.

3.2 For rows 3 to 5 — General:

– The recording requirement is driven by Standards 3.1.2 and is based on whether or not the helicopter has an airworthiness approval for DLC capabilities and the date of its issue.

– Since there was no requirement to record DLC messages prior to 1 January 2016, airworthiness approvals related to DLC capability issued before that date did not necessarily include this function.

3.3 For row 3:

– The recording requirement applies regardless of when the certificate of airworthiness was issued, because an airworthiness approval related to DLC capability was issued on or after 1 January 2016. The date of installation of the equipment would typically be after the airworthiness approval.

3.4 For row 4:

– The recording requirement does not apply because the helicopter's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The date of installation of DLC equipment is not a factor for DLC message recording requirements as long as the equipment is compliant with that airworthiness approval.

3.5 For row 5:

– The recording requirement does not apply because the helicopter's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The date of installation of DLC equipment is not a factor for DLC message recording requirements as long as the equipment is compliant with that airworthiness approval.

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