



International
Civil Aviation
Organization

Organisation
de l'aviation civile
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Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Tel.: +1 514-954-8219 ext. 8080

Ref.: AN 11/6.3.30-18/13

29 March 2018

Subject: Adoption of Amendment 36 to Annex 6, Part II

Action required: a) Notify any disapproval before 16 July 2018; b) Notify any differences and compliance before 8 October 2018¹; c) Consider the use of the Electronic Filing of Differences (EFOD) System for notification of differences and compliance

Sir/Madam,

1. I have the honour to inform you that Amendment 36 to the *International Standards and Recommended Practices, Operation of Aircraft — International General Aviation — Aeroplanes* (Annex 6, Part II to the Convention on International Civil Aviation) was adopted by the Council at the fifth meeting of its 213th Session on 7 March 2018. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>) where you can access all other relevant documentation.

2. When adopting the amendment, the Council prescribed 16 July 2018 as the date on which it will become effective, except for any part concerning which a majority of Contracting States have registered their disapproval before that date. In addition, the Council resolved that Amendment 36, to the extent it becomes effective, will become applicable on 8 November 2018 unless otherwise indicated.

3. Amendment 36 arises from:

- a) recommendations stemming from the ninth meeting of the Flight Recorder Specific Working Group (FLIRECSWG/9) relating to cockpit voice recorder (CVR) and airborne image recorder (AIR) erase function, flight data recorder parameter lists and the simplification of flight recorder Standards and Recommended Practices (SARPs);

¹ 5 October 2020 for provisions indicating applicable as of 5 November 2020.

- b) recommendations stemming from the third and fourth meetings of the Airworthiness Panel (AIRP/3 and AIRP/4) concerning the approval and global recognition of approved maintenance organizations (AMOs) (Phases I and II) and the introduction of provisions linked to electronic aircraft maintenance records (EAMR) framework; and
- c) proposals developed by the thirteenth meeting of the Instrument Flight Procedure Panel (IFPP/13) to update references in Annex 6, Part II as a result of the restructuring of *Procedures for Air Navigation Services — Aircraft Operations*, Volume I — *Flight Procedures* (PANS-OPS, Doc 8168).

4. The amendment relating to CVR and AIR erase function, flight data recorder parameter lists and the simplification of flight recorder SARPs addresses the following issues:

- a) *CVR and AIR erase function*. The amendment strengthens the requirements for an erase function available to the crew to erase CVR and AIR recordings after flights. In the case of solid-state recorders, although such function erases the recordings, it would still be possible for the accident investigation authorities to access these recordings using special techniques.
- b) *Flight data recorder parameter lists*. The amendment aligns the lists in Annex 6, Parts I and II to the EUROCAE ED-112A specifications. A Standard for newly designed aircraft applying for type certificate as well as a Recommendation for newly manufactured aircraft obtaining a first certificate of airworthiness after 1 January 2023 provides manufacturers and operators ample time to take these provisions into account for new aircraft. In many cases, the parameters are available but have not been included in the flight data recorder (FDR) dataframe layout to be recorded. This implies a modification to the dataframe and the approvals associated with such a modification. Having these parameters available will also be advantageous to flight data monitoring systems. There is no retrofitting implication.
- a) *Simplification of flight recorder SARPs*. Due consideration was given to a performance-based approach for future development or revision of flight recorder provisions that would specify what recorded material needs to be available after an accident or incident, and allow for advancements in technology to provide a means of compliance. The flight recorder-related SARPs in Annex 6, Part II were simplified but without change to the intent of the provisions. During the simplification, the provisions were reformatted to facilitate their interpretation.

5. The amendment concerning approval and global recognition of AMOs and the introduction of provisions linked to the EAMR framework addresses the following issues:

- a) *Approval and global recognition of AMOs*. The amendment concerns provisions developed in two phases for the approval and global recognition of AMOs. These provisions will facilitate and enhance the promotion of the mutual recognition of AMOs and will ensure the clear allocation of responsibility for the approval of an AMO to the State of Registry.
- b) *Electronic aircraft maintenance records (EAMR)*. The amendment introduces provisions linked to the EAMR framework. Current ICAO provisions for aircraft

maintenance records do not specifically describe the format in which the records should be issued. The amendment will support States in issuing national legislation to address the existence and use of EAMR digital and other paperless forms of maintenance records. It also facilitates the development of a globally harmonized approach to the regulations governing EAMR which will improve aircraft interoperability.

6. The consequential amendment as a result of the restructuring of the *Procedures for Air Navigation Services — Aircraft Operations* (Doc 8168), Volume I — *Flight Procedures* corrects a reference following from the restructure of the this document.

7. The subjects are given in the amendment to the Foreword of Annex 6, Part II, a copy of which is in Attachment A.

8. In conformity with the Resolution of Adoption, may I request:

- a) that before 16 July 2018 you inform me if there is any part of the adopted Standards and Recommended Practices (SARPs) amendments in Amendment 36 concerning which your Government wishes to register disapproval, using the form in Attachment B for this purpose. Please note that only statements of disapproval need be registered and if you do not reply it will be assumed that you do not disapprove of the amendment;
- b) that before 8 October 2018² you inform me of the following, using the Electronic Filing of Differences (EFOD) System or the form in Attachment C for this purpose:
 - 1) any differences that will exist on 8 November 2018 between the national regulations or practices of your Government and the provisions of the whole of Annex 6, Part II, as amended by all amendments up to and including Amendment 36, and thereafter of any further differences that may arise; and
 - 2) the date or dates by which your Government will have complied with the provisions of the whole of Annex 6, Part II, as amended by all amendments up to and including Amendment 36.

9. With reference to the request in paragraph 8 a) above, it should be noted that a registration of disapproval of Amendment 36 or any part of it in accordance with Article 90 of the Convention does not constitute a notification of differences under Article 38 of the Convention. To comply with the latter provision, a separate statement is necessary if any differences do exist, as requested in paragraph 8 b) 1). It is recalled in this respect that international Standards in Annexes have a conditional binding force, to the extent that the State or States concerned have not notified any difference thereto under Article 38 of the Convention.

² 5 October 2020 for provisions indicating applicable as of 5 November 2020.

10. With reference to the request in paragraph 8 b) above, it should be also noted that the ICAO Assembly, at its 38th Session (24 September – 4 October 2013), resolved that Member States should be encouraged to use the EFOD System when notifying differences (Resolution A38-11, refers). The EFOD System is currently available on the Universal Safety Oversight Audit Programme (USOAP) restricted website (<http://www.icao.int/usoap>) which is accessible by all Member States. You are invited to consider using this for notification of compliance and differences.

11. Guidance on the determination and reporting of differences is given in the Note on the Notification of Differences in Attachment D. Please note that a detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.

12. I would appreciate it if you would also send a copy of your notifications, referred to in paragraph 8 b) above, to the ICAO Regional Office accredited to your Government.

13. At the fifth meeting of its 204th Session, the Council requested that States, when being advised of the adoption of an Annex amendment, be provided with information on implementation and available guidance material, as well as an impact assessment. This is presented for your information in Attachments E and F, respectively.

Editorial adjustment and comprehensive new edition of Annex 6, Part II

14. In order to maintain a comprehensive edition of Annex 6, Part II, provisions that will become applicable on a date after 8 November 2018 as a result of Amendment 36 are identified with an italicized paragraph number and feature the date at the beginning of each provision. Definitions related to those provisions with delayed applicability date are identified by a footnote indicating the date of applicability.

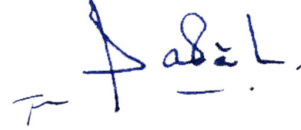
15. In addition, the following adopted amendments with delayed applicability dates will be consolidated with Amendment 36 in a new edition of the Annex and will feature the 2019 and 2020 applicability dates at the beginning of each affected provision:

- a) Amendment 34-B (adopted by Council on 2 March 2016 and applicable 7 November 2019); and
- b) Amendment 34-C (adopted by Council on 2 March 2016 and applicable 5 November 2020).

Further information relating to the new editorial adjustment is available at <https://www.icao.int/2018-amendments>.

16. As soon as practicable after the amendment becomes effective on 16 July 2018, a new edition of Annex 6, Part II incorporating Amendment 36 as well as the adopted amendments mentioned above will be forwarded to you.

Accept, Sir/Madam, the assurances of my highest consideration.

A handwritten signature in blue ink, appearing to read 'Fang Liu', with a horizontal line underneath.

Fang Liu
Secretary General

Enclosures:

- A — Amendment to the Foreword of Annex 6, Part II
- B — Form on notification of disapproval of all or part of Amendment 36 to Annex 6, Part II
- C — Form on notification of compliance with or differences from Annex 6, Part II
- D — Note on the Notification of Differences
- E — Implementation task list and outline of guidance material in relation to Amendment 36 to Annex 6, Part II
- F — Impact assessment in relation to Amendment 36 to Annex 6, Part II

ATTACHMENT A to State letter AN 11/6.3.30-18/13

AMENDMENT TO THE FOREWORD OF ANNEX 6, PART II

Add the following at the end of Table A:

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Approved Effective Applicable</i>
36	Ninth meeting of the Flight Recorder Specific Working Group (FLIRECSWG/9); third and fourth meeting of the Airworthiness Panel (AIRP/3 and AIRP/4); and the and thirteenth meeting of the Instrument Flight Procedure Panel (IFPP/13)	<ul style="list-style-type: none"> a) flight recorder requirements to include: CVR and AIR erase function; additional FDR parameters to be recorded; and simplification of flight recorder provisions; b) approval and global recognition of approved maintenance organizations (AMOs) (Phases I and II) and the introduction of the electronic aircraft maintenance records (EAMR) framework; and c) amendments as a result of the restructuring of the <i>Procedures for Air Navigation Services — Aircraft Operations, Volume I — Flight Procedures</i> (Doc 8168) 	7 March 2018 16 July 2018 8 November 2018

ATTACHMENT B to State letter AN 11/6.3.30-18/13

**NOTIFICATION OF DISAPPROVAL OF ALL OR PART OF
AMENDMENT 36 TO ANNEX 6, PART II**

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montréal, Québec
Canada H3C 5H7

(State) _____ hereby wishes to disapprove the following parts of
Amendment 36 to Annex 6, Part II:

Signature _____

Date _____

NOTES

- 1) If you wish to disapprove all or part of Amendment 36 to Annex 6, Part II, please dispatch this notification of disapproval to reach ICAO Headquarters by 16 July 2018. If it has not been received by that date it will be assumed that you do not disapprove of the amendment. **If you approve of all parts of Amendment 36, it is not necessary to return this notification of disapproval.**
- 2) This notification should not be considered a notification of compliance with or differences from Annex 6, Part II. Separate notifications on this are necessary. (See Attachment C.)
- 3) Please use extra sheets as required.

ATTACHMENT C to State letter AN 11/6.3.30-18/13

**NOTIFICATION OF COMPLIANCE WITH OR DIFFERENCES FROM ANNEX 6, PART II
(including all amendments up to and including Amendment 36)**

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montréal, Québec
Canada H3C 5H7

1. No differences will exist on _____ between the national regulations and/or practices of **(State)** _____ and the provisions of Annex 6, Part II, including all amendments up to and including Amendment 36.

2. The following differences will exist on _____ between the regulations and/or practices of **(State)** _____ and the provisions of Annex 6, Part II, including Amendment 36 (Please see Note 2) below.)

a) Annex Provision (Please give exact paragraph reference)	b) Details of Difference (Please describe the difference clearly and concisely)	c) Remarks (Please indicate reasons for the difference)
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(Please use extra sheets as required.)

3. By the dates indicated below, (State) _____ will have complied with the provisions of Annex 6, Part II, including all amendments up to and including Amendment 36 for which differences have been notified in 2 above.

a) Annex Provision (Please give exact paragraph reference)	b) Date	c) Comments
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(Please use extra sheets as required.)

Signature _____

Date _____

NOTES

- 1) If paragraph 1 above is applicable to your State, please complete paragraph 1 and return this form to ICAO Headquarters. If paragraph 2 is applicable to you, please complete paragraphs 2 and 3 and return the form to ICAO Headquarters.
- 2) A detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.
- 3) Guidance on the notification of differences is provided in the Note on the Notification of Differences and in the *Manual on Notification and Publication of Differences* (Doc 10055).
- 4) Please send a copy of this notification to the ICAO Regional Office accredited to your Government.

ATTACHMENT D to State letter AN 11/6.3.30-18/13

NOTE ON THE NOTIFICATION OF DIFFERENCES
(Prepared and issued in accordance with instructions of the Council)

1. *Introduction*

1.1 Article 38 of the *Convention on International Civil Aviation* (“Convention”) requires that a Contracting State notify ICAO any time it does not comply with a Standard in all respects, it does not bring its regulations or practices into full accord with any Standard, or it adopts regulations or practices differing in any particular respect from the Standard.

1.2 The Assembly and the Council, when reviewing the notification of differences by Contracting States in compliance with Article 38 of the Convention, have repeatedly noted that the timeliness and currency of such notifications is not entirely satisfactory. Therefore, this note is issued to reiterate the primary purpose of Article 38 of the Convention and to facilitate the determination and notification of differences.

1.3 The primary purpose of the notification of differences is to promote safety, regularity and efficiency in air navigation by ensuring that governmental and other agencies, including operators and service providers, concerned with international civil aviation are made aware of all national regulations and practices in so far as they differ from those prescribed in the Standards contained in Annexes to the Convention.

1.4 Contracting States are, therefore, requested to give particular attention to the notification of differences with respect to Standards in all Annexes, as described in paragraph 4 b) 1) of the Resolution of Adoption.

1.5 Although differences from Recommended Practices are not notifiable under Article 38 of the Convention, the Assembly has urged Contracting States to extend the above considerations to Recommended Practices contained in Annexes to the Convention, as well.

2. *Notification of differences from Standards and Recommended Practices (SARPs)*

2.1 Guidance to Contracting States in the notification of differences to Standards and Recommended Practices (SARPs) can only be given in very general terms. Contracting States are further reminded that compliance with SARPs generally extends beyond the issuance of national regulations and requires establishment of practical arrangements for implementation, such as the provision of facilities, personnel and equipment and effective enforcement mechanisms. Contracting States should take those elements into account when determining their compliance and differences. The following categories of differences are provided as a guide in determining whether a notifiable difference exists:

- a) *A Contracting State’s requirement is more exacting or exceeds a SARP (Category A)*. This category applies when the national regulation and practices are more demanding than the corresponding SARP, or impose an obligation within the scope of the Annex which is not covered by the SARP. This is of particular importance where a Contracting State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;

- b) *A Contracting State's requirement is different in character or the Contracting State has established other means of compliance (Category B)**. This category applies, in particular, when the national regulation and practices are different in character from the corresponding SARP, or when the national regulation and practices differ in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation; and
- c) *A Contracting State's requirement is less protective, partially implemented or not implemented (Category C)*. This category applies when the national regulation and practices are less protective than the corresponding SARP; when no national regulation has been promulgated to address the corresponding SARP, in whole or in part; or when the Contracting State has not brought its practices into full accord with the corresponding SARP.

These categories do not apply to Not Applicable SARP. Please see the paragraph below.

2.2 **Not Applicable SARP.** When a Contracting State deems a SARP concerning aircraft, operations, equipment, personnel, or air navigation facilities or services to be not applicable to the existing aviation activities of the State, notification of a difference is not required. For example, a Contracting State that is not a State of Design or Manufacture and that does not have any national regulations on the subject, would not be required to notify differences from Annex 8 provisions related to the design and construction of an aircraft.

2.3 **Differences from appendices, tables and figures.** The material comprising a SARP includes not only the SARP itself, but also the appendices, tables and figures associated with the SARP. Therefore, differences from appendices, tables and figures are notifiable under Article 38. In order to file a difference against an appendix, table or figure, States should file a difference against the SARP that makes reference to the appendix, table or figure.

2.4 **Differences from definitions.** Contracting States should notify differences from definitions. The definition of a term used in a SARP does not have independent status but is an essential part of each SARP in which the term is used. Therefore, a difference from the definition of the term may result in there being a difference from any SARP in which the term is used. To this end, Contracting States should take into consideration differences from definitions when determining compliance or differences to SARPs in which the terms are used.

2.5 The notification of differences should be not only to the latest amendment but to the whole Annex, including the amendment. In other words, Contracting States that have already notified differences are requested to provide regular updates of the differences previously notified until the difference no longer exists.

2.6 Further guidance on the identification and notification of differences, examples of well-defined differences and examples of model processes and procedures for management of the notification of differences can be found in the *Manual on Notification and Publication of Differences* (Doc 10055).

* The expression "different in character or other means of compliance" in b) would be applied to a national regulation and practice which achieve, by other means, the same objective as that of the corresponding SARPs or for other substantive reasons so cannot be classified under a) or c).

3. *Form of notification of differences*

3.1 Differences can be notified:

- a) by sending to ICAO Headquarters a form on notification of compliance or differences; or
- b) through the Electronic Filing of Differences (EFOD) System at www.icao.int/usoap.

3.2 When notifying differences, the following information should be provided:

- a) the number of the paragraph or subparagraph which contains the SARP to which the difference relates*;
- b) the reasons why the State does not comply with the SARP, or considers it necessary to adopt different regulations or practices;
- c) a clear and concise description of the difference; and
- d) intentions for future compliance and any date by which your Government plans to confirm compliance with and remove its difference from the SARP for which the difference has been notified.

3.3 The differences notified will be made available to other Contracting States, normally in the terms used by the Contracting State when making the notification. In the interest of making the information as useful as possible, Contracting States are requested to ensure that:

- a) statements be as clear and concise as possible and be confined to essential points;
- b) the provision of extracts from national regulations not be considered as sufficient to satisfy the obligation to notify differences; and
- c) general comments, unclear acronyms and references be avoided.

* This applies only when the notification is made under 3.1 a).

**IMPLEMENTATION TASK LIST AND OUTLINE OF GUIDANCE MATERIAL
IN RELATION TO AMENDMENT 36 TO ANNEX 6, PART II**

1. IMPLEMENTATION TASK LIST

1.1 Essential steps to be followed by a State in order to implement the amendment to Annex 6, Part II:

- a) identification of the rule-making process necessary to transpose the amendments concerning the following provisions into the national regulation taking into consideration the applicability date:
 - 1) CVR and AIR erase function, flight data recorder parameter lists and simplification of the flight recorder SARPs;
 - 2) approval and global recognition of approved maintenance organizations (AMOs) (Phases I and II) and the introduction of the electronic aircraft maintenance records (EAMR) framework; if applicable, amendment of existing 83 *bis* agreements; and
 - 3) amendments as a result of the restructuring of the *Procedures for Air Navigation Services — Aircraft Operations*, Volume I — *Flight Procedures* (Doc 8168);
- b) identification and notification of differences, if applicable;
- c) establishment of a national implementation plan that takes into consideration the provisions that are under development to complement the above provisions and to confirm compliance for each applicable air operator;
- d) drafting of the amendment(s) to the national requirements and means of compliance;
- e) official adoption of national requirements and/or means of compliance (industry guidance);
- f) amendment of air operator certification and/or surveillance programmes to include new requirements;
- g) revision of guidance material(s) and checklist(s) for applicable inspectors that support air operator and approved maintenance organization certification, surveillance and the resolution of any issues identified;
- h) training of inspectors based on the revised inspector guidance material;
- i) operational acceptance of policy and procedures of operator(s) and approved maintenance organizations to comply with applicable requirements.

2. STANDARDIZATION PROCESS

2.1 Effective date: 16 July 2018

2.2 Applicability date: 8 November 2018

2.3 Embedded applicability date(s):

- a) 5 November 2020 for elements concerning approval and global recognition of AMOs and the introduction of the EAMR framework; and
- b) 1 January 2023 for elements concerning flight data recorder parameter lists, and CVR and AIR erase functions.

3. SUPPORTING DOCUMENTATION

3.1 ICAO documentation

Title	Type (PANS/TI/Manual/Circ)	Planned publication date
<i>Manual of Aircraft Accident and Incident Investigation (Doc 9756)</i>	Manual	Available
<i>Manual on Flight Crew-Machine Interface Recordings (Doc 10101) (under development)</i>	Manual	November 2019
<i>Airworthiness Manual (Doc 9760)</i>	Manual	2018
<i>Manual on the implementation of Article 83 bis of the Convention on International Civil Aviation (Doc 10059)</i>	Manual	2018
<i>Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335)</i>	Manual	2018
<i>Safety Management Manual (SMM) (Doc 9859)</i>	Manual	2018
<i>Human Factors Guidelines for Aircraft Maintenance Manual (Doc 9824)</i>	Manual	2018
<i>Human Factors Guidelines for Safety Audits Manual (Doc 9806)</i>	Manual	2018
<i>Manual of Procedures for Establishment and Management of a State's Personnel Licensing System (Doc 9379)</i>	Manual	2018

3.2 External documentation

Title	External Organization	Publication date
EUROCAE ED-112A	EUROCAE	September 2013
EUROCAE ED-155	EUROCAE	July 2009
EUROCAE ED-55	EUROCAE	September 1998
EUROCAE ED-56A	EUROCAE	November 1996

4. IMPLEMENTATION ASSISTANCE TASKS

Type	Global	Regional
Increased awareness		By RASGs, RSOOs, and COSCAPs regarding amendments to Annex 6, Part II
Workshop/Seminar		By regional offices regarding amendments to Annex 6, Part II and guidance materials on the AMO and EAMR provisions

5. UNIVERSAL SAFETY OVERSIGHT AUDIT PROGRAMME (USOAP)

5.1 The content of this paper may require an amendment of the USOAP continuous monitoring approach (CMA) protocol questions in the areas of accident investigation (AIG), airworthiness of aircraft (AIR), air navigation services (ANS) and aircraft operations (OPS) to assess effective implementation by States. Existing protocol questions may need amendment or new protocol questions may be required. This will be assessed during the next amendment cycle of the protocol questions.

IMPACT ASSESSMENT IN RELATION TO AMENDMENT 36 TO ANNEX 6, PART II

1. INTRODUCTION

1.1 Amendment 36 to Annex 6, Part II is intended to:

- a) provide for the protection of CVR and AIR data by the erase function. The additional flight data recorder parameters and simplification of the flight recorder SARPs are intended to make flight recorder data available for effective and efficient accident and incident investigations;
- b) promote the mutual recognition of approved maintenance organizations (AMOs) and ensure a clear allocation of responsibilities to the State of Registry, and introduce provisions linked to the electronic aircraft maintenance records (EAMR) framework; and
- c) update references as a result of the restructuring of *Procedures for Air Navigation Services — Aircraft Operations*, Volume I — *Flight Procedures* (Doc 8168).

2. IMPACT ASSESSMENT

2.1 **CVR and AIR erase function, flight data recorder parameter lists and the simplification of flight recorder SARPs**

2.1.1 *Safety impact:* The amendment will allow for improved protection of CVR and AIR data, enabling States to conduct more effective and efficient accident and incident investigations based on additional flight recorder data. This will improve the safety value of investigations.

2.1.2 *Financial impact:*

2.1.2.1 The cost impact to States relates to promulgating the regulations for the erase function and additional flight data recorder parameters and to include these requirements in the air operator oversight system. The simplified flight recorder provisions will assist the understanding of these provisions, resulting in less resources required.

2.1.2.2 The cost impact to industry for the erase function and additional flight data recorder parameters implies either equipping aircraft or, in the case of recording additional parameters, modifying the dataframe layout. Additionally, amending related aircraft documentation will result in negligible financial impact to the industry. Considering the provisions are mostly for new type certificate (newly designed) aircraft from 1 January 2023 onwards, this cost would be absorbed as part of the manufacturing cost of the aircraft.

2.1.3 *Security impact:* No security impact is foreseen with the implementation of this amendment.

2.1.4 *Environmental impact:* The environmental impact with the implementation of these provisions is considered negligible.

2.1.5 *Efficiency impact:* It is not anticipated that there will be a significant change in the efficiency of the air transportation system.

2.1.6 *Expected implementation time:* Implementation time will depend on the timelines of States to amend their regulations. From an equipage perspective and recalling the embedded applicability date for some of the provisions of 1 January 2023, the industry implementation period is estimated to be feasible in that period. Operators will have to amend their policies and procedures, including training of relevant personnel, to accommodate the requirements prior to the applicability date.

2.2 **Approval and global recognition of AMOs (Phases I and II) and the introduction of provisions linked to EAMR framework**

2.2.1 *Safety impact:* There will be a positive safety impact with the implementation of this amendment. The AMO provision clarifies the responsibilities of operators and maintenance organizations, particularly in relation to which records must be retained, and supports the option for the State of Registry to recognize an AMO approval issued by another Contracting State, promoting the exchange of information between such States. The EAMR provision ensures the accurate recording and real-time accessibility of continuing airworthiness aircraft maintenance status and aircraft maintenance-related work completion.

2.2.2 *Financial impact:* There will be a significant reduction in cost and a positive financial impact to States and industry with the implementation of this amendment.

2.2.3 *Security impact:* No security impact with the implementation of the amendment concerning AMOs. Physical security requirements are still applicable. Cybersecurity should be addressed as part of the overall aviation organization structure. The EAMR specific cybersecurity requirements will represent a very limited set of the overall cybersecurity mechanism required to be implemented by aviation stakeholders.

2.2.4 *Environmental impact:* Implementation of the AMO provisions has no environmental impact. The EAMR is a paperless aircraft technical operations component which lowers the environmental footprint of aviation entities. The significant reduction of demand for use of paper will put less stress on the supporting natural resources and reduce waste.

2.2.5 *Efficiency impact:* Implementation of these AMO provisions will support a positive change in the efficiency of the air transportation system. The amendment supports the option for the State of Registry to recognize an AMO approval issued by another Contracting State, promoting also the exchange of information between such States. There will be a positive change in the efficiency of the air transportation system. Rapid and accurate search, sort and monitor capabilities will drastically reduce the time required compared to paper records processing. Maintenance records transfer required to take place between aviation entities will be facilitated at significantly reduced time and cost.

2.2.6 *Expected implementation time:* The expected implementation time for the AMO provisions would be two to five years and for the EAMR provisions, one to two years.

2.2.7 For States, the changes introduced in Annexes 1, 6 and 8 consist of the uniform application of the terms “repairs”, “modifications” and “maintenance release”, the appropriate use of the terms “maintenance records” and “continuing airworthiness records” and the transfer of the AMO approval provisions from Annex 6 to Annex 8.

2.2.8 This may require certain changes to definitions, terms and cross-references in the procedures of the competent authorities and in their national legislation. Additionally, certain changes may be needed to the references contained in existing *83bis* agreements between States. It is not expected, however, that the changes to the Annexes will affect the substance of the procedures and national legislation. On the other hand, the procedures and national legislations of certain States may be affected by the introduction of provisions to facilitate the standardization of the approval and recognition process of AMO regulations foreseen with the implementation of this amendment. This may take two to five years.

2.2.9 For industry, the changes introduced in Annexes 1, 6 and 8 are only expected to affect some definitions, terms and cross references contained in the “maintenance organization’s manual” (AMO) and in the “maintenance control manual” (operator). This can be performed within one to two years.

2.2.10 Additional changes may be needed if the State of Registry decides to introduce changes to their legislation related to the guidance to be provided in Doc 9760.

2.3 **Amendments as a result of the restructuring of PANS-OPS, Volume I**

2.3.1 *Safety impact:* No safety impact with the implementation of this amendment.

2.3.2 *Financial impact:* Minimal financial impact with the implementation of this amendment from changes to regulatory material in line with the editorial change.

2.3.3 *Security impact:* No security impact with the implementation of this amendment.

2.3.4 *Environmental impact:* Implementation of these provisions has no environmental impact.

2.3.5 *Efficiency impact:* It is not anticipated that there will be a net change in the efficiency of the air transportation system.

2.3.6 *Expected implementation time:* Minimal time needed to update regulations where necessary.

AMENDMENT No. 36

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

OPERATION OF AIRCRAFT

ANNEX 6

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

**PART II
INTERNATIONAL GENERAL AVIATION — AEROPLANES**

The amendment to Annex 6, Part II, contained in this document was adopted by the Council of ICAO on **7 March 2018**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **16 July 2018** will become effective on that date and will become applicable on **8 November 2018** as specified in the Resolution of Adoption. (State letter AN 11/6.3.30-18/13 refers.)

MARCH 2018

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AMENDMENT 36 TO THE INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

**ANNEX 6 — OPERATION OF AIRCRAFT,
PART II — INTERNATIONAL GENERAL AVIATION — AEROPLANES**

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

1. *Hereby adopts* on 7 March 2018 Amendment 36 to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Operation of Aircraft, International General Aviation — Aeroplanes* which for convenience is designated Annex 6, Part II to the Convention;
2. *Prescribes* 16 July 2018 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the council before that date;
3. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 8 November 2018 unless otherwise indicated;
4. *Requests the Secretary General:*
 - a) to notify each Contracting State immediately of the above action and immediately after 16 July 2018 of those parts of the amendment which have become effective;
 - b) to request each Contracting State:
 - 1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 8 November 2018 between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 8 October 2018¹, and thereafter to notify the Organization of any further differences that arise;
 - 2) to notify the Organization before 8 October 2018¹ of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended;
 - c) to invite each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, when the notification of such differences is important for the safety of air navigation, following the procedure specified in subparagraph b) above with respect to differences from Standards.

¹ 5 October 2020 for provisions indicating applicable as of 5 November 2020.

**NOTES ON THE PRESENTATION OF THE
AMENDMENT TO ANNEX 6, PART II**

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

~~Text to be deleted is shown with a line through it.~~

text to be deleted

New text to be inserted is highlighted with grey shading.

new text to be inserted

~~Text to be deleted is shown with a line through it~~
followed by the replacement text which is highlighted
with grey shading.

new text to replace existing text

TEXT OF AMENDMENT 36

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

OPERATION OF AIRCRAFT

ANNEX 6

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

PART II

INTERNATIONAL GENERAL AVIATION — AEROPLANES

...

SECTION 1. GENERAL

CHAPTER 1.1 DEFINITIONS

...

Appropriate airworthiness requirements. The comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration.

...

Continuing airworthiness records. Records which are related to the continuing airworthiness status of an aircraft, engine, propeller or associated part.

...

Instrument approach procedure (IAP). A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

Non-precision approach (NPA) procedure. An instrument approach procedure designed for 2D instrument approach operations Type A.

Note.— Non-precision approach procedures may be flown using a continuous descent final approach (CDFA) technique. CDFAs with advisory vertical navigation (VNAV) guidance calculated by on-board equipment (see ~~PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, 1.8.1~~) are considered 3D instrument approach operations. CDFAs with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFAs, refer to PANS-OPS (Doc 8168), Volume I, ~~Part I, Section 4, Chapter 1, 1.7 and 1.8~~ Part II, Section 5.

...

Maintenance.[†] The performance of tasks required to ensure the continuing airworthiness of an aircraft, including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

Maintenance.^{††} The performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

...

Maintenance release.[†] A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner, either in accordance with the approved data and the procedures described in the maintenance organization's procedures manual or under an equivalent system.

Maintenance release.^{††} A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner, ~~either in accordance with the approved data and the procedures described in the maintenance organization's procedures manual or under an equivalent system~~ appropriate airworthiness requirements.

...

Modification. A change to the type design of an aircraft, engine or propeller.

Note.— a modification may also include the embodiment of the modification which is a maintenance task subject to a maintenance release. Further guidance on aircraft maintenance – modification and repair is contained in the Airworthiness Manual (Doc 9760).

...

Repair.[†] The restoration of an aeronautical product to an airworthy condition to ensure that the aircraft continues to comply with the design aspects of the appropriate airworthiness requirements used for the issuance of the type certificate for the respective aircraft type, after it has been damaged or subjected to wear.

Repair.^{††} The restoration of an aeronautical product aircraft, engine, propeller or associated part to an airworthy condition ~~to ensure that the aircraft continues to comply with the design aspects of the appropriate airworthiness requirements used for the issuance of the type certificate for the respective aircraft type,~~ in accordance with the appropriate airworthiness requirements after it has been damaged or subjected to wear.

...

[†] Applicable until 4 November 2020.

^{††} Applicable as of 5 November 2020.

SECTION 2. GENERAL AVIATION OPERATIONS

...

CHAPTER 2.2 FLIGHT OPERATIONS

...

2.2.2 Operational management

...

2.2.2.2 Aerodrome operating minima

...

2.2.2.2.3 The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDH), minimum visibility and, if necessary, cloud conditions.

Note.— For guidance on applying a continuous descent final approach (CDFA) flight technique on non-precision approach procedures, refer to PANS-OPS (Doc 8168), Volume I, ~~Part I, Section 4, Chapter 1, paragraph 1.7~~ Part II, Section 5.

...

CHAPTER 2.4 AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

...

2.4.16 Flight recorders

Note 1.— ~~Crash-protected flight recorders comprise one or more of the following systems: a flight data recorder (FDR); a cockpit voice recorder (CVR); an airborne image recorder (AIR); and/or a data link recorder (DLR). Image and data link information may be recorded on either the CVR or the FDR.~~

Note 2.— ~~Lightweight flight recorders comprise one or more of the following systems: an aircraft data recording system (ADRS); a cockpit audio recording system (CARS); an airborne image recording system (AIRS); and/or a data link recording system (DLRS). Image and data link information may be recorded on either the CARS or the ADRS.~~

*Note 3.— ~~Detailed guidance requirements on flight recorders is~~ **are** contained in Appendix 2.3.*

Note 4.— ~~For aeroplanes for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.~~

Note 5.— ~~For aeroplanes for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.~~

Note 6.— Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.

...

2.4.16.1 Flight data recorders and aircraft data recording systems

Note.— Parameters to be recorded are listed in Tables A2.3-1 and A2.3-3 of Appendix 2.3.

2.4.16.1.1 Types

~~— 2.4.16.1.1.1 Types I and IA FDRs shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power, configuration and operation.~~

~~— 2.4.16.1.1.2 Type II FDRs shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power and configuration of lift and drag devices.~~

2.4.16.1.2¹ Operation Applicability

2.4.16.1.2¹.1 **Recommendation.**— All turbine-engined aeroplanes with a seating configuration of more than five passenger seats and a maximum certificated take-off mass of 5 700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 should be equipped with:

- a) ~~an Type II FDR~~ which should record at least the first 16 parameters in Table A2.3-1 of Appendix 2.3; or
- b) a Class C AIR or AIRS ~~capable of recording~~ which should record at least the flight path and speed parameters displayed to the pilot(s), as defined in 2.2.2 of Appendix 2.3; or
- c) an ADRS which should record at least ~~capable of recording the essential~~ first 7 parameters ~~defined~~ listed in Table A2.3-3 of Appendix 2.3.

Note.— AIR or AIRS classification is defined in 4.1 of Appendix 2.3.

~~— 2.4.16.1.2.2 All aeroplanes for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, and which are required to be fitted with an FDR, shall record the following parameters at a maximum recording interval of 0.125 seconds:~~

~~— Pilot input and/or control surface position — primary controls (pitch, roll, yaw).~~

~~— Note 1. — For aeroplanes with control systems in which movement of a control surface will back drive the pilot's control, "or" applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot's control, "and" applies. In aeroplanes with independent moveable surfaces, each surface needs to be recorded separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.~~

Note 2.— "The application for type certification that is submitted to a Contracting State" refers to the date of application of the original "Type Certificate" for the aeroplane type, not the date of certification of particular aeroplane variants or derivative models.

2.4.16.1.1.2 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in Table A2.3-1 of Appendix 2.3.

2.4.16.1.1.3 **Recommendation.**— *All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023 should be equipped with an FDR capable of recording at least the 82 parameters listed in Table A2.3-1 of Appendix 2.3.*

2.4.16.1.32 ~~Discontinuation~~ Recording technology

— 2.4.16.1.3.1—FDRs, ADRS, AIRs or AIRS shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape. ~~The use of engraving metal foil FDRs shall be discontinued.~~

— 2.4.16.1.3.2—~~The use of analogue FDRs using frequency modulation (FM) shall be discontinued.~~

— 2.4.16.1.3.3—~~The use of photographic film FDRs shall be discontinued.~~

— 2.4.16.1.3.4—**Recommendation.**—*The use of magnetic tape FDRs should be discontinued.*

— 2.4.16.1.3.5—~~The use of magnetic tape FDRs shall be discontinued by 1 January 2016.~~

2.4.16.1.43 Duration

All FDRs shall ~~be capable of retaining~~ the information recorded during at least the last 25 hours of their operation.

2.4.16.2 Cockpit voice recorders and cockpit audio recording systems

2.4.16.2.1 ~~Operation~~ Applicability

Recommendation.— *All turbine-engined aeroplanes with a seating configuration of more than five passenger seats and a maximum certificated take-off mass of 5 700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 and required to be operated by more than one pilot should be equipped with either a CVR or a CARS.*

2.4.16.2.2 ~~Discontinuation~~ Recording technology

— 2.4.16.2.2.1—CVRs and CARS shall not use magnetic tape or wire ~~The use of magnetic tape and wire CVRs shall be discontinued by 1 January 2016.~~

— 2.4.16.2.2.2—**Recommendation.**—*The use of magnetic tape and wire CVRs should be discontinued.*

2.4.16.2.3 Duration

— 2.4.16.2.3.1—~~All CVRs shall be capable of retaining the information recorded during at least the last 30 minutes of their operation.~~

~~2.4.16.2.3.2~~ From 1 January 2016, ~~a~~All CVRs shall be capable of retaining the information recorded during at least the last ~~two~~2 hours of their operation.

~~2.4.16.2.3.3 Recommendation.~~ *All aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 1990, and that are required to be equipped with a CVR, should have a CVR capable of retaining the information recorded during at least the last two hours of their operation.*

2.4.16.3 Data link recorders

2.4.16.3.1 Applicability

2.4.16.3.1.1 All aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which utilize any of the data link communications applications listed in 5.1.2 of Appendix 2.3 and are required to carry a ~~cockpit voice recorder (CVR)~~, shall record on a ~~crash-protected flight recorder~~ all data link communications messages.

2.4.16.3.1.2 All aeroplanes which are modified on or after 1 January 2016 to install and utilize any of the data link communications applications listed in 5.1.2 of Appendix 2.3 and are required to carry a CVR shall record on a ~~crash-protected flight recorder~~ the data link communications messages.

~~Note 1.~~ *Data link communications are currently conducted by either ATN-based or FANS 1/A-equipped aircraft.*

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

2.4.16.3.2 Duration

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

2.4.16.3.3 Correlation

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

2.4.16.4 Flight recorders — general

2.4.16.4.1 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.

2.4.16.4.2 Operation

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

2.4.16.4.2.2 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 Annex 13.

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 pilot-in-command's responsibilities regarding the retention of flight recorder records are contained in 2.4.16.4.3.

2.4.16.4.3 Flight recorder records

The pilot-in-command, and/or the owner/operator, shall ensure, to the extent possible, in the event the aeroplane becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Annex 13.

2.4.16.4.4 Continued serviceability

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 2.3.

2.4.16.4.5 Flight recorder electronic documentation

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

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

...

CHAPTER 2.6 AEROPLANE MAINTENANCE*

...

2.6.1 Owner's maintenance responsibilities*

...

2.6.1.2 ~~The~~ Until 4 November 2020, the owner or the lessee shall not operate the aeroplane unless it is maintained and released to service under a system acceptable to the State of Registry.

* As of 5 November 2020, the following Chapter and section will be titled:
 Chapter 2.6 — Aeroplane Continuing Airworthiness
 Paragraph 2.6.1 — Owner's continuing airworthiness responsibilities

2.6.1.2 ~~The owner or the lessee shall not operate the aeroplane unless it is maintained and released to service under a system acceptable to the State of Registry.~~ As of 5 November 2020, the owner or the lessee shall not operate an aeroplane unless maintenance on the aeroplane, including any associated engine, propeller and part, is carried out:

- a) by an organization complying with Annex 8, Part II, Chapter 6 that is either approved by the State of Registry of the aeroplane or is approved by another Contracting State and is accepted by the State of Registry; or
- b) by a person or organization in accordance with procedures that are authorized by the State of Registry;

and there is a maintenance release in relation to the maintenance carried out.

2.6.1.3 ~~When~~ Until 4 November 2020, when the maintenance release is not issued by an approved maintenance organization in accordance with Annex 6, Part I, 8.7, the person signing the maintenance release shall be licensed in accordance with Annex 1.

2.6.1.4 The owner or the lessee shall ensure that the maintenance of the aeroplane is performed in accordance with a maintenance programme acceptable to the State of Registry.

2.6.2 Maintenance records*

...

2.6.2.3 In the event of a temporary change of owner or lessee, the records shall be made available to the new owner or lessee. In the event of any permanent change of owner or lessee, the records shall be transferred to the new owner or lessee.

...

Note 1. — Until 4 November 2020, maintenance ~~Maintenance~~ records or related documents, other than a valid certificate of airworthiness, need not be carried in the aeroplane during international flights.

Note 1. — ~~Maintenance~~ As of 5 November 2020, continuing airworthiness records or related documents, other than a valid certificate of airworthiness, need not be carried in the aeroplane during international flights.

...

2.6.2.4 As of 5 November 2020, records kept and transferred in accordance with 2.6.2 shall be maintained in a form and format that ensures readability, security and integrity of the records at all times.

Note 1.— The form and format of the records may include, for example, paper records, film records, electronic records or any combination thereof.

Note 2.— Guidance regarding electronic aircraft continuing airworthiness records is included in the Airworthiness Manual (Doc 9760).

* As of 5 November 2020, 2.6.2 will be titled *Continuing Airworthiness Records*.

...

2.6.4 Maintenance release

2.6.4.1 ~~A~~ Until 4 November 2020, a maintenance release shall be completed and signed, as prescribed by the State of Registry, to certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures acceptable to the State of Registry.

2.6.4.1 As of 5 November 2020, when maintenance is carried out by an approved maintenance organization, the maintenance release shall be issued by the approved maintenance organization in accordance with the provisions of Annex 8, Part II, 6.8.

~~2.6.4.1-4.2~~ ~~A~~ As of 5 November 2020, when maintenance is not carried out by an approved maintenance organization, the maintenance release shall be completed and signed by a person appropriately licensed in accordance with Annex 1, ~~as prescribed by the State of Registry~~, to certify that the maintenance work performed has been completed satisfactorily and in accordance with data and procedures acceptable to the State of Registry.

2.6.4.2 ~~A~~ Until 4 November 2020, a maintenance release shall contain a certification including:

- a) basic details of the maintenance performed;
- b) the date such maintenance was completed;
- c) when applicable, the identity of the approved maintenance organization; and
- d) the identity of the authorized person or persons signing the release.

~~2.6.4.2-4.3~~ ~~A~~ As of 5 November 2020, when maintenance is not carried out by an approved maintenance organization, the maintenance release shall ~~contain a certification including~~ include the following:

- a) basic details of the maintenance performed;
- b) the date such maintenance was completed; and
- ~~e) when applicable, the identity of the approved maintenance organization; and~~
- ~~d~~-c) the identity of the authorized person or persons signing the release.

...

CHAPTER 2.8 MANUALS, LOGS AND RECORDS

Note.— The following documents are associated with this Annex but are not included in this chapter:

*Maintenance records — see 2.6.2**

...

* As of 5 November 2020, section 2.6.2 will be titled *Continuing Airworthiness Records*.

APPENDIX 2.3 FLIGHT RECORDERS

(Section 2, Chapter 2.4, 2.4.16, refers)

The material in this Appendix concerns flight recorders intended for installation in aeroplanes engaged in international air navigation. Crash-protected flight recorders comprise one or more of the following systems: a flight data recorder (FDR); a cockpit voice recorder (CVR); an airborne image recorder (AIR); and/or a data link recorder (DLR). Lightweight flight recorders comprise one or more of the following systems: an aircraft data recording system (ADRS); a cockpit audio recording system (CARS); an airborne image recording system (AIRS); and/or a data link recording system (DLRS).

1. GENERAL REQUIREMENTS

1.1 Non-deployable flight recorder containers shall be painted a distinctive orange colour.:

a) ~~be painted a distinctive orange or yellow colour~~

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

ab) carry reflective material to facilitate their location; and

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

~~— Note. — Current industry practice is to phase out yellow flight recorder containers at the end of the service life of the flight recorders.~~

1.3 Automatic deployable flight recorder containers shall:

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

b) carry reflective material to facilitate their location; and

c) have an integrated automatically activated ELT.

1.4~~2~~ The flight recorder systems shall be installed so that:

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

b) ~~they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardizing service to essential or emergency loads;~~

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

dc) 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; and

d) aeroplanes 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 flight recorder systems shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardizing service to essential or emergency loads.

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

1.74 Means shall be provided for an accurate time correlation between the recorder systems recordings.

1.85 The manufacturer shall provide the appropriate certifying authority with the following information in respect of the flight recorder systems:

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

~~2.1 The flight data recorder~~ The FDR or ADRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power.

2.2 Parameters to be recorded

Note.— In previous editions of Annex 6, Part II, types of recorders were defined to capture the first evolutions of FDRs.

~~2.2.1 Flight data recorders shall be classified as Type I, Type IA and Type II depending upon the number of parameters to be recorded.~~

2.2.2.1 The parameters that satisfy the requirements for FDRs are listed in the paragraphs below

Table A2.3-1. The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

Editorial note.— Move unnumbered paragraph from below Table A2.3-1 and insert as new paragraph 2.2.2.

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

- a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority:
 - 1) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;
 - 2) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, ETC.;
 - 3) warnings and alerts; and
 - 4) the identity of displayed pages for emergency procedures and checklists; and
- b) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.

~~— 2.2.2.1 The following parameters shall satisfy the requirements for flight path and speed:~~

- ~~—— Pressure altitude~~
- ~~—— Indicated airspeed or calibrated airspeed~~
- ~~—— Air ground status and each landing gear air ground sensor when practicable~~
- ~~—— Total or outside air temperature~~
- ~~—— Heading (primary flight crew reference)~~
- ~~—— Normal acceleration~~
- ~~—— Lateral acceleration~~
- ~~—— Longitudinal acceleration (body axis)~~
- ~~—— Time or relative time count~~
- ~~—— Navigation data*: drift angle, wind speed, wind direction, latitude/longitude~~
- ~~—— Groundspeed*~~
- ~~—— Radio altitude*~~

~~— 2.2.2.2 The following parameters shall satisfy the requirements for attitude:~~

- ~~—— Pitch attitude~~
- ~~—— Roll attitude~~

~~———— Yaw or sideslip angle*~~

~~———— Angle of attack*~~

~~———— 2.2.2.3 The following parameters shall satisfy the requirements for engine power:~~

~~———— Engine thrust/power: propulsive thrust/power on each engine, cockpit thrust/power lever position~~

~~———— Thrust reverse status*~~

~~———— Engine thrust command*~~

~~———— Engine thrust target*~~

~~———— Engine bleed valve position*~~

~~———— Additional engine parameters*: EPR, N_1 , indicated vibration level, N_2 , EGT, TLA, fuel flow, fuel cut-off lever position, N_3~~

~~———— 2.2.2.4 The following parameters shall satisfy the requirements for configuration:~~

~~———— Pitch trim surface position~~

~~———— Flaps*: trailing edge flap position, cockpit control selection~~

~~———— Slats*: leading edge flap (slat) position, cockpit control selection~~

~~———— Landing gear*: landing gear, gear selector position~~

~~———— Yaw trim surface position*~~

~~———— Roll trim surface position*~~

~~———— Cockpit trim control input position pitch*~~

~~———— Cockpit trim control input position roll*~~

~~———— Cockpit trim control input position yaw*~~

~~———— Ground spoiler and speed brake*: Ground spoiler position, ground spoiler selection, speed brake position, speed brake selection~~

~~———— De-icing and/or anti-icing systems selection*~~

~~———— Hydraulic pressure (each system)*~~

~~———— Fuel quantity in CG trim tank*~~

~~———— AC electrical bus status*~~

~~———— DC electrical bus status*~~

~~———— APU bleed valve position*~~

~~———— Computed centre of gravity*~~

~~———— 2.2.2.5 The following parameters shall satisfy the requirements for operation:~~

~~———— Warnings~~

~~———— Primary flight control surface and primary flight control pilot input: pitch axis, roll axis, yaw axis~~

~~———— Marker beacon passage~~

~~———— Each navigation receiver frequency selection~~

~~———— Manual radio transmission keying and CVR/FDR synchronization reference~~

~~———— Autopilot/autothrottle/AFCS mode and engagement status*~~

~~———— Selected barometric setting*: pilot, first officer~~

~~———— Selected altitude (all pilot selectable modes of operation)*~~

~~———— Selected speed (all pilot selectable modes of operation)*~~

~~———— Selected Mach (all pilot selectable modes of operation)*~~

~~———— Selected vertical speed (all pilot selectable modes of operation)*~~

~~———— Selected heading (all pilot selectable modes of operation)*~~

- ~~———— Selected flight path (all pilot selectable modes of operation)*: course/DSTRK, path angle~~
- ~~———— Selected decision height*~~
- ~~———— EFIS display format*: pilot, first officer~~
- ~~———— Multi-function/engine/alerts display format*~~
- ~~———— GPWS/TAWS/GCAS status*: selection of terrain display mode including pop-up display status, terrain alerts, both cautions and warnings, and advisories, on/off switch position~~
- ~~———— Low pressure warning*: hydraulic pressure, pneumatic pressure~~
- ~~———— Computer failure*~~
- ~~———— Loss of cabin pressure*~~
- ~~———— TCAS/ACAS (traffic alert and collision avoidance system/airborne collision avoidance system)*~~
- ~~———— Ice detection*~~
- ~~———— Engine warning each engine vibration*~~
- ~~———— Engine warning each engine over temperature*~~
- ~~———— Engine warning each engine oil pressure low*~~
- ~~———— Engine warning each engine over speed*~~
- ~~———— Wind shear warning*~~
- ~~———— Operational stall protection, stick shaker and pusher activation*~~
- ~~———— All cockpit flight control input forces*: control wheel, control column, rudder pedal cockpit input forces~~
- ~~———— Vertical deviation*: ILS glide path, MLS elevation, GNSS approach path~~
- ~~———— Horizontal deviation*: ILS localizer, MLS azimuth, GNSS approach path~~
- ~~———— DME 1 and 2 distances*~~
- ~~———— Primary navigation system reference*: GNSS, INS, VOR/DME, MLS, Loran C, ILS~~
- ~~———— Brakes*: left and right brake pressure, left and right brake pedal position~~
- ~~———— Date*~~
- ~~———— Event marker*~~
- ~~———— Head-up display in use*~~
- ~~———— Para visual display on*~~

~~———— *Note.* It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the range, sampling, accuracy or resolution guidance detailed in this Appendix.~~

~~———— 2.2.2.6 *Type IA FDR.* This FDR shall be capable of recording, as appropriate to the aeroplane, at least the 78 parameters in Table A2.3-1.~~

~~———— 2.2.2.7 *Type I FDR.* This FDR shall be capable of recording, as appropriate to the aeroplane, at least the first 32 parameters in Table A2.3-1.~~

~~———— 2.2.2.8 *Type II FDR.* This FDR shall be capable of recording, as appropriate to the aeroplane, at least the first 15 parameters in Table A2.3-1.~~

2.2.2.9.3 The parameters that satisfy the recommendations for flight path and speed as displayed to the pilot(s) are listed below. The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) are to be recorded if an information source for the parameter is displayed to the pilot and is practicable to record:

- Pressure altitude
- Indicated airspeed or calibrated airspeed
- Heading (primary flight crew reference)

- Pitch attitude
- Roll attitude
- Engine thrust/power
- Landing gear status*
- Total or outside air temperature*
- Time*
- Navigation data*: Drift angle, wind speed, wind direction, latitude/longitude
- Radio altitude*

2.2.4 The parameters that satisfy the requirements for ADRS are listed in Table A2.3-3.

2.3 Additional information

~~2.3.1 A Type II A FDR, in addition to a 30 minute recording duration, shall retain sufficient information from the preceding take-off for calibration purposes.~~

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

2.3.3.2 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.

3. COCKPIT VOICE RECORDER (CVR) AND COCKPIT AUDIO RECORDING SYSTEM (CARS)

3.1 ~~Signals to be recorded~~ Start and stop logic

The CVR ~~and or~~ CARS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR ~~and 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

~~3.4.1-2.1~~ 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 aeroplane by radio;
- b) aural environment on the flight deck;
- c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed;
- d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and

e) digital communications with ATS, unless recorded by the FDR.

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
- d) cockpit area microphone.

~~3.1.2-2.3~~ 3.1.3 The CARS shall record simultaneously on two separate channels, or more, at least the following:

- a) voice communication transmitted from or received in the aeroplane by radio;
- b) aural environment on the flight deck; and
- c) voice communication of flight crew members on the flight deck using the aeroplane'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.

~~3.1.3~~ The recorder shall be capable of recording on at least four channels simultaneously except for the recorder in 3.6.3.2.1.3. On a tape based CVR, to ensure accurate time correlation between channels, the recorder shall record in an in line format. If a bi directional configuration is used, the in line format and channel allocation shall be retained in both directions.

~~3.1.4~~ The preferred channel allocation shall be as follows:

~~Channel 1~~ ~~co pilot headphones and live boom microphone~~

~~Channel 2~~ ~~pilot headphones and live boom microphone~~

~~Channel 3~~ ~~area microphone~~

~~Channel 4~~ ~~time reference plus the third and fourth crew members' headphone and live microphone, if applicable.~~

~~Note 1.~~ ~~Channel 1 is located closest to the base of the recording head.~~

~~Note 2.~~ ~~The preferred channel allocation presumes use of current conventional magnetic tape transport mechanisms and is specified because the outer edges of the tape have a higher risk of damage than the middle. It is not intended to preclude use of alternative recording media where such constraints may not apply.~~

4. AIRBORNE IMAGE RECORDER (AIR) AND AIRBORNE IMAGE RECORDING SYSTEM (AIRS)

4.1 Start and stop logic

Editorial note.— Move paragraph 4.1.4 as new paragraph 4.1.

—4.1.4 The AIR or AIRS ~~must~~ shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS ~~must~~ 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.

4.1.4.2 Classes

4.1.1-2.1 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.

4.1.2-2.2 A Class B AIR or AIRS captures data link message displays.

4.1.3-2.3 A Class C AIR or AIRS captures instruments and control panels.

Note.— A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required.

—4.1.4 The AIR or AIRS ~~must start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS must 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.~~

5. DATA LINK RECORDER (DLR)

5.1 Applications to be recorded

5.1.1 Where the aircraft flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be

recorded on the aircraft. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall 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 in Table A2.3-2 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.

- Data link initiation capability
- Controller-pilot data link communications
- Data link flight information services
- Automatic dependent surveillance — contract
- Automatic dependent surveillance — broadcast*
- Aeronautical operational control*

— *Note.*— Descriptions of the applications are contained in Table A2.3-2.

6. AIRCRAFT DATA RECORDING SYSTEMS (ADRS)

6.1 Parameters to be recorded

ADRS shall be capable of recording, as appropriate to the aeroplane, at least the essential (E) parameters in Table A2.3-3.

6.2 Additional information

— 6.2.1 The measurement range, recording interval and accuracy of parameters on installed equipment is usually verified by methods approved by the appropriate certifying authority.

— 6.2.2 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.

7.6. INSPECTIONS OF FLIGHT RECORDER SYSTEMS

7.6.1 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.

7.6.2 FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording system 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 system 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.

~~7.3~~ **6.3** Recording system 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 analysis of the FDR or ADRS recording shall evaluate the quality of the recorded data to determine if the bit error rate (including those errors introduced by recorder, the acquisition unit, the source of the data on the aeroplane and by the tools used to extract the data from the recorder) is within acceptable limits and to determine the nature and distribution of the errors;
- c) ~~a complete flight recording from the~~ FDR or ADRS recording from a complete 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;
- d) 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;
- e) 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;
- f) 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
- g) 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.

~~7.4~~ **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.

~~7.5~~ **6.5** A report of the recording system inspection shall be made available on request to regulatory authorities for monitoring purposes.

~~7.6~~ **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 two years.

Table A2.3-1 Parameter guidance characteristics for 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 GPS-GNSS time sync)		24 hours	4	$\pm 0.125\%$ per hour/h	1-second s
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		95 km/h (50 kt) to max V_{S_0} (Note 1) V_{S_0} to 1.2 V_D (Note 2)	1	$\pm 5\%$ $\pm 3\%$	1 kt (0.5 kt recommended)
4	Heading (primary flight crew reference)		360°	1	$\pm 2^\circ$	0.5°
5	Normal acceleration (Note 3)		-3 g to +6 g	0.125	$\pm 1\%$ of maximum range excluding datum error of $\pm 5\%$	0.004 g
6	Pitch attitude		$\pm 75^\circ$ or usable range whichever is greater	0.25	$\pm 2^\circ$	0.5°
7	Roll attitude		$\pm 180^\circ$	0.25	$\pm 2^\circ$	0.5°
8	Radio transmission keying		On-off (one discrete)	1		
9	Power on each engine (Note 4 3)		Full range	1 (per engine)	$\pm 2\%$	0.2% of full range or the resolution required to operate the aircraft
10*	Trailing edge flap and cockpit control selection		Full range or each discrete position	2	$\pm 5\%$ or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft
11*	Leading edge flap and cockpit control selection		Full range or each discrete position	2	$\pm 5\%$ or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft
12*	Thrust reverser position		Stowed, in transit, and reverse	1 (per engine)		
13*	Ground spoiler/speed brake selection (selection and position)		Full range or each discrete position	1	$\pm 2\%$ unless higher accuracy uniquely	0.2% of full range

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
14	Outside air temperature		Sensor range	2	±2°C	0.3°C
15*	Autopilot/auto throttle/AFCS mode and engagement status		A suitable combination of discretises	1		
<i>Note.—The preceding 15 parameters satisfy the requirements for a Type II FDR.</i>						
16	Longitudinal acceleration (Note 3)		±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
17	Lateral acceleration (Note 3)		±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
18	Pilot input and/or control surface position-primary controls (pitch, roll, yaw) (Notes 3 and 5.4 and 8)	Application for type certification submitted to a Contracting State before 1 January 2016	Full range	0.25	±2° unless higher accuracy uniquely required	0.2% of full range or as installed
		Application for type certification submitted to a Contracting State on or after 1 January 2016	Full range	0.125	±2° unless higher accuracy uniquely required	0.2% of full range or as installed
19	Pitch trim position		Full range	1	±3% unless higher accuracy uniquely required	0.3% of full range or as installed
20*	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 150 m (500 ft) and ±5% above 150 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)
21*	Vertical beam deviation (ILS/GPS GNSS/GLS glide path MLS elevation, IRNAV/IAN vertical deviation)		Signal range	1	±3%	0.3% of full range
22*	Horizontal beam deviation (ILS/GPS GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation)		Signal range	1	±3%	0.3% of full range

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
23	Marker beacon passage		Discrete	1		
24	Master warning		Discrete	1		
25	Each NAV receiver frequency selection (Note-6.5)		Full range	4	As installed	
26*	DME 1 and 2 distance (includes distance to runway threshold (FLS) and distance to missed approach point (IRNAV/IAN) (Notes-6 and 7.5 and 6)		0-370 km (0-200 NM)	4	As installed	1 852 m (1 NM)
27	Air/ground status		Discrete	1		
28*	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)		Discrete	1		
29*	Angle of attack		Full range	0.5	As installed	0.3% of full range
30*	Hydraulics, each system (low pressure)		Discrete	2		0.5% of full range

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
31*	Navigation data (latitude/longitude, ground speed and drift angle) (Note-8.7)		As installed	1	As installed	
32*	Landing gear and gear selector position		Discrete	4	As installed	
<i>Note.—The preceding 32 parameters satisfy the requirements for a Type I FDR.</i>						
33*	Groundspeed		As installed	1	Data should be obtained from the most accurate system	1 kt
34	Brakes (left and right brake pressure, left and right brake pedal position)		(Maximum metered brake range, discrete or full range)	1	±5%	2% of full range
35*	Additional engine parameters (EPR, N ₁ , indicated vibration level, N ₂ , EGT, fuel flow, fuel cut-off lever position, N ₃ ; engine fuel metering valve position)	Engine fuel metering valve position: Application for type certification is submitted to a Contracting State on or after 1 January 2023	As installed	Each engine each second	As installed	2% of full range
36*	TCAS/ACAS (traffic alert and collision avoidance system)		Discrete(s)	1	As installed	
37*	Wind shear warning		Discrete	1	As installed	
38*	Selected barometric setting (pilot, co-pilot)		As installed	64	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
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) (course/DSTRK, path			1	As installed	As installed

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
	angle, final approach path (IRNAV/IAN))					
45*	Selected decision height		As installed	64	As installed	Sufficient to determine crew selection
46*	EFIS display format (pilot, co-pilot)		Discrete(s)	4	As installed	
47*	Multi-function/engine/alerts display format		Discrete(s)	4	As installed	
48*	AC electrical bus status		Discrete(s)	4	As installed	
49*	DC electrical bus status		Discrete(s)	4	As installed	
50*	Engine bleed valve position		Discrete(s)	4	As installed	
51*	APU bleed valve position		Discrete(s)	4	As installed	
52*	Computer failure		Discrete(s)	4	As installed	
53*	Engine thrust command		As installed	2	As installed	2% of full range
54*	Engine thrust target		As installed	4	As installed	2% of full range
55*	Computed centre of gravity		As installed	64	As installed	1% of full range
56*	Fuel quantity in CG trim tank		As installed	64	As installed	1% of full range
57*	Head-up display in use		As installed	4	As installed	
58*	Para-visual display on/off		As installed	1	As installed	
59*	Operational stall protection, stick shaker and pusher activation		As installed	1	As installed	
60*	Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer glide slope)		As installed	4	As installed	
61*	Ice detection		As installed	4	As installed	
62*	Engine warning each engine vibration		As installed	1	As installed	
63*	Engine warning each engine over temperature		As installed	1	As installed	

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
64*	Engine warning each engine oil pressure low		As installed	1	As installed	
65*	Engine warning each engine over speed		As installed	1	As installed	
66*	Yaw trim surface position		Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range
67*	Roll trim surface position		Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range
68*	Yaw or sideslip angle		Full range	1	±5%	0.5°
69*	De-icing and/or anti-icing systems selection		Discrete(s)	4		
70*	Hydraulic pressure (each system)		Full range	2	±5%	100 psi
71*	Loss of cabin pressure		Discrete	1		
72*	Cockpit trim control input position-pitch, Pitch		Full range	1	±5%	0.2% of full range or as installed
73*	Cockpit trim control input position-roll, Roll		Full range	1	±5%	0.2% of full range or as installed
74*	Cockpit trim control input position-yaw, Yaw		Full range	1	±5%	0.2% of full range or as installed
75	All cockpit flight control input forces (control wheel, control column, rudder pedal)		Full range (±311 N (±70 lbf), ±378 N (±85 lbf), ±734 N (±165 lbf))	1	±5%	0.2% of full range or as installed
76*	Event marker		Discrete	1		
77*	Date		365 days	64		
78*	Actual navigation performance or estimated position error or estimated position uncertainty		As installed	4	As installed	
<i>Note.—The preceding 78 parameters satisfy the requirements for a Type IA FDR.</i>						
79*	Cabin pressure altitude	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed (0 ft to 40 000 ft recommended)	1	As installed	100 ft
80*	Aeroplane computed	Application for type	As installed	64	As installed	1% of full

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
	weight	certification submitted to a Contracting State on or after 1 January 2023				range
81*	Flight director command (left flight director pitch command, left flight director roll command, right flight director pitch command, right flight director roll command)	Application for type certification submitted to a Contracting State on or after 1 January 2023	Full range	1	± 2°	0.5°
82*	Vertical speed	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed	0.25	As installed (32 ft/min recommended)	16 ft/min

Notes.—

1. V_{s_0} stalling speed or minimum steady flight speed in the landing configuration is in Section “Abbreviations and Symbols”.
2. V_D design diving speed.
3. ~~Refer to Chapter 2.4, 2.4.16.1.2.2, for increased recording requirements.~~
- 4-3. Record sufficient inputs to determine power.
- 5-4. For aeroplanes with control systems in which movement of a control surface will back drive the pilot’s control, “or” applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot’s control, “and” applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.
- 6-5. If signal available in digital form.
- 7-6. Recording of latitude and longitude from INS or other navigation system is a preferred alternative.
- 8-7. If signals readily available.
8. It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording intervals, accuracy limits or recording resolution guidance description detailed in this Appendix.

Editorial Note.— Delete paragraph below and move to 2.2.2 above.

If further recording capacity is available, recording of the following additional information should be considered:

- ~~— a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority:~~
 - ~~—— 1) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;~~
 - ~~—— 2) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY;~~
 - ~~—— 3) warnings and alerts;~~
 - ~~—— 4) the identity of displayed pages for emergency procedures and checklists;~~
- ~~— b) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.~~

Table A2.3-2. 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 data link 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

Item No.	Application type	Application description	Recording content
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 aeroplane are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	M*
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*

Key:

C: Complete contents recorded.

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

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

Table A2.3-3. Parameter guidance for aircraft data recording systems

No.	Parameter name	Parameter category	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
1	Heading:						
4	a) Heading (Magnetic or True)	R*	±180°	1	±2°	0.5°	* If Heading is preferred, if not available, record rates-yaw rate shall be recorded
	b) Yaw rate		±300°/s	0.25	±1% + drift of 360°/h	2°/s	
2	Pitch:						
2	a) Pitch attitude	E*	±90°	0.25	±2°	0.5°	* If Pitch altitude is preferred, if not available, record rates-pitch rate shall be recorded
	b) Pitch rate		300°/s	0.25	±1% + drift of 360°/h	2°/s	
3	Roll:						
3	a) Roll attitude	E*	±180°	0.25	±2°	0.5°	* If not available, record rates-roll rate shall be recorded
	b) Roll rate		300°/s	0.25	±1% + drift of 360°/h	2°/s	
4	Yaw rate	E*	±300°/s	0.25	±1% + drift of 360°/h	2°/s	* Essential if no heading available
5	Pitch rate	E*	±300°/s	0.25	±1% + drift of 360°/h	2°/s	* Essential if no pitch attitude available
6	Roll rate	E*	±300°/s	0.25	±1% + drift of 360°/h	2°/s	* Essential if no roll attitude available
7	Positioning system: latitude/longitude	E	Latitude: ±90° Longitude: ±180°	2 (1 if available)	As installed (0.00015° recommended)	0.00005°	
8	Positioning system estimated error	E*	Available range	2 (1 if available)	As installed	As installed	* If available
9	Positioning system:	E	-300 m (-1 000 ft)	2	As installed	1.5 m (5 ft)	

No.	Parameter name	Parameter category	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
	altitude		to maximum certified altitude of aircraft + 1 500 m (5 000 ft)	(1 if available)	(±15 m (±50 ft) recommended)		
10	Positioning system: time [±]	E	24 hours	1	±0.5 s	0.1 s	* UTC time preferred where available.
11	Positioning system: ground speed	E	0–1 000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
12	Positioning system: channel	E	0–360°	2 (1 if available)	As installed (±2° recommended)	0.5°	
4	Positioning system:						
	a) Time		24 hours	1	±0.5 s	0.1 s	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 certified altitude of aircraft + 1 500 m (5 000 ft)	2 (1 if available)	As installed (±15 m (±50 ft) recommended)	1.5 m (5 ft)	
	d) Ground speed		0–1 000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
	e) Track		0–360°	2 (1 if available)	As installed (±2° recommended)	0.5°	
	f) Estimated error		Available range	2 (1 if available)	As installed	As installed	Shall be recorded if readily available
13 5	Normal acceleration	E	–3 g to +6 g (*)	0.25 (0.125 if available)	As installed (±0.09 g excluding a datum error of ±0.45 g recommended)	0.004 g	
14 6	Longitudinal acceleration	E	±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	Parameter category	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
15 7	Lateral acceleration	E	±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	
16 8	External static pressure (or pressure altitude)	R	34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range	1	As installed (±1 mb or (0.1 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended)	0.1 mb (0.01 in-Hg) or 1.5 m (5 ft)	
17 9	Outside air temperature (or total air temperature)	R	-50° to +90°C or available sensor range	2	As installed (±2°C recommended)	1°C	
18 10	Indicated air speed	R	As the installed pilot display measuring system or available sensor range	1	As installed (±3% recommended)	1 kt (0.5 kt recommended)	
19 11	Engine RPM	R	Full range including overspeed condition	Each engine each second	As installed	0.2% of full range	
20 12	Engine oil pressure	R	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
21 13	Engine oil temperature	R	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
22 14	Fuel flow or pressure	R	Full range	Each engine each second	As installed	2% of full range	
23 15	Manifold pressure	R	Full range	Each engine each second	As installed	0.2% of full range	
24 16	Engine thrust/power/torque parameters required to determine propulsive thrust/power*	R	Full range	Each engine each second	As installed	0.1% of full range	* Sufficient parameters e.g. EPR/N ₁ or torque/N _p as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be

No.	Parameter name	Parameter category	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
							provided.
25 17	Engine gas generator speed (Ng)	R	0–150%	Each engine each second	As installed	0.2% of full range	
26 18	Free power turbine speed (Nf)	R	0–150%	Each engine each second	As installed	0.2% of full range	
27 19	Coolant temperature	R	Full range	1	As installed (±5°C recommended)	1°C	
28 20	Main voltage	R	Full range	Each engine each second	As installed	1 Volt	
29 21	Cylinder head temperature	R	Full range	Each cylinder each second	As installed	2% of full range	
30 22	Flaps position	R	Full range or each discrete position	2	As installed	0.5°	
31 23	Primary flight control surface position	R	Full range	0.25	As installed	0.2% of full range	
32 24	Fuel quantity	R	Full range	4	As installed	1% of full range	
33 25	Exhaust gas temperature	R	Full range	Each engine each second	As installed	2% of full range	
34 26	Emergency voltage	R	Full range	Each engine each second	As installed	1 Volt	
35 27	Trim surface position	R	Full range or each discrete position	1	As installed	0.3% of full range	
36 28	Landing gear position	R	Each discrete position*	Each gear every two seconds	As installed		* Where available, record up-and-locked and down-and-locked position
37 29	Novel/unique aircraft features	R	As required	As required	As required	As required	

Key:

E: Essential parameters

R: Recommended parameters

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Editorial note.— Insert new Attachment 2.C as follows:

ATTACHMENT 2.C GUIDE TO CURRENT FLIGHT RECORDER PROVISIONS

Supplementary to Chapter 2, 2.4.16

INTRODUCTION

Since 1973, and the inclusion in Annex 6 of SARPs for the carriage of flight recorders, the FLIRECP introduced new and revised requirements concerning flight recorders. These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings, and two-hour duration CVRs. Through the years, the applicability date and the carriage of recorder to be installed as defined by the SARPs were complex.

The tables below summarize the current flight recorders carriage requirements.

Table A2.C-1. SARPs for the recording of flight parameters

	MCTOM
Date	5 700 kg and below
	All turbine-engined aeroplanes with more than 5 passengers – first certificate of airworthiness
2016 ⇒	2.4.16.1.1.1

Table A2.C-2 CVR/CARS installation SARPs

	MCTOM
Date	5 700 kg and below
	All turbine-engined aeroplanes with more than 5 passengers required to be operated by more than 1 pilot – first certificate of airworthiness
2016 ⇒	2.4.16.2.1

End of new Attachment

SECTION 3. LARGE AND TURBOJET AEROPLANES

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CHAPTER 3.6 AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

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3.6.3 Flight recorders

3.6.3.1 Flight data recorders

3.6.3.1.1 ~~Operation~~ Applicability

3.6.3.1.1.1 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2005 shall be equipped with a ~~Type IA~~ an FDR which shall record at least 78 parameters listed in Table A2.3-1 of Appendix 2.3.

3.6.3.1.1.2 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with a ~~Type I~~ an FDR which shall record at least the first 32 parameters listed in Table A2.3-1 of Appendix 2.3.

3.6.3.1.1.3 **Recommendation.**— *All aeroplanes of a maximum certificated take-off mass of over 5 700 kg, up to and including 27 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, should be equipped with a ~~Type H~~ an FDR which should record at least the first 16 parameters listed in Table A2.3-1 of Appendix 2.3.*

3.6.3.2 Cockpit voice recorders

3.6.3.2.1 ~~Operation~~ Applicability

3.6.3.2.1.1 All turbine-engined aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2016 and required to be operated by more than one pilot shall be equipped with a CVR.

3.6.3.2.1.2 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 shall be equipped with a CVR.

3.6.3.2.1.3 **Recommendation.**— *All aeroplanes of a maximum certificated take-off mass of over 5 700 kg, up to and including 27 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1987, should be equipped with a CVR.*

3.6.3.2.2 Duration

3.6.3.2.2.1 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2021 shall be equipped with a CVR capable of retaining the information recorded during at least the last ~~twenty-five~~ 25 hours of its operation.

3.6.3.3 Combination recorders

Recommendation.— *All aeroplanes of a maximum certificated take-off mass over 5 700 kg, required to be equipped with an FDR and a CVR, may alternatively be equipped with two combination recorders (FDR/CVR).*

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CHAPTER 3.8 AEROPLANE MAINTENANCE*

3.8.1 Operator's maintenance responsibilities*

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3.8.5 Maintenance release

3.8.5.1 ~~A~~ ~~Until 4 November 2020,~~ a maintenance release shall be completed and signed, as prescribed by the State of Registry, to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures acceptable to the State of Registry.

3.8.5.1 As of 5 November 2020, when maintenance is carried out by an approved maintenance organization, the maintenance release shall be issued by the approved maintenance organization in accordance with the provisions of Annex 8, Part II, 6.8.

~~3.8.5.1-5.2~~ ~~A~~ ~~As of 5 November 2020,~~ when a maintenance is not carried out by an approved maintenance organization, the maintenance release shall be completed and signed, ~~as prescribed by the State of Registry,~~ by a person appropriately licensed in accordance with Annex 1 to certify that the maintenance work has been performed in accordance with the maintenance programme or other data and procedures acceptable to the State of Registry.

3.8.5.2 ~~A~~ ~~Until 4 November 2020,~~ a maintenance release shall contain a certification including:

- a) basic details of the maintenance performed;
- b) the date such maintenance was completed;
- c) when applicable, the identity of the approved maintenance organization; and
- d) the identity of the person or persons signing the release.

~~3.8.5.2-5.3~~ ~~A~~ ~~As of 5 November 2020,~~ when maintenance is not carried out by an approved maintenance organization, the maintenance release shall ~~contain a certification including~~ include the following:

- a) basic details of the maintenance performed;

* As of 5 November 2020, the following Chapter and section will be titled:
 Chapter 3.8 — *Aeroplane Continuing Airworthiness*
 Paragraph 3.8.1 — *Operator's Continuing Airworthiness Responsibilities.*

b) the date such maintenance was completed; and

~~c) when applicable, the identity of the approved maintenance organization; and~~

~~d) c)~~ the identity of the person or persons signing the release.

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CHAPTER 3.11 MANUALS, LOGS AND RECORDS

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3.11.1 Operator's maintenance control manual

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d) *until 4 November 2020, the methods used for the completion and retention of the operator's maintenance records required by 3.8.5;*

d) *as of 5 November 2020, the methods used for the completion and retention of the operator's ~~maintenance~~ continuing airworthiness records required by 3.8.5;*

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Editorial note.— Insert new Attachment 3.C as follows:

ATTACHMENT 3.C. GUIDE TO CURRENT FLIGHT RECORDER PROVISIONS

Supplementary to Chapter 3, 3.6.3

INTRODUCTION

Since 1973, and the inclusion in Annex 6 of SARPs for the carriage of flight recorders, the FLIRECP introduced new and revised requirements concerning flight recorders. These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings, and two-hour duration CVRs. Through the years, the applicability date and the carriage of recorder to be installed as defined by the SARPs were complex.

The tables below summarize the current flight recorders carriage requirements.

Table 3.C-1. SARPs for the recording of flight parameters

Date	MCTOM			
	Over 27 000 kg		Over 5 700 kg	
	All aeroplanes new type certificate	All aeroplanes first certificate of airworthiness	All aeroplanes new type certificate	All aeroplanes first certificate of airworthiness
1989 ⇒		3.6.3.1.1.2		3.6.3.1.1.3
2005 ⇒		3.6.3.1.1.1		3.6.3.1.1.1
2016 ⇒		Table A2.3-1 (Some parameters are sampled at an increased frequency)		
2023 ⇒	3.6.3.2.1.4	3.6.3.2.1.5	3.6.3.2.1.4	3.6.3.2.1.5

Table 3.C-2. CVR/CARS installation SARPs

Date	MCTOM		
	Over 27 000 kg	Over 5 700 kg	
	All aeroplanes first certificate of airworthiness	All aeroplanes first certificate of airworthiness	All turbine-engined aeroplanes operated by more than one pilot new type certificate
1987 ⇒	3.6.3.2.1.2	3.6.3.2.1.3	
2016 ⇒			3.6.3.2.1.1
2021 ⇒	3.6.3.2.2.1		

Table 3.C-3. Combination recorder installation SARPs

MCTOM
Over 5 700 kg
All aeroplanes requiring an FDR and a CVR
3.6.3.3

End of new Attachment

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