European Union Aviation Safety Agency

Opinion No 02/2019

Review of the aeroplane performance requirements for air operations

RELATED NPA/CRD: 2016-11 — RMT.0296 (OPS.008(a))

Recorders installation and maintenance thereof — certification aspects: *alternate power supply for cockpit voice recorders*

RELATED NPA/CRD: 2018-03 — RMT.0249 (MDM.051)

In-flight recording for light aircraft

RELATED NPA/CRD: 2017-03 — RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b))

Non-ETOPS operations with performance class A aeroplanes with a maximum operational passenger seating configuration of 19 or less

RELATED NPA/CRD: 2017-15 — RMT.0695

EXECUTIVE SUMMARY

The objective of this Opinion is to:

— improve the availability of data that is recorded by cockpit voice recorders (CVRs);
— address the need for in-flight recording for light aircraft further to 12 safety recommendations (SRs) addressed to EASA and the recently adopted ICAO Standards on the matter;
— ensure a level playing field for the commercial operation of certain categories of aeroplanes without an ETOPS approval over routes that contain a point further from an adequate aerodrome than the distance flown in 60 minutes at one-engine-inoperative cruising speed ('non-ETOPS operations'); it also addresses the recently adopted ICAO Standards for the installation of reinforced cockpit doors;
— improve safety in relation to runway surface condition reporting and in-flight assessment of landing performance further to SRs and the recently adopted ICAO Standards; and
— ensure a level playing field in relation to the required landing distance for certain categories of commercially operated aeroplanes.

This Opinion proposes to:

— mandate the carriage of lightweight flight recorders for certain categories of light aircraft that are commercially operated and to promote the voluntary installation of such recorders on other aircraft;
— remove the current mass threshold for 'non-ETOPS' operations, the type design requirement for the 120–180-minute non-ETOPS operations with turbojet aeroplanes, and increase the mass limit requiring a reinforced cockpit door for certain categories of aeroplanes;
— require the installation of an alternate power supply of the CVRs and associated cockpit-mounted area microphone installed on certain large aeroplanes;
— introduce standards for runway surface condition reporting, landing performance at time of arrival as well as a reduced required landing distance for CAT operations with certain categories of aeroplanes.

The proposed amendments are expected to:

— increase safety and ensure alignment with ICAO with regard to in-flight recording;
— maintain the current level of safety for non-ETOPS operations, while allowing Europe to achieve harmonisation with other regulatory systems;
— increase the current level of safety in relation to aeroplane performance, and ensure alignment with ICAO and better harmonisation with the FAA on the matter.

Action area:	Runway safety; aircraft tracking, rescue operations and accident investigation;
Affected rules:	Annex I (Definitions), Annex II (Part-ARO), Annex III (Part-ORO), Annex IV (Part-CAT), Annex VI (Part-NCC), Annex VII (Part-NCO) and Annex VIII (Part-SPO) to Commission Regulation (EU) No 965/2012
Affected stakeholders:	Aeroplane operators; air operators (CAT); production organisation approval (POA) holders; competent authorities
Driver:	Safety; level playing field **Rulemaking group:** RMT.0296: Yes; RMT.0249: No; RMT.0271/0272: Yes; RMT.0695: SLRT Group
Impact assessment:	RMT.0296 and RMT.0271/0272: full; RMT.0249 and RMT.0695: light **Rulemaking Procedure:** Standard

RMT.0296: 9.6.2015 RMT.0249: 27.1.2016 RMT.0271/0272: 25.7.2014 RMT.0695: 15.12.2015	30.9.2016 27.3.2018 3.4.2017 25.9.2017	21.2.2019	2021/Q1	2021/Q1

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1. About this Opinion

1.1. How this Opinion was developed

The European Union Aviation Safety Agency (EASA) developed this Opinion in line with Regulation (EU) 2018/1139[1] ('Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking activity is included in the European Plan for Aviation Safety (EPAS)[3] under rulemaking tasks RMT.0249 (MDM.051), RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)), RMT.0296 (OPS.008(a)), and RMT.0695. The scope and timescales of each task were defined in the related ToRs[4].

The *draft* text of this Opinion has been developed:

— for RMT.0249 (MDM.051):

by EASA. All interested parties were consulted through NPA 2018-03[5,6]. 5 comments were received from interested parties, including industry and national aviation authorities (NAAs).

EASA has addressed and responded to the comments received on the NPA regarding the proposed amendments to Commission Regulation (EU) No 965/2012[7]. The comments received and EASA's responses to them are presented in Comment-Response Document (CRD) 2018-03[8] and are summarised in Section 2.4 below;

— for RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)):

by EASA based on the input of the RMT.0271 (MDM.073) Rulemaking Group (RMG). All interested parties were consulted through NPA 2017-03[9,10]. 108 comments were received from interested parties, including industry, NAAs, air accident investigation authorities, aircraft and equipment manufacturers, and airline and pilot associations.

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1 Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139).

2 EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure).

3 https://www.easa.europa.eu/document-library/general-publications?publication_type%5B%5D=2467

4 https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0249-mdm051
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0271-0272-mdm073-b
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0296-ops008a
https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0695

5 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2018-03

6 In accordance with Article 115 of Regulation (EU) 2018/1139, and Articles 6(3) and 7 of the Rulemaking Procedure.

7 Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1).

8 http://easa.europa.eu/document-library/comment-response-documents

9 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2017-03

10 In accordance with Article 115 of Regulation (EU) 2018/1139, and Articles 6(3) and 7 of the Rulemaking Procedure.

EASA has addressed and responded to the comments received on the NPA with the support of the RMT.0271 Review Group (RG). The comments received and EASA's responses to them are presented in CRD 2017-03[11] and are summarised in Section 2.4 below.

— for RMT.0296 (OPS.008(a)):

by EASA based on the input of the RMT.0296 (OPS.008(a)) Rulemaking Group (RMG). All interested parties were consulted through NPA 2016-11[12,13]. 357 comments were received from interested parties, NAAs, aircraft operators, aircraft manufacturers and organisations.

EASA has addressed and responded to the comments received on the NPA with the support of the RMT.0296 RG. The comments received and EASA's responses to them are presented in CRD 2016-11[14] and are summarised in Section 2.4 below;

— for RMT.0695:

This RMT has been outsourced to a stakeholder-led rulemaking task (SLRT) group in accordance with EASA's Rulemaking Procedure. EASA uses SLRTs to address industry-driven issues that cannot be prioritised as part of EASA's rulemaking programmes due to resource constraints.

The outsourcing of this RMT is supported by the limited applicability of the proposed amendments.

All interested parties were consulted through NPA 2017-15[15,16]. 23 comments were received from interested parties, including industry and NAAs.

Based on the proposals of the SLRT group, EASA has addressed and responded to the comments received on the NPA. The comments received and the EASA responses to them are presented in CRD 2017-15[17] and are summarised in Section 2.4 below.

The *final* text of this Opinion and the draft regulation has been developed as follows:

— for RMT.0249 (MDM.051):

by EASA;

— for RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)):

by EASA based on the input of the RMT.0271 RG;

— for RMT.0296 (OPS.008(a)):

by EASA based on the input of the RMT.0296 RG;

— for RMT.0695*:*

by EASA based on the input of the SLRT group.

11 http://easa.europa.eu/document-library/comment-response-documents

12 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2016-11

13 In accordance with Article 115 of Regulation (EU) 2018/1139, and Articles 6(3) and 7 of the Rulemaking Procedure.

14 http://easa.europa.eu/document-library/comment-response-documents

15 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2017-15

16 In accordance with Article 115 of Regulation (EU) 2018/1139, and Articles 6(3) and 7 of the Rulemaking Procedure.

17 http://easa.europa.eu/document-library/comment-response-documents

The draft rule text proposed by EASA is published on the EASA website[18].

The major milestones of this rulemaking activity are presented on the title page.

1.2. The next steps

This Opinion contains the proposed amendments to Commission Regulation (EU) No 965/2012 and their potential impacts. It is submitted to the European Commission to be used as a technical basis in order to prepare an EU regulation.

The decision that contains the related certification specifications (CS), acceptable means of compliance (AMC) and guidance material (GM) will be published by EASA when the related regulation is adopted by the European Commission/European Parliament and the Council.

EASA published the draft text for the related ED Decision that contains AMC and GM for information purposes only. The final decision that amends the AMC & GM will be published by EASA once the European Commission has adopted the related regulation.

[18] http://easa.europa.eu/document-library/opinions

2. In summary — why and what

2.1. Why we need to change the rules — issue/rationale

RMT.0249 (MDM.051) 'Alternate power supply for cockpit voice recorders (CVRs)'

Safety investigation authorities found during the investigations of accidents that CVRs had been depowered prematurely while they could have kept recording useful information, provided that an alternate power source had been installed.

They addressed safety recommendations (SRs) to EASA on the issue of CVR/flight data recorder (FDR) functions being disabled after an interruption of normal power. The following SRs were considered during this RMT:

SR CAND-1999-003: 'As of 01 January 2005, for all aircraft equipped with CVRs having a recording capacity of at least two hours, a dedicated independent power supply be required to be installed adjacent or integral to the CVR, to power the CVR and the cockpit area microphone for a period of 10 minutes whenever normal aircraft power sources to the CVR are interrupted.' (Accident to McDonnell Douglas MD11, registered HB-IWF, on 02 September 1998)

SR UNKG-2005-075: 'For newly manufactured aircraft, the European Aviation Safety Agency should require that the cockpit voice recorder and cockpit area microphone are provided with an independent 10 minute back-up power source, to which the cockpit voice recorder and cockpit area microphone are switched automatically, in the event that normal power is interrupted.' (Serious incident on an Airbus A320-214, registered G-BXKD, on 15 January 2005)

ICAO Annex 6 Part I, in its Standards and Recommended Practices (SARPs) requires that 'all aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness (CofA) is first issued on or after 1 January 2018 should be provided with an alternate power source, as defined in 6.3.2.4.1, that powers at least one CVR'.

RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)) 'In-flight recording for light aircraft'

In the context of this RMT, the following terms are used:

— 'light aeroplane' means an aeroplane of a maximum certified take-off mass (MCTOM) of 5 700 kg or less;

— 'light helicopter' means a helicopter of an MCTOM of 3 175 kg or less;

— 'light aircraft' means a light aeroplane, a light helicopter, a balloon or a sailplane.

Since 2010, accidents and serious incidents that occur over the territory of an EASA Member State (MS) must be subject to safety investigation. However, almost all categories of light aircraft fall outside the scope of current requirements to carry flight recorders. In the absence of data on the aircraft condition and operation, it can be very difficult to reconstruct the sequence of events that led to an accident or a serious incident — knowing the sequence of events though is essential for defining actions in order to prevent future occurrences.

This is why the recently adopted Standards in ICAO Annex 6 prescribe, for some categories of light aeroplanes and helicopters operated for commercial air transport (CAT), the carriage of in-flight recording equipment. In addition, 12 SRs related to in-flight recording for light aeroplanes and helicopters were addressed to EASA by safety investigation authorities.

Four systematic studies of safety investigation reports were conducted by EASA in order to assess the expected benefit of in-flight recording for preventing accidents through facilitation of safety investigations (refer to NPA 2017-03, Appendix E[19]). The conclusion of these studies is that in-flight recording brings moderate benefit when considering light aircraft, so that requirements applicable to all kinds of light aircraft would not be proportionate. Hence, rulemaking should be focused on those light aircraft that are used for commercial operations and are capable of transporting several passengers.

Besides rulemaking, the potential safety benefit of facilitating and promoting voluntary installation of in-flight recording equipment was also identified.

RMT.0296 (OPS.008(a)) 'Review of the aeroplane performance requirements for air operations'

Investigations of accidents indicate that the standards for runway surface condition assessment and reporting are not harmonised and have recognised this fact as a significant contributing factor to runways excursions, in particular when the runway is wet or contaminated.

The standards for aeroplane performance calculations do not cover adequately all conditions on wet and contaminated runways in relation to the method used for assessing and reporting the runway surface condition.

ICAO has consequently amended a number of SARPs in several of its annexes, namely Annex 6, 8, 14 and 15, and has produced extensive guidance material in order to establish a globally harmonised reporting format for runway surface condition, airworthiness standards on performance data necessary for the assessment of the landing distance for aeroplanes at the time of landing, and operational provisions for the flight crew on landing performance calculations and runway condition reporting.

Commission Regulation (EU) No 965/2012 needs therefore to be amended to implement the applicable ICAO SARPs on runway surface condition assessment and reporting and aeroplane performance requirements.

Furthermore, a need for operational flexibility has been identified in certain CAT operations with regard to the required landing distance. Certain performance class A and class B aeroplanes are allowed in other regulatory systems to land within 80 % of the landing distance available on the intended runway, provided that they are granted a prior approval from the competent authority and that they fulfil a number of risk-mitigating conditions. Commission Regulation (EU) No 965/2012 needs to be amended in this regard as well to define the conditions under which these operations may be conducted, while attaining a level of safety that is equivalent to that attained by the existing requirements for landing performance.

Other miscellaneous amendments are necessary to clarify the applicability and use of crosswind limitations, and improve technical accuracy, clarity and consistency.

This Opinion also responds to the following SRs addressed to EASA:

— EAPPRE, Ref.: 3.7.1;

— EAPPRE, Ref.: 3.7.3; and

[19] https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2017-03

— SR NORW-2011-011.

The details of the responses to each SR may be found in Section 2.3 of the NPA 2016-11.

RMT.0695 'Non-ETOPS operations'

The requirements for performance class A aeroplanes with a maximum operational passenger seating configuration (MOPSC) of 19 or less to conduct ETOPS operations were developed by the Joint Aviation Authorities (JAA) in parallel with the US Federal Aviation Administration's (FAA) Aviation Rulemaking Advisory Committee (ARAC) in the mid-1990s.

The MCTOM threshold and the diversion time threshold at which ETOPS approval is required for operators of such aeroplanes are today specified in CAT.OP.MPA.140 of Annex IV to Regulation (EU) No 965/2012.

The current 45 360 kg applicability mass threshold affects primarily turbojet aeroplanes, as there is currently no civilian turboprop aeroplane with MCTOM close to or above 45 360 kg operated in CAT in Europe. This threshold was established based on an analysis of business aeroplanes produced in the mid-1990s, but today several manufacturers develop intercontinental turbojet aeroplanes for business travel, i.e. 'business jets', that have an MCTOM in excess of 45 360 kg. While the operation of these aeroplanes is unchanged from similar aeroplanes with an MCTOM at or below the current threshold, the additional mass would require these operators to obtain an ETOPS approval for the same routes, when operating in CAT.

— This 45 360 kg threshold, therefore, distorts the level playing field since it introduces an additional burden on CAT operators of twin-engined aeroplanes with an MCTOM at or above 45 360 kg and an MOPSC of 19 or less, in relation to CAT operators of similar aeroplanes but with an MCTOM below 45 360 kg.

— In addition, there is also a harmonisation issue as no such mass threshold is defined in the regulatory frameworks of the FAA or Transport Canada Civil Aviation (TCCA). Furthermore, the FAA and TCCA regulatory provisions do not require a specific type design approval for non-ETOPS operations whereas CAT.OP.MPA does require one for 120–180-minute non-ETOPS operations with performance class A aeroplanes with an MOPSC of 19 or less and an MCTOM less than 45 360 kg.

Indeed, the FAA in its 14 CFR Part 135 accommodates non-ETOPS operations below 180 minutes with such aeroplanes and for on-demand operations, while no such alleviation exists for other types of CAT operations that fall under FAA Part 121. Similarly, the TCCA requirement for an approval to conduct ETOPS operations with two-engined aeroplanes is only applicable to aeroplanes with an MOPSC of 20 or more.

Neither is such a mass threshold defined in Amendment 38 to ICAO Annex 6 Part I, which renamed ETOPS to 'extended diversion time operations (EDTO)' and introduced significant technical changes to the concept. The ICAO provisions require only the Contracting States to the Chicago Convention to define a threshold time per aeroplane type, above which an EDTO approval would be required, and guidance to Contracting States is provided for the establishment of this threshold time. It is worth noting that this threshold time may be specific to the particular aeroplane type and/or operator.

In the context of this RMT, EASA also decided to consider Amendment 43[20] to ICAO Annex 6 Part I, adopted by the ICAO Council in 2018. This Amendment contains a standard to increase the mass threshold above which a reinforced secure cockpit door is required for passenger-carrying aeroplanes used in CAT operations. The new standard allows aeroplanes that have an MOPSC of 19 seats or less and an MCTOM above 45 500 kg, but less than 54 500 kg, to operate without a reinforced cockpit door.

2.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 1 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Section 2.1.

The specific objectives of this proposal are, therefore:

— for RMT.0249 (MDM.051):

to increase the robustness of CVRs following the loss of their power supply;

— for RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)):

- to enhance the identification and prevention of safety issues that affect light aircraft by means of data recorded in flight;
- to achieve better harmonisation with the ICAO Standards in Annex 6, Parts I, II and III;
- to produce a proportionate regulation which takes into account the General Aviation Road Map; and
- to identify avenues other than rulemaking for the installation of in-flight recording equipment;

— for RMT.0296 (OPS.008(a)):

- to reduce the number of accidents and serious incidents where aeroplane performance is a causal factor;
- to achieve better harmonisation with ICAO Standards in Annex 6, Parts I and II;
- to provide improved clarity, technical accuracy, flexibility or a combination of these benefits for the EU operational requirements on aeroplane performance; and
- to contribute to the global harmonisation of regional, notably the FAA, and EU operational requirements on aeroplane performance in support of CAT operations;

— for RMT.0695:

to determine how the European regulatory framework needs to be updated in order to accommodate new business jet aeroplanes that are operated by European CAT operators in the 180-minute non-ETOPS operation category, in order to:

[20] See ICAO State Letter AN 11/1.1.32-17/66 (EASA reference SL 2018/12) of 29 May 2017.

- increase harmonisation with the regulatory framework of other major aviation authorities for the operation of these aeroplanes and, therefore, ensure a level playing field between EU and third-country operators; and
- ensure a level playing field among CAT operators of aeroplanes with an MOPSC below 19, and avoid an undue burden on European CAT operators of business jet aeroplanes,

and to allow CAT operations of passenger-carrying aeroplanes that have an MOPSC of 19 seats or less and an MCTOM above 45 500 kg, but less than 54 500 kg, without a reinforced cockpit door.

2.3. How we want to achieve it — overview of the proposals

RMT.0249 (MDM.051) 'Alternate power supply for cockpit voice recorders (CVRs)'

This Opinion proposes to introduce a provision in point CAT.IDE.A.185 of Annex IV (Part-CAT) to Commission Regulation (EU) No 965/2012 to require an alternate power source for CVRs and cockpit-mounted area microphones of newly manufactured aeroplanes with an MCTOM of over 27 000 kg.

RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)) 'In-flight recording for light aircraft'

<u>New concepts and definitions</u>

The term 'flight recorder' was implicitly used in the rules for air operations to designate crash-protected flight recorders that are required to be carried on-board large aircraft, such as the flight data recorder (FDR) or the cockpit voice recorder (CVR). Crash-protected flight recorders are capable of withstanding very severe crash conditions and they can record a wealth of data from multiple sensors and sources. However, in the recent amendments to ICAO Annex 6, the term 'flight recorder' encompasses lightweight equipment as well, which meets less demanding crash-protection requirements and records a smaller set of data.

Hence, the definition of 'flight recorder' is introduced for clarification in Annex I (Definitions) to Regulation (EU) No 965/2012. This definition complies with the concept used in ICAO Annex 6. It is also consistent with the definition of a flight recorder in Regulation (EU) No 996/2010[21]. As a consequence, the provisions applicable to the preservation of the recordings after an accident or a serious incident (CAT.GEN.MPA.105(a)(10), CAT.GEN.MPA.195(a), NCC.GEN.106(a)(9), NCC.GEN.145(a), SPO.GEN.107(a)(9), and SPO.GEN.145(a)) become de facto applicable to the recordings of lightweight flight recorders as well.

In addition, definitions for 'flight data recorder' and 'cockpit voice recorder' are introduced in order to provide a clear understanding of these types of flight recorders and avoid confusion with lightweight flight recorders.

<u>New recording requirements for commercial operations with light aeroplanes and light helicopters</u>

New requirements are added to Annex IV (Part-CAT: points CAT.IDE.A.191 and CAT.IDE.H.191) and Annex VIII (Part-SPO: points SPO.IDE.A.146 and SPO.IDE.H.146) to Regulation (EU) No 965/2012. They require that aeroplanes and helicopters that:

[21] Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC (OJ L 295, 12.11.2010, p. 35).

— are used for commercial operations;

— are manufactured on or after the date of entry into force of the amending regulation + 3 years;

— are not specified by the current flight data recorder carriage requirements (points CAT.IDE.A.190, CAT.IDE.H.190, SPO.IDE.A.145, SPO.IDE.H.145); and

— have an MOPSC of more than 9 (for aeroplanes) or are turbine-engined with an MCTOM of 2 250 kg or more (for aeroplanes and helicopters),

be equipped with a flight recorder, which may be either crash-protected or lightweight.

They also require that the flight recorder record flight data or images that are sufficient to determine the flight path and aircraft speed. Indeed, lightweight flight recorder models available on the market record, as a minimum, images of the aircraft instruments, or 3D-position and acceleration data provided by dedicated GNSS receiver and accelerometric sensors; in both cases, the recorded information is sufficient to determine the flight path and aircraft speed.

A minimum recording duration of 5 hours is required in order to ensure that the flight recorder is capable of recording a complete flight in most cases. Indeed, the majority of aeroplane and helicopter models to which the proposed rules apply have a flight endurance of less than 5 hours, and even those models with an endurance that exceeds 5 hours seldom perform commercial flights of such a long duration.

The flight recorder is required to have an automatic start-and-stop logic in order to ensure recording as soon as the aeroplane is capable of moving under its own power. In practice, it is sufficient for the flight recorder to be capable of detecting when an aircraft engine delivers power.

If the flight recorder records images or audio of the flight crew compartment, then a function must be provided which can be operated by the commander in order to modify the image or audio recordings so that they cannot be retrieved using normal replay or copying techniques. This is to allow the flight crew to protect their privacy by making the image or audio recordings inaccessible using normal techniques after an uneventful flight. The decision to activate this function is to be made by the commander because they are responsible for the preservation of flight recorder recordings (refer to CAT.GEN.MPA.105). However, this function does not erase recorded data: it can still be retrieved using special techniques that are available to equipment manufacturers and/or safety investigation authorities. This is consistent with the specifications of ED-155 for the recording of images (refer to ED-155, Part III 'Airborne Image Recording Systems', paragraph III-2.1.11) and also prescribed by a standard[22] adopted in Appendix 8 of ICAO Annex 6 Part I (Eleventh Edition, Amendment 43, applicable on 8 November 2018).

Continued serviceability of the flight recorder

Paragraph (b) of CAT.GEN.MPA.195 and paragraph (b) of SPO.GEN.145 are amended in order to address the continued serviceability of the flight recorder, which is required by the new CAT.IDE.A.191, CAT.IDE.H.191, SPO.IDE.A.146, and SPO.IDE.H.146.

[22] 'for 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.'

Indeed, experience with crash-protected flight recorders installed on large aircraft has shown that without rules, the continued serviceability of the flight recorders is not addressed consistently. The instructions for continued serviceability vary — in particular, they do not always include inspection of the recorded data (i.e. checking that the values of flight parameters are reasonable and consistent with each other, and that images are of sufficient quality to be able to read instrument indications). In addition, since a flight recorder failure has no effect on the safe conduct of the flight, maintaining it serviceable it is not considered to be a priority if it is not required by law.

In summary, two kinds of checks are expected to be performed on lightweight flight recorders:

— inspection of the recording to check the quality and completeness of the recorded data (already applicable to crash-protected flight recorders and required for lightweight flight recorders); and

— daily use of the means for preflight check of the flight recorders for proper operation (already applicable to crash-protected flight recorders and required for lightweight flight recorders).

The changes in paragraph (b) also clarify that the requirements apply only to flight recorders which are required to be installed, not to those which are installed on a voluntary basis. Voluntary installation of recording equipment should entail minimum operational constraints and maintenance costs of installed equipment, regardless of the type of operations performed as per NPA 2017-03, Section 4.5.1, Option A.1:

'4) The operational constraints and maintenance cost of installed equipment should be as low as possible. A fit-and-forget approach should be made possible. The equipment should also not be required to be maintained serviceable when it is installed on a voluntary basis, as this would work against promotion. This in return may affect the availability and consequently the safety benefits of the equipment.'

Paragraph (d) of CAT.GEN.MPA.195 and paragraph (d) of SPO.GEN.145 are amended to include lightweight flight recorders in the requirement to keep and maintain documentation needed to convert recorded data into parameters expressed in engineering units.

The same changes have been made also to the related requirements in Annex VI (Part-NCC), namely point NCC.GEN.145, in order to cover the situations in which the same aircraft is used for both NCC and CAT and/or SPO operations.

<u>Protection of image and audio recordings from a flight recorder</u>

Since compliance with CAT.IDE.A.191, CAT.IDE.H.191, SPO.IDE.A.146 and SPO.IDE.H.146 may be achieved by recording images of the flight crew compartment, and since crew members may appear entirely or partly on these images, the framework for the protection of image recordings was modified.

<u>Requirements regarding the handling of audio and image recordings</u>

Paragraph (f) of CAT.GEN.MPA.195 and paragraph (f) of SPO.GEN.145 have been amended in order to address the protection of such image recordings. In addition, since a lightweight flight recorder might be capable of recording audio in the flight crew compartment, all audio recordings from a flight recorder (and not only CVR recordings) are now within the scope of paragraph (f) of CAT.GEN.MPA.195 and paragraph (f) of SPO.GEN.145.

Rules to frame the handling of image and audio recordings are as laid down in Standard 6.1 of Appendix 3 to ICAO Annex 19 (Second Edition, applicable on 7 November 2019): 'States shall, through national laws and regulations, provide specific measures of protection regarding the confidentiality and access by the public to ambient workplace recordings.'

In addition, a Standard[23] that restricts the use of audio and airborne image recordings was included in Chapter 3 of ICAO Annex 6 Part I (Eleventh Edition, Amendment 43, applicable on 8 November 2018) and Part II (Tenth Edition, Amendment 36, applicable on 8 November 2018). The proposed requirements in paragraphs (f)(3) and (f)(3a) of points CAT.GEN.MPA.195, NCC.GEN.145 and SPO.GEN.145 respectively implement this ICAO Standard for airborne image recordings.

Hence, the following principles are proposed:

— If images of the flight crew compartment contain parts of the bodies of crew members, they could be considered personal data. In that case, European operators will have to comply with Regulation (EU) 2016/679[24] on General Data Protection (applicable from 25 May 2018). Therefore, reference to this Regulation is added, besides the reference to Regulation (EU) No 996/2010, in paragraph (f) to each of the above-mentioned points.

— Audio and images of the flight crew compartment recorded by a flight recorder may not be used for purposes other than:

  - those stipulated in Regulation (EU) No 996/2010;
  - maintaining or improving safety; or
  - ensuring flight recorder serviceability.

— When audio and images of the flight crew compartment recorded by a flight recorder are used for maintaining or improving safety, then:

  - a procedure for the handling of audio and/or image recordings shall be in place; and
  - all crew members concerned shall give their prior consent.

— When audio and/or images of the flight crew compartment recorded by a flight recorder are used for ensuring the serviceability of this flight recorder,

  - the operator shall ensure the privacy of these audio and/or image recordings (except if there is no body part of crew members visible on the images); and
  - these images shall not be disclosed or used for purposes other than ensuring flight recorder serviceability.

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[23] Text of this ICAO Standard:
'As of November 2019, States shall not allow the use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident as per Annex 13 except where the recordings or transcripts:
a) are related to a safety-related event identified in the context of a safety management system; are restricted to the relevant portions of a de-identified transcript of the recording; and are subject to the protections accorded by Annex 19;
b) are sought for use in criminal proceedings not related to an event involving an accident or incident investigation and are subject to the protections accorded by Annex 19; or
c) are used for inspections of flight recorder systems as provided in Section 7 of Appendix 8.'

[24] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1) (http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679&qid=1487864197230&from=EN).

In that case, it is not practical to request each time the prior consent of the crew. However, if such a recording is inspected for serviceability purposes, it shall not be disclosed or used for other purposes.

The same changes have been made also to the related rules for non-commercial operations with complex motor-powered aircraft (paragraph (f) of NCC.GEN.145) in order to cover the situations in which the same aircraft is used for both NCC and CAT and/or SPO operations. Since the protection of audio and image recordings introduced in paragraph (f) of CAT.GEN.MPA.195 and of SPO.GEN.145 are relevant for all types of operation, the gap between the different annexes applicable to CAT, SPO and NCC operations had to be bridged.

Note:

Paragraphs (f)(3) and (f)(3a) of CAT.GEN.MPA.195, NCC.GEN.145 and SPO.GEN.145 respectively only address images of the flight crew compartment that are recorded by a flight recorder. Hence, images of other parts of the aircraft are not within the scope of these paragraphs. In addition, images captured 'at the back' of electronic flight instrument displays (reproducing an exact copy of the information presented on the display) are not within their scope either. Also, images that are recorded by a portable electronic device (PED) or a system of the aircraft which is not a flight recorder are not within their scope either.

Function to erase image and audio recordings

New points CAT.IDE.A.191, CAT.IDE.H.191, SPO.IDE.A.146 and SPO.IDE.H.146 require that if the flight recorder records images or audio of the flight crew compartment, a function must be provided that would enable the commander to modify the recording after an uneventful flight, in a way that renders the recording impossible to be replayed or copied, as a measure to protect crew privacy. See also Section 2.3.1.2.

Promotion of in-flight recording

The retained options include promoting the benefit of recording flight parameters, images and audio in the flight crew compartment, and promoting voluntary installation of recording equipment on all light aeroplanes and helicopters. It is expected that these promotional activities will contribute to increasing the number of operators and aircraft owners that voluntarily install in-flight recording equipment.

Appendix D of NPA 2017-03 presents the potential benefits that could be promoted to industry and identifies factors that may limit the effectiveness of any future promotion activity.

RMT.0296 (OPS.008(a)) 'Review of the aeroplane performance requirements for air operations'

This Opinion proposes the following amendments to several annexes of Commission Regulation (EU) No 965/2012.

Annex I 'Definitions'

The definitions of 'dry runway', 'wet runway' and 'contaminated runway' are amended in accordance with the definitions introduced in ICAO Annex 6 and 14.

The definition of 'damp runway' is deleted as this condition is now included in the definition of 'wet runway'.

The following new definitions are added to support the proposed runway surface condition assessment and reporting system:

— ‘runway condition assessment matrix (RCAM)’;

— ‘runway condition report (RCR)’;

— ‘runway condition code (RWYCC)’;

— ‘runway surface condition(s)’;

— ‘landing distance at time of arrival (LDTA)’;

— ‘runway surface descriptors’;

— ‘slippery wet runway’;

— ‘specially prepared winter runway’.

Annex II (Part-ARO)

In Appendix II, note 20 to the OPERATIONS SPECIFICATIONS form (EASA FORM 139) is amended to include under the listed items the approval for reduced required landing distance operations in order to be consistent with the proposed new CAT.POL.A.255 and CAT.POL.A.355 that regulate such operations.

Annex IV (Part-CAT)

A requirement for a specific in-flight assessment of the landing distance at time of arrival (LDTA) is added to CAT.OP.MPA.300 in accordance with ICAO Annex 6.

For clarity reasons, the following amendments are also proposed:

— The rule previously applicable to both aeroplanes and helicopters is split in two different requirements. The content of the new CAT.OP.MPA.301 applicable to helicopters only has not been changed compared to the current rule.

— The details of the in-flight assessment of the LDTA are proposed in a new dedicated rule because the current CAT.OP.MPA.300 serves also other purposes than checking the landing distances, such as checking the weather minima. In this regard, it should be noted that said rule is being revised for other reasons under the ongoing RMT.0379 ‘All-weather operations (AWO)’. However, no conflict exists with the amendment proposed in this Opinion.

The details of the new requirement on the assessment of the LDTA are developed in new CAT.OP.MPA.303. In particular, a different approach is taken for various categories of aeroplanes as follows:

— Performance class A aeroplanes:

  the TALPA ARC recommends the application of a 15 % factor to the landing distance determined in accordance with performance data for the LDTA. However, further to comments to NPA 2016-11, the applicability was restricted to those aeroplanes that are certified in accordance with CS-25 or CS-23 at level 4/‘High speed’.

— Performance class B and class C aeroplanes:

in consideration of the fact that in many cases data from the manufacturer may not be available for this category of aeroplanes as no relevant airworthiness standards may exist, the proposed new rule allows, as a minimum, to ensure that the landing distance calculated at the time of landing, based on actual conditions, is at least in accordance with the criteria applicable at dispatch.

It is also clarified that when approved performance data contained in the aircraft flight manual (AFM) is insufficient for the purpose of assessing the LDTA, it may be supplemented with other data. Moreover, the operator has to specify in the operations manual (OM) the data and the assumptions made for the purpose of assessing the LDTA.

New CAT.OP.MPA.311 is proposed, in accordance with ICAO Annex 6, for the commander to report the braking action experienced during landing if it is not as expected from previous reports.

In CAT.POL.A.105 'General', paragraph (d) on damp runways is deleted for consistency with the changes introduced in the definitions, and the following paragraph (e) is renumbered to (d) accordingly.

In CAT.POL.A.215 'En-route — one-engine-inoperative (OEI)', further to taking into account proposal 6 of the JAA NPA-OPS 47, rule references are corrected and some text clarifications are introduced. Moreover, a new paragraph is added as the current rule assumes the availability of en route OEI net flight path data for performance class A aeroplanes. However, this is not always the case. Most notably, airworthiness standards applicable to commuter category aeroplanes (CS-23 or equivalent) do not require this information to be provided in the AFM. To address this disparity, it is necessary to specify the appropriate margin that should be applied to the OEI gross en route flight path data for performance class A aeroplanes. Accordingly, the OEI net flight path margins specified in CS-25 for two-, three- and four-engined aeroplanes are added.

In CAT.POL.A.220 'En-route — aeroplanes with three or more engines, two engines inoperative', further to the proposal of the JAA NPA-OPS 47, the following changes are introduced:

— the use of 'long range cruising speed' is replaced with 'cruising power', thus harmonising with the corresponding Federal Aviation Regulation (FAR) 121 requirement. This change will allow for more flexibility for operators who would be able to substantiate the use of a speed other than the long-range cruising speed to comply with the rule; and

— text clarifications are introduced and rule references are added; it should be noted that the reference to CAT.POL.A.235 is restricted to wet runways only (compared to the JAA proposal).

CAT.POL.A.230 'Landing — dry runways' is amended to:

— include the existence of reduced required landing distance operations as per proposed new CAT.POL.A.255;

— specify in paragraph (d)(2) that when corrections are provided in the AFM, they shall be taken into account in the computation of the landing distance;

— amend paragraph (f) on alternates because the original intent of this requirement was to cater for a rare and unique set of circumstances, which is better addressed by an exemption or a derogation than a general rule, and because this paragraph is partly superseded by the in-flight check part by the proposed new CAT.OP.MPA.303; however, EASA considers that an alleviation

for alternates is necessary for operations on contaminated runways and a proposal is made in this regard.

CAT.POL.A.235 'Landing — wet and contaminated runways' is amended to:

— take into account the conclusions on wet runways of the Flight Test Harmonization Working Group (FTHWG), a working group which reports to the FAA Aviation Rulemaking Advisory Committee. When specific performance data is provided in the AFM for wet runways, they shall be used in lieu of the application of the 15 % factor to the data for dry runways;

— clarify the requirement on performance credit for runways that have improving friction characteristics (such as grooved runways, PFC runways, or other existing or future technologies);

— include a specific requirement for 'specially prepared winter runways', which is consistent with the proposal made by RMT.0704 'Runway Surface Condition Assessment and Reporting' in the aerodromes domain (see NPA 2018-14 'Runway safety'[25]);

— include a reference to the appropriate paragraph of the new CAT.POL.A.255;

— clarify the requirements on alternate aerodromes in relation to the changes made in CAT.POL.A.230, and allow for some flexibility when dispatching on contaminated runways.

CAT.POL.A.250 'Approval of short landing operations' is amended to specify that, further to the new type of operations introduced into CAT.POL.A.255, short-landing operations cannot be conducted in combination with reduced required landing distance operations.

A new requirement 'CAT.POL.A.255 *Approval of reduced required landing distance operations*' is proposed for reduced required landing distance operations of performance class A aeroplanes. These operations are only allowed for non-scheduled on-demand CAT operations of aeroplanes that have an AFM eligibility statement and an MOPSC of 19, and require a prior approval by the CA. The rule allows the use of a landing factor of 80 % of the LDA, which in turn reduces the required landing distance.

The intent of this new requirement is to achieve proportionality of the rules for business aviation operations and harmonisation with the corresponding US requirement, under a set of conditions that, as explained in Chapter 4 (RIA) of NPA 2016-11, attain a level of safety that is equivalent to that intended by CAT.POL.A.230.

The proposed mitigating measures are developed in the following four main areas:

— operational conditions;

— flight crew;

— aerodrome conditions; and

— aeroplane characteristics and performance.

As regards aircraft eligibility, when the factors required by CAT.POL.A.230(a)(1) or (a)(2), as applicable, are the basis to demonstrate compliance with certification standards, the aeroplane should not be operated with reduced required landing distances, hence the need for AFM statement of eligibility.

[25] https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2018-14

As regards the assessment of aerodrome conditions, it should be noted that when the runway is forecast to be wet, a further check of the landing distance is required for the following reason: the landing distance calculated in accordance with CAT.POL.A.230 for dry runways at dispatch needs to be increased by 1.15 for the case of a wet runway. This distance is obtained as follows:

$$\text{Wet LD} = 1.15 \times 1.25 \times \text{ALD}$$

where:

— 'Wet LD' is the required landing distance for wet runways;

— '1.15' is the corrective factor for wet runways;

— '1.25' is the factor that results from the use of 80 % of the LDA; and

— 'ALD' is the actual landing distance for the aeroplane type that results from the AFM data for dry runways.

However, a comparison with the landing distance required by CAT.OP.MPA.303 was carried out for a number of performance class A aeroplane types, which showed that the landing distances based on CAT.OP.MPA.303 may be longer or shorter than the Wet LDs depending on the aeroplane type, number of operative reversers, and other assumptions made during the certification of the aeroplane.

These differences for certain performance class A aeroplane types may lead to the situation where the Wet LD for reduced required landing distance operations is systematically shorter than the one calculated in-flight due to the use of the 80 % landing factor.

To avoid this situation, a requirement is proposed to compare at the time of dispatch the Wet LD with the distance calculated in accordance with CAT.OP.MPA.303, and use the longer of the two.

Nevertheless, the requirement of CAT.OP.MPA.303 to check again the landing distance in- flight against the latest information available at the time of arrival remains valid.

CAT.POL.A.330 and CAT.POL.A.335 are amended consistently with CAT.POL.A.230 and CAT.POLA.235

A new requirement 'CAT.POL.A.355 *Approval of reduced required landing distance operations*' is proposed for reduced required landing distance operations of performance class B aeroplanes. These operations are allowed for specific runways at aerodromes where the public interest and operational necessity have been determined by the state of the aerodrome, and require a prior approval by the CA.

The rule allows the use of a landing factor of 80 % of the LDA, which in turn reduces the required landing distance.

The intent of the rule is to achieve proportionality of the rules for small CAT operators under a set of conditions that, as explained in Chapter 4 (RIA) of NPA 2016-11, are considered to attain a level of safety that is equivalent to that intended by CAT.POL.A.330.

The proposed mitigating measures are developed in the following four main areas:

— operational conditions;

— flight crew;

— aerodrome conditions; and

— aeroplane characteristics and performance.

Compared to the corresponding rule for performance class A aeroplanes, the requirements on training are simplified; however, further limitations are proposed on the control of the touchdown area, and operations are restricted to visual meteorological conditions (VMC) only.

The changes introduced into CAT.POL.A.215 and CAT.POL.A.220 in accordance with JAA NPA-OPS 47 are also introduced in CAT.POL.A.415 'En-route — OEI' for consistency, as applicable to performance class C aeroplanes.

The changes introduced in CAT.POL.A.215 and CAT.POL.A.220 in accordance with JAA NPA-OPS 47 are also introduced in CAT.POL.A.420 'En-route — aeroplanes with three or more engines, two engines inoperative' for consistency, as applicable to performance class C aeroplanes.

CAT.POL.A.430 and CAT.POL.A.435 are amended consistently with CAT.POL.A.230 and CAT.POLA.235

Annex VI (Part-NCC)

For clarity reasons, NCC.OP.225, previously applicable to both aeroplanes and helicopters, is split in two different requirements for each aircraft category. No content changes are introduced at rule level as the need to carry out a specific in-flight assessment of the LDTA on aeroplanes in accordance with ICAO Annex 6 will be developed at AMC level in a way that is proportionate to the intended operations.

Annex VII (Part-NCO)

For clarity reasons, NCO.OP.205, previously applicable to both aeroplanes and helicopters, is split in two different requirements for each aircraft category. No content changes are introduced at rule level as the need to carry out a specific in-flight assessment of the LDTA on aeroplanes in accordance with ICAO Annex 6 will be developed at AMC level in a way proportionate that is to the intended operations.

Annex VIII (Part-SPO)

For clarity reasons, SPO.OP.210, previously applicable to both aeroplanes and helicopters, is split in two different requirements for each aircraft category. No content changes are introduced at rule level as the need to carry out a specific in-flight assessment of the LDTA on aeroplanes in accordance with ICAO Annex 6 will be developed at AMC level in a way that is proportionate to the intended operations.

RMT.0695 'Non-ETOPS operations'

This Opinion proposes the amendment of Annex IV (Part-CAT) to Commission Regulation (EU) No 965/2012 to accommodate new business jet aeroplanes currently under development by several aeroplane manufacturers. Through this amendment, the current 45 360 kg MCTOM threshold is removed for non-ETOPS CAT operations of performance class A aeroplanes[26] with an MOPSC of 19 or less. As a result, all performance class A aeroplanes with an MOPSC of 19 or less will be allowed to operate with 120-minute diversion times without an ETOPS approval, or, subject to approval by the competent authority, up to 180-minute diversion times for turbojet aeroplanes. In addition, the amendment will clarify operational considerations and will remove the type design considerations

[26] In accordance with Annex I (Definitions) to Commission Regulation (EU) No 965/2012, '"performance class A aeroplanes" means multi-engined aeroplanes powered by turbo-propeller engines with an MOPSC of more than nine or a maximum take-off mass exceeding 5 700 kg, and all multi-engined turbo-jet powered aeroplanes;'.

related to 120–180-minute non-ETOPS operations with turbojet aeroplanes, therefore removing the need for aeroplane manufacturers to apply for this specific type design approval.

The following specific amendments are therefore proposed:

— to remove the mass threshold in CAT.OP.MPA.140(a); and

— to remove the type design requirement in CAT.OP.MPA.140(d) 'Maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval'.

This Opinion further proposes to amend point ORO.SEC.100 of Annex III (Part-ORO) to Commission Regulation (EU) No 965/2012 to allow CAT operations of aeroplanes that carry passengers without a reinforced secured cockpit door, whenever the aeroplane used for CAT operations has an MOPSC of 19 or less and an MCTOM above 45 500kg, but lower than 54 500 kg.

2.4. What are the stakeholders' views — outcome of the consultation

RMT.0249 (MDM.051) 'Alternate power supply for cockpit voice recorders (CVRs)'

The proposal to amend Annex IV (Part-CAT) to include requirements on alternate power supply was published in NPA 2018-03. The NPA received in total 61 comments, out of which only 5 where on the proposal to amend Annex IV (Part-CAT).

For instance, Airbus wished to ensure that EASA would also recognise the content of an FAA Issue Paper ELOS (Equivalent Level of Safety) on 'independent power source', as otherwise some of their designs could be impacted and therefore the economic impact mentioned in the NPA may not be negligible. EASA considers that the content of the proposed AMC 25.1457 (now also referred to in a new GM to Annex IV (Part-CAT), CAT.IDE.A.185(i) for better clarity) authorises design solutions like the ones accepted via the FAA ELOS.

Overall, the proposed rule and AMC/GM have been slightly changed to better align them with the FAA rules and CS-25 text, improve some wording, or remove unnecessary guidance.

CRD 2018-03, being largely unrelated to the said amendment of Annex IV (Part-CAT), will not be published as an appendix to this Opinion. It will be, however, published separately and shall be available on the EASA website.

RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)) 'In-flight recording for light aircraft'

108 comments were received to NPA 2017-03 from 20 commentators, of which 7 NAAs, 3 aircraft manufacturers, 1 equipment manufacturer, 1 pilot association, 2 operator associations, 1 balloon federation, and other categories of commentators. The main topics of these comments included mandating flight recorders for commercial SPO, mandating audio recording, protection of privacy of the flight crew, promoting voluntary installation of recording equipment on balloons, and minimum recording duration of lightweight flight recorders.

The comments led to minor changes to the text of the draft rules published with the NPA.

For a more detailed overview and for the responses to the comments, please consult CRD 2017-03, published as Appendix 2 to this Opinion.

RMT.0296 (OPS.008(a)) 'Review of the aeroplane performance requirements for air operations'

357 comments were received to NPA 2016-11 from 39 commentators, of which 8 NAAs (including EU MSs and the FAA), manufacturers, aircraft operators, organisations, and individuals.

Comments were submitted to all parts of the NPA and they were mixed in nature, ranging from support to the proposed amendments, to proposals for changes or improvements and, in some cases, expressing disagreement. The majority of the commentators focused on the following topics:

Comments on the proposal for a global reporting format of runway surface conditions and in-flight assessment of the landing distance at time of arrival (LDTA)

Overall, there were some general comments requesting consistency and synchronisation of the entry into force of the air operations and the aerodromes rules, better harmonisation with the ICAO definitions of the terms used, and extension of the proposal to non-commercial operations. Generally, EASA and the RMT.0296 RG agreed with those general comments.

On the definitions, it was decided to adopt the exact ICAO definitions for the purpose of global harmonisation. As regards consistency with the relevant aerodromes rules, which are an essential part of this global effort, the RMT.0296 RG worked in close coordination with the other EASA RMT.0704 RMG, by having cross-participation to both groups of certain members and constantly updating each other on the respective work done. The applicability dates of both sets of rules are intended to be in line with the ICAO target, which is November 2020.

The need to extend the proposal to non-commercial operations was acknowledged by EASA and agreed by the RMT.0296 RG. The necessary provisions will be added in a proportionate manner to the scope of those operations.

Several stakeholders highlighted the difficulty for certain categories of aircraft to comply with the new proposed standards for landing performance at the time of arrival. Particularly smaller aircraft or older aircraft designs may not have the required performance data and therefore the use of the generic corrective factors may not allow to continue their operation.

This was already envisaged at NPA level and alleviations were introduced for performance class B and class C aeroplanes, but further to the comments, even within performance class A aeroplanes some alleviations were introduced, along with the possibility to use other existing performance data. To this respect, also the RIA will be revised.

As regards the generic corrective factors, they were developed by the TALPA ARC and endorsed in the ICAO Doc 10064 'Aeroplane Performance Manual', therefore they will be kept as a baseline option.

Another issue that was raised by certain stakeholders, namely from those countries that are typically exposed to cold weather and heavy runway contamination, is the difficulty to comply with the proposal in challenging environments (short runways, heavy runway contamination, steep approaches, etc.) which may lead in some cases, with the use of the new runway condition codes (RCCs), to stop operations. These commentators proposed to introduce the possibility, for those aerodromes that have sufficient capabilities, to upgrade the RCCs under given conditions.

Such proposal is more suitable for inclusion in the aerodromes rules, where the concept of 'specially prepared winter runways' will be developed and then referenced in the air operations rules.

Comments on the proposal to use a reduced required landing distance (80 % landing factor)

This proposal, while supported by a considerable number of stakeholders, attracted the most controversial comments.

Particularly some stakeholders opposed the justification for the proposal and questioned the mass threshold that defines its applicability.

The reasons for the proposal on reduced required landing distances are clearly explained in the RIA of NPA 2016-11 with regard to business aviation operations and the need for harmonisation with the corresponding US rules. Such operations have been conducted in the US over the last 10 years with a satisfactory safety record. Considering that the conditions proposed by EASA to conduct the said operations are more restrictive than those in the US, the safety level is expected to remain at the same level or to even improve.

As regards aircraft eligibility for the said operations, the mass threshold will be changed to an AFM eligibility statement.

Other comments requested to make mandatory the use of flight data monitoring (FDM) in order to obtain the approval for such operations.

The aircraft categories for which FDM is mandatory are established in ORO.AOC.130 on the basis of general criteria which are not meant to be revised by this proposal. When FDM is available, it is recommended to be used also for the purposes of reduced required landing distance operations. Moreover, it is recommended to be used on a voluntary basis also when it is not required by ORO.AOC.130. However, when FDM is not available, alternative means for data collection will be considered.

RMT.0695 'Non-ETOPS operations'

23 comments were submitted by 10 commentators, including 6 EU NAAs and 2 aircraft manufacturers. All the comments supported the general approach. One of the most significant comments was questioning the use of a weight threshold as an adequate criterion for non-ETOPS operations.

A summary of the comments on the NPA, as well as the responses to individual comments, is included in CRD 2017-15. The revised draft AMC/GM are also included in the CRD. The outcome of the consultation of the proposed AMC/GM will be available in the explanatory note to the decision that will be issued following the adoption of the amending regulation, which will be based on the present Opinion.

With regard to the proposal on reinforced cockpit doors, MSs and the Commission were consulted during the drafting of the reply to the two relevant ICAO State Letters, and they widely supported the proposal.

2.5. What are the expected benefits and drawbacks of the proposals

RMT.0249 (MDM.051) 'Alternate power supply for cockpit voice recorders (CVRs)'

An alternate power source for the CVR and its dedicated sensor (the cockpit-mounted area microphone) can, in some cases, provide for a prolonged recording, and therefore help in better understanding the circumstances that led to an accident, or how the accident developed and how the

situation was managed by the flight crew. The proposal partially transposes into Regulation (EU) No 965/2012 the SARPs of ICAO Annex 6, Part I, and is harmonised with the FAA requirements.

The related economic impact is expected to be negligible. Indeed, current designs of newly manufactured aeroplanes would need to be modified. However, this is mitigated by the fact that aeroplane designers are already required to comply with the equivalent FAA air operation requirements to have an alternate power source. Therefore, redesign efforts have already been made by most of the manufacturers.

RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)) 'In-flight recording for light aircraft'

The full impact assessment that was developed in NPA 2017-03 included aeroplanes, helicopters and balloons used for commercial operations (CAT and SPO). Considering proportionality and cost, it was not found to be appropriate to develop options for sailplanes.

Four options were considered for aeroplanes and helicopters, among which Option A.4 was chosen for the development of the rules, because it had a significant positive safety impact while limiting the economic impact and the impact on general aviation.

Option A.4 is a combination of the following two other options:

— Option A.1: To promote the recording of flight parameters, audio and/or a view of the instrument panel for all models of light aeroplanes and light helicopters and for all types of operation, both commercial and non-commercial (no change to the rules); and

— Option A.3: To require carriage of a flight recorder for some categories of light aeroplanes and light helicopters, when they are used for commercial operations (refer to Section 2.3 of this Opinion).

Regarding balloons, a post-NPA assessment conducted by the EASA Balloon Collaborative Analysis Group (Balloon-CAG) of the benefit of Option B.1 (promote the fitment of balloons with means to record trajectory parameters and images from the basket interior) concluded that this is low priority for balloons. Therefore, EASA does not intend to implement Option B.1, unless new data or a need expressed by stakeholders require reconsideration. However, the impact assessment of the options regarding balloons in NPA 2017-03 is considered to be still valid.

For the detailed impact assessment, please consult Chapter 4 of NPA 2017-03.

RMT.0296 (OPS.008(a)) 'Review of the aeroplane performance requirements for air operations'

For two of the issues addressed by NPA 2016-11, namely:

— miscellaneous amendments to improve technical accuracy, clarity and consistency; and

— crosswind limitations,

a RIA was not considered to be necessary.

The other two issues, namely:

— implementation of ICAO amendments (which includes standards for runway surface condition assessment and reporting, airworthiness standards for landing performance computation at time of arrival, and in-flight assessment of landing performance at time of arrival); and

— reduced required landing distance for performance class A and class B aeroplane operations,

which have different starting points and drivers, have been considered under two separate RIAs.

Implementation of ICAO amendments

Along with the baseline option (Option 0 'No changes'), another option was considered:

— implement the ICAO amendments.

The impacts of the two options are analysed in detail in Chapter 4 of NPA 2016-11. Option 1 has been selected as the most appropriate one for the following reasons:

— it is expected to provide the highest safety benefit;

— it allows full alignment of the EU rules with the adopted ICAO SARPs; and

— it achieves a higher degree of harmonisation between EU and US rules.

However, further to the comments received on NPA 2016-11, it was acknowledged that certain categories of aeroplanes that fall within performance class A may have the same difficulties to obtain performance data for the assessment of the LDTA of performance class B and class C aeroplanes. Particularly smaller aeroplanes and older aircraft designs. For these cases, alleviations have been introduced either in terms of allowing at time of arrival the use of performance data for the time of dispatch or by allowing the AFM data to be supplemented by other data.

Furthermore, for aeroplanes that are certified in accordance with CS-23 or equivalent, the original requirement of CAT.OP.MPA.303 for the LDTA assessment has been restricted to a specific subset, namely to CS-23 certified aeroplanes at certification Level 4 and with performance level 'High speed'. These aeroplanes have similar performance characteristics to CS-25 certified aeroplanes, thus making possible the use of the guidance for CS-25 certified aeroplanes in order to develop the performance data for the assessment of the LDTA.

As regards the cost of developing the AFM data for the assessment of the LDTA for CS-23 certified aeroplanes, GAMA conducted a survey among OEMs which showed a significant increase in cost, ranging from 50 to 100 % depending on the aeroplane model, for those aeroplanes that have a traditional paper-based AFM. However, it should be noted that the majority of currently in-production aeroplanes have transitioned to digital AFM data. Said economic impact is further mitigated by the restricted subset of aeroplanes for which data for the assessment of the LDTA is required.

As regards the impact on non-commercial operations, it is considered to be minimal as no new implementing rules will be proposed.

Reduced required landing distance for performance class A and class B aeroplane operations

Along with the baseline option (Option 0 'No changes'), another option was considered:

— introduce the possibility to use a landing factor of 80 % of the landing distance available (LDA) for performance class A and class B aeroplanes under defined conditions and with the approval of the competent authority (CA).

The impacts of these two options are analysed in detail in Chapter 4 of NPA 2016-11. Option 1 has been selected as the most appropriate one because while it maintains the same level of safety as with the current rules, it is expected to achieve the following additional benefits:

— to have a medium positive social impact;

— to have a medium positive economic impact;

— to render EU rules more proportionate; and

— to achieve a higher degree of harmonisation between EU and US rules.

As regards the safety impact of the reduced landing distance proposal, further evidence was indicated by GAMA that resulted from an accident data review done in the US for eligible on-demand operations (EOD) conducted under FAA Part 135 and showed no runway excursions involving an EOD operation being cited in the probable cause or factors.

Data was obtained from the US National Transportation Safety Board (NTSB) and covered a time frame of 10 years, from the entry into force of the EOD rule in 2003 until 2013. A total of 337 runway excursions were recorded and none was associated by the safety investigation to the application of the EOD rule.

Considering that the conditions proposed by EASA to conduct the said operations are more restrictive than those in force in the US, the safety level is expected to remain the same or to even improve.

RMT.0695 'Non-ETOPS operations'

The comments received on NPA 2017-15 have been duly considered by EASA in the preparation of this Opinion. In this respect, EASA proposes with this Opinion clearer eligibility criteria for non-ETOPS operations, which are expected to ensure a level playing field in this area.

In addition, positive economic impacts and a higher regulatory harmonisation with other major regulatory authorities are expected with the removal of the type design requirements for 120–180-minute non-ETOPS operations.

2.6. How we monitor and evaluate the rules

Monitoring and evaluation is a continuous and systematic process of data collection and analysis about the implementation and effectiveness of a rule or activity. It generates factual information for future impact assessments and helps to identify implementation problems.

RMT.0249 (MDM.051) 'Alternate power supply for cockpit voice recorders (CVRs)'

With regard to this proposal, given the basic nature of the proposal itself and the general consensus on it, EASA does not envisage the need for monitoring and evaluation.

RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)) 'In-flight recording for light aircraft'

The options retained by the impact assessment of NPA 2017-03 are:

— safety promotion: promoting the voluntary installation of in-flight recording equipment (Option A.1); and

— equipment requirements: mandating the carriage of lightweight flight recorders (Option A.3).

Monitoring implementation

With regard to the first category of options (safety promotion), it is proposed to monitor their impact by means of a survey to be conducted 3 years after initiating safety promotion in order to check:

— how many stakeholders have been reached by the safety promotion activities;

— what are the most and the least convincing arguments of the safety promotion material; and

— how many stakeholders have decided to install in-flight recording equipment following safety promotion activities.

With regard to the second category of options (equipment requirements), monitoring is achieved through regular oversight activities performed by the NAAs and by EASA.

Evaluating the effectiveness of options (after implementation)

All retained options serve the common objective to increase the overall ratio of light aeroplanes and light helicopters which are fitted with in-flight recording equipment. The evaluation should consist in assessing whether the increase of the level of equipment has contributed to enhancing safety for light aircraft, either directly (by making the use of light aircraft safer and better monitored by operators, flight schools, aero clubs, etc.) or indirectly (by facilitating more in-depth investigations and the identification of more effective corrective actions).

Hence, it is proposed to check whether:

— the carriage of in-flight recording equipment makes the day-to-day use of light aeroplanes and light helicopters safer; and

— the investigations of accidents and serious incidents involving light aeroplanes and light helicopters can identify causes (otherwise unknown or not well understood) thanks to in-flight recording equipment, and determine corrective actions with more significant influence on the prevention of future accidents.

RMT.0296 (OPS.008(a)) 'Review of the aeroplane performance requirements for air operations' and RMT.0695 'Non-ETOPS operations'

With regard to these proposals, EASA suggests to monitor the following:

Indicator	When it will be monitored	How it will be monitored	Who will be in charge of the monitoring
Findings from standardisation inspection reports regarding non-compliance with the results	Annually	Via standardisation inspections	EASA Flight Standards Directorate
Authorities'/organisations' requests for, and EASA opinion on, flexibility provisions under Article 71 of the Basic Regulation	Annually	Via internal database	EASA Flight Standards Directorate
Number of AltMoCs issued with regard to: — non-ETOPS operations rules — runway global reporting format and related performance calculations — the use of reduced required landing distance	Annually	Via internal database	EASA Flight Standards Directorate

In addition, monitoring will be performed in terms of collecting and analysing data from different available sources through several tools (e.g. surveys). The responsible actors (e.g. MSs, NAAs, operators, etc.) for collecting and providing the data will be specified in the implementation phase.

In addition, the proposal might be subject to evaluation in order to judge how effective the adopted rules have been, or are, taking into account the predictions made in the impact assessment. The evaluation will provide an evidence-based judgement of the extent to which the proposal has been effective and efficient, consistent, and has achieved EU added value. The decision whether an evaluation will be necessary will be taken based also on the monitoring results.

Cologne, 21 February 2019

Patrick KY

Executive Director

3. References

3.1. Affected regulations

— Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1), as last amended

3.2. Related decisions

— Decision N° 2012/015/Directorate R of the Executive Director of the Agency of 24th October 2012 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council — 'Guidance Material to Annex I — Definitions'

— Decision 2014/017/R of the Executive Director of the Agency of 24 April 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-ORO of Regulation (EU) No 965/2012 and repealing Decision 2012/017/R of the Executive Director of the Agency of 24 October 2012 — 'AMC and GM to Part-ORO — Issue 2'

— Decision 2014/015/R of the Executive Director of the Agency of 24 April 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-CAT of Regulation (EU) No 965/2012 and repealing Decision 2012/018/R of the Executive Director of the Agency of 24 October 2012 — 'AMC and GM to Part-CAT — Issue 2'

— Decision N° 2013/021/Directorate R of the Executive Director of the Agency of 23 August 2013 on adopting Acceptable Means of Compliance and Guidance Material for Non-commercial operations with complex motor-powered aircraft — 'AMC and GM to Part-NCC'

— Decision 2014/016/R of the Executive Director of the Agency of 24 April 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-NCO of Regulation (EU) No 965/2012 and repealing Decision 2013/022/R of the Executive Director of the Agency of 23 August 2013 — 'AMC and GM to Part-NCO — Issue 2'

— Decision 2014/018/R of the Executive Director of the Agency of 24 April 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-SPO of Regulation (EU) No 965/2012 — 'AMC and GM to Part-SPO'

— Decision No. 2003/12/RM of the Executive Director of the Agency of 5 November 2003 on general acceptable means of compliance for airworthiness of products, parts and appliances (« AMC-20 ») — AMC 20-6 'Extended Range Operation with Two-Engine Aeroplanes ETOPS Certification and Operation', as last amended by Decision 2010/012/R of 16 December 2010

3.3. Other reference documents

— JAA NPA-OPS 47 — Aeroplane Performance

— SR UNKG-2008-076 — Aircraft Accident Report 1/2009, Air Accidents Investigation Branch (AAIB), UK Department for Transport, 9 January 2009

— SR NORW-2011-011 — Report SL 2011/10, Winter Operations, Friction Measurements and Conditions for Friction Predictions, Vol II — Main Report, Accident Investigation Board Norway (AIBN), May 2011

— European Action Plan for the Prevention of Runway Excursions (EAPPRE), Released Edition 1.0, January 2013

— IATA Safety Report 2014, 51st Edition, April 2015

— Research Project EASA.2011/08 NGW — Near-Ground Wind Gust Detection (Report no. NLR-CR-2012-143)

— Eurocontrol — 'Briefing: Business Aviation in Europe in 2012' — STATFOR Briefing 167

— Research Project EASA.2008/4 — Runway Friction Characteristics Measurement And Aircraft Braking (RuFAB), final report, March 2010

— EASA Safety Information Bulletin (SIB) No 2014-20 — Aeroplane Operations in Crosswind Conditions, 23 June 2014

— EASA Safety Information Bulletin (SIB) No 2018-0220 — Runway Surface Condition Reporting

— Federal Aviation Regulation (FAR) Part 121

— Federal Aviation Regulation (FAR) Part 135

— Federal Aviation Regulation (FAR) Part 91K

— FAA AC No. 25-32 — Landing Performance Data for Time of Arrival Landing Performance Assessments

— FAA AC No. 25-31— Takeoff Performance Data for Operations on Contaminated Runways

— ICAO Annex 6 to the Chicago Convention on International Civil Aviation, Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes, 10th Edition, July 2016

— ICAO Annex 6 to the Chicago Convention on International Civil Aviation, Operation of Aircraft, Part II — International General Aviation — Aeroplanes, 9th Edition, July 2016

— ICAO Annex 8 to the Chicago Convention on International Civil Aviation, Airworthiness of Aircraft, 11th Edition, July 2010.

— ICAO Annex 14 to the Chicago Convention on International Civil Aviation, Aerodromes, Volume I — Aerodrome Design and Operations, 7th Edition, July 2016

— ICAO State Letter AN 4/1.1.55-15/30 of 29 May 2015

— ICAO State Letter AN 3/5.10-16/29 of 6 April 2015

— ICAO State Letter AN 11/1.3.29-16/12 of 8 April 2016

— ICAO State Letter AN 4/1.2.26-16/19 of 5 April 2016

— ICAO Doc 9981 — PROCEDURES FOR AIR NAVIGATION SERVICES (PANS) — Aerodromes

— ICAO Doc 4444 — PROCEDURES FOR AIR NAVIGATION SERVICES (PANS) — Air Traffic Management (ATM)

— ICAO Circular 329 'Runway Surface Condition Assessment, Measurement and Reporting'

— Australian Government, Civil Aviation Authority, Civil Aviation Order (CAO) 82.0, Air Operators' Certificates – applications for certificates and general requirements, dated 21 November 2012 taking into account amendments up to Civil Aviation Order 82.0 Amendment Instrument 2012 (No. 2)

— Canadian Aviation Regulations, Part VII — Commercial Air Services, current to July 22, 2014

- Subpart 3 — Air Taxi Operations
- Subpart 4 — Commuter Operations
- Subpart 5 — Airline Operations

— Civil Aviation Authority of New Zealand, Civil Aviation Rules

- Part 121, Air Operations – Large Aeroplanes, CAA consolidation current as of 1 April 2014
- Part 125, Air Operations – Medium Aeroplanes, CAA consolidation current as of 1 April 2014

— Robert E. Breiling Associates Inc., Business Turbine Aircraft Accidents Involving Extended Range Operations 1964 – 6 Mos. 1996 for National Business Aircraft Association Inc., July 1996

— Robert E. Breiling Associates Inc., Business Turbine Aircraft Accidents Involving Extended Range Operations 1996 through 2013 for Bombardier Aerospace, September, 2014

4. Appendices

— **Appendix 1** to Opinion No 02/2019: **Draft AMC & GM to Commission Regulation (EU) No 965/2012** related to RMT.0249 (MDM.051) [separate document]

— **Appendix 2** to Opinion No 02/2019: **CRD 2017-03** (RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)) [separate document]

— **Appendix 3** to Opinion No 02/2019: **Draft AMC & GM to Commission Regulation (EU) No 965/2012** related to RMT.0271 (MDM.073(a)) & RMT.0272 (MDM.073(b)) [separate document]

— **Appendix 4** to Opinion No 02/2019: **CRD 2016-11** (RMT.0296 (OPS.008(a)) [separate document]

— **Appendix 5** to Opinion No 02/2019: **Draft AMC & GM to Commission Regulation (EU) No 965/2012** related to RMT.0296 (OPS.008(a)) [separate document]

— **Appendix 6** to Opinion No 02/2019: **CRD 2017-15** (RMT.0695) [separate document]

— **Appendix 7** to Opinion No 02/2019: **Draft AMC & GM to Commission Regulation (EU) No 965/2012** related to RMT.0695 [separate document]