



Notice of Proposed Amendment 2017-15

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

RMT.0695

EXECUTIVE SUMMARY

This Notice of Proposed Amendment (NPA) addresses harmonisation and level playing field issues related to the commercial operation of performance class A aeroplanes with a maximum operational passenger seating configuration (MOPSC) of 19 or less without an ETOPS approval over routes that contain a point further from an adequate aerodrome than the distance flown in 60 minutes at the one-engine-inoperative cruising speed. These operations are referred to as ‘non-ETOPS operations’.

The objective of this NPA is to harmonise the applicability of non-ETOPS operation requirements for the affected aeroplanes operated by European-based commercial air transport (CAT) operators with similar CAT operators in other parts of the world, including the United States, Canada, Australia and New Zealand.

This NPA proposes to increase the current non-ETOPS operation mass threshold from 45 360 to 60 000 kg in order to accommodate growth of this market segment and to remove the specific type design approval for non-ETOPS operations between 120 and 180 minutes. This NPA specifically proposes an amendment to Annex IV (Part-CAT) to Regulation (EU) No 965/2012, and in particular to the applicability requirements of point CAT.OP.MPA.140. It also proposes amendments to AMC 20-6, and to the AMCs to CAT.OP.MPA.140.

The proposed amendments will maintain the current level of safety for the affected aeroplanes, while allowing for increased European harmonisation with other regulatory jurisdictions and avoiding undue costs for aeroplane manufacturers and operators.

Action area:	Manufacturers	Rulemaking group:	No (stakeholder-led rulemaking task (SLRT) group instead)
Affected rules:	Commission Regulation (EU) No 965/2012	Rulemaking Procedure:	Standard
Affected stakeholders:	Operators		
Driver:	Level playing field		
Impact assessment:	Light		

• EASA rulemaking process milestones

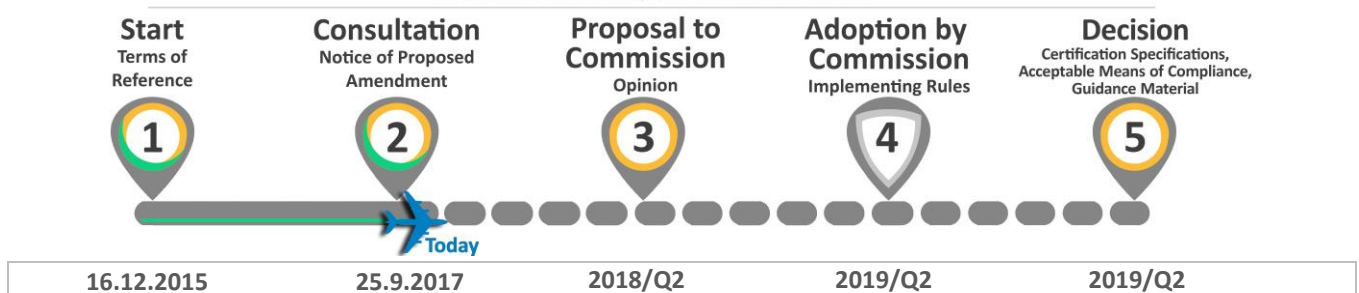


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1. About this NPA

1.1. How this NPA was developed

The European Aviation Safety Agency (EASA) developed this NPA in line with Regulation (EC) No 216/2008¹ (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure². This rulemaking activity is included in the EASA 5-year Rulemaking Programme³ under rulemaking task RMT.0695.

This rulemaking task 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. Instead, the SLRT leveraged industry technical expertise to develop an NPA that was presented to EASA.

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

This SLRT option was presented to and reviewed by the Safety Standards Consultative Committee (SSCC) at its December 2014 and June 2015 meetings. A white paper about non-ETOPS operations with business jet aeroplanes was also provided to the EASA FCL & OPS Thematic Advisory Group (TAG) for its March 2015 meeting. The SSCC and the FCL & OPS TAG were in favour of the rulemaking task moving forward and no objections were raised.

An SLRT group has, therefore, been established; it included members from the main stakeholders that manufacture aeroplanes and engines affected by the ETOPS mass threshold as well as additional members from the operator community and EASA.

The resulting NPA is hereby submitted to all interested parties⁴ for consultation.

1.2. How to comment on this NPA

Please submit your comments using the automated **Comment-Response Tool (CRT)** available at <http://hub.easa.europa.eu/crt/>⁵.

The deadline for submission of comments is **3 January 2018**.

1.3. The next steps

Following the closing of the public commenting period, EASA — in coordination with the SLRT group — will review all comments.

¹ Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1) (<http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1467719701894&uri=CELEX:32008R0216>).

² EASA is bound to follow a structured rulemaking process as required by Article 52(1) of Regulation (EC) No 216/2008. 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 <http://easa.europa.eu/rulemaking/annual-programme-and-planning.php>

⁴ In accordance with Article 52 of Regulation (EC) No 216/2008 and Articles 6(3) and 7 of the Rulemaking Procedure.

⁵ In case of technical problems, please contact the CRT webmaster (crt@easa.europa.eu).



Based on the comments received, EASA will develop an opinion containing the proposed amendments to Regulation EU) No 965/2012. The opinion will be submitted to the European Commission, which will use it as a technical basis in order to prepare an EU regulation.

Following the adoption of the regulation, EASA will issue a decision containing the acceptable means of compliance (AMC)/guidance material (GM).

The comments received and the EASA responses will be reflected in a comment-response document (CRD). The CRD will be annexed to the opinion.



2. In summary — why and what

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

The requirements for performance class A aeroplanes with a maximum operational passenger seating configuration (MOPSC) of 19 or less to conduct ETOPS 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 maximum certified take-off mass (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 are developing 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 at or below the current MCTOM threshold, the additional mass would require these operators to obtain an ETOPS approval for the same routes, when operating in CAT.

- This threshold of 45 360 kg, 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, relative 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 — while CAT.OP.MPA does require a specific type design approval for 120–180-minute non-ETOPS operations using performance class A aeroplanes with an MOPSC of 19 or less and an MCTOM less than 45 360 kg.

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

Neither is such a mass threshold defined in Amendment 38 to ICAO Annex 6 Part I, which renamed ETOPS as 'extended diversion time operations' (EDTO) and introduced significant technical changes to the concept. The ICAO provisions only require States contracting 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.



For a more detailed analysis of the issues addressed by this proposal, please refer to the impact assessment Section 4.1. 'What is the issue'.

2.2. What we want to achieve — objectives

The general objectives of the EU in the field of civil aviation are defined in Article 2 of the Basic Regulation. This proposal will contribute to achieving these objectives by addressing the issues outlined in Chapter 1.

The specific objective of this proposal is to analyse whether the European regulatory framework needs to be updated in order to accommodate new business jet aeroplanes operated by European CAT operators in the 180-minute non-ETOPS operation category, in order to:

- increase harmonisation with the regulatory material 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 therefore avoid an undue burden on European CAT operators of business jet aeroplanes.

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

This NPA proposes an amendment to Annex IV (Part-CAT) to Regulation (EU) No 965/2012 to account for new business jet aeroplanes currently under development by several aeroplane manufacturers. This amendment will raise the MCTOM threshold for non-ETOPS CAT operation of performance class A aeroplanes⁶ with an MOPSC of 19 or less from 45 360 kg (as currently laid down in CAT.OP.MPA.140) to a new MCTOM threshold of 60 000 kg. As a result, such aeroplanes with an MCTOM below the new higher mass threshold value will be able to operate with 120- to 180-minute diversion times without an ETOPS approval. In addition, the amendment will clarify operational considerations and remove the type design considerations related to 120–180-minute non-ETOPS operations, therefore removing the need for aeroplane manufacturers to apply for this specific type design approval.

This NPA does not propose a change to the existing threshold time for business aeroplanes, but instead proposes a change to the size of business aeroplanes that can be subject to the threshold time established by EASA for CAT operators on behalf of the EU Member States.

For consistency, this NPA also proposes amendments to sections of AMC 20-6, entitled 'Extended Range Operation with Two-Engine Aeroplanes ETOPS Certification and Operation', to reflect the proposed MCTOM threshold.

The proposed revision to the MCTOM threshold and to the type design requirement for 120–180-minute non-ETOPS operations affects existing IRs and AMCs. The paragraphs affected by these changes are:

- CAT.OP.MPA.140(a) and (d) 'Maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval';

⁶ In accordance with Annex I 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;.

- AMC1 CAT.OP.MPA.140(d) 'Maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval';
- AMC 20-6: Acceptable Means of Compliance and Guidance Material for 'Extended Range Operations with Two-Engined Aeroplanes ETOPS Certification and Operation'.

It should be noted that the text used as a starting point for the proposed amendments of this NPA is the one stemming from NPA 2015-18(A) and (B)⁷, published on 27 November 2015.

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

The expected benefits and drawbacks of the proposal are summarised below. For the full impact assessment of alternative options, please refer to Chapter 7.

Considering the issues and objectives defined in Section 2.1 and 2.2 above, the following two options have been identified and compared within the impact assessment:

- Option 0 'No policy change' does not address the issues identified; and
- Option 1 'Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations'.

The SLRT group also reviewed the work of RMT.0264 (MDM.066) 'Executive Interiors Accommodation' and RMT.0429/RMT.0493 (OPS.071(b)) 'Updating and harmonising of FTL for commercial air transport (CAT) by aeroplane for air taxi operations and single-pilot operations taking into account operational experience and recent scientific evidence', which addressed these aeroplanes through a different regulatory structure, but this was not considered as a formal option in the analysis since the outcome would be the same as for Option 1.

The primary reason for not using the terms used for RMT.0264 ('low occupancy') or RMT.0429/RMT.0493 ('air taxi') was that both terms are tied to how a specific aeroplane is operated as opposed to how an aeroplane model is certified. As a result, an original equipment manufacturer (OEM) would be put in a position of having to obtain ETOPS type certification for its aeroplane because its future use might not fit within the 'low occupancy' or 'air taxi' categories. The mass-based threshold provides the clear definition needed for type design.

Option 1 has been considered to be the most appropriate because it meets the objectives of Section 2.2 while maintaining an adequate level of safety for business aeroplane operations with aeroplanes having an MCTOM above the current 45 360 kg threshold.

⁷ <https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2015-18>



3. Proposed amendments and rationale in detail

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

- deleted text is ~~struck through~~;
- new or amended text is highlighted in grey;
- an ellipsis '(...)' indicates that the rest of the text is unchanged.

3.1. Draft regulation (Draft EASA opinion)

ANNEX IV

COMMERCIAL AIR TRANSPORT OPERATIONS

[PART-CAT]

SUBPART B

OPERATING PROCEDURES

SECTION 1

Motor-powered aircraft

(...)

CAT.OP.MPA.140 Maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval

- (a) Unless approved by the competent authority in accordance with Annex V (Part-SPA), Subpart F, the operator shall not operate a two-engined aeroplane over a route that contains a point further from an adequate aerodrome, under standard conditions in still air, than the distance defined in the appropriate subparagraph below for that type of aeroplane:
- (1) for performance class A aeroplanes with either:
 - (i) a maximum operational passenger seating configuration (MOPSC) of 20 or more; or
 - (ii) a maximum certified take-off mass of ~~45 360~~ 60 000 kg or more,

the distance flown in 60 minutes at the one-engine-inoperative (OEI) cruising speed determined in accordance with (b);
 - (2) for performance class A aeroplanes with:
 - (i) an MOPSC of 19 or less; and
 - (ii) a maximum certified take-off mass less than ~~45 360~~ 60 000 kg,

the distance flown in 120 minutes or, subject to approval by the competent authority, up to 180 minutes for turbojet aeroplanes, at the OEI cruise speed determined in accordance with (b);
 - (3) for performance class B or C aeroplanes:
 - (i) the distance flown in 120 minutes at the OEI cruise speed determined in accordance with (b); or



- (ii) 300 NM, whichever is less.
- (b) The operator shall determine a speed for the calculation of the maximum distance to an adequate aerodrome for each two-engined aeroplane type or variant operated, not exceeding VMO (maximum operating speed), based upon the true airspeed that the aeroplane can maintain with one engine inoperative.
- (c) The operator shall include the following data, specific to each type or variant, in the operations manual:
 - (1) the determined OEI cruising speed; and
 - (2) the determined maximum distance from an adequate aerodrome.
- (d) To obtain the approval referred to in (a)(2), the operator shall provide evidence that:
 - (1) ~~the aeroplane/engine combination holds an extended range operations with two-engined aeroplanes (ETOPS) type design and reliability approval for the intended operation~~ procedures have been established for flight planning and dispatch;-
 - (2) ~~a set of conditions has been implemented to ensure that the aeroplane and its engines are maintained to meet the necessary reliability criteria~~ specific maintenance instructions and procedures to ensure the intended levels of continued airworthiness and reliability of the aeroplane and its engines have been established and included in the operator's aircraft maintenance programme in accordance with Annex I (Part-M) to Commission Regulation (EU) No 1321/2014, including:
 - (i) an engine oil consumption programme; and
 - (ii) an engine condition monitoring programme;-and
 - (3) the flight crew and all other operations personnel involved are trained and suitably qualified to conduct the intended operation.

3.2. Draft acceptable means of compliance and guidance material (Draft EASA decision)

3.2.1. AMC/GM to Annex IV (Part-CAT)

AMC1 CAT.OP.MPA.140(d) Maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval

OPERATION OF NON-ETOPS-COMPLIANT TWIN TURBO-JET AEROPLANES WITH MOPSC OF 19 OR LESS AND MCTOM LESS THAN 45 360 60 000 KG BETWEEN 120 AND 180 MINUTES FROM AN ADEQUATE AERODROME

(a) ~~For operations between 120 and 180 minutes, due account should be taken of the aeroplane's design and capabilities as outlined below and the operator's experience related to such operations. the operator should include the relevant~~ Relevant information should be included in the its operations manual and the operator's its maintenance procedures. The term 'the aeroplane's design' in this AMC does not imply any additional type design approval specifications beyond the applicable original type certificate (TC) specifications.

~~(b) Systems capability~~

~~Aeroplanes should be certified to CS-25 as appropriate or equivalent (e.g. FAR-25). With respect to the capability of the aeroplane systems, the objective is that the aeroplane is capable of a safe diversion~~



from the maximum diversion distance with particular emphasis on operations with OEI or with degraded system capability. To this end, the operator should give consideration to the capability of the following systems to support such a diversion:

1. ~~Propulsion systems: the aeroplane engine should meet the applicable specifications prescribed in CS-25 and CS-E or equivalent (e.g. FAR-25, FAR-E), concerning engine TC, installation and system operation. In addition to the performance standards established by the Agency or competent authority at the time of engine certification, the engines should comply with all subsequent mandatory safety standards specified by the Agency or competent authority, including those necessary to maintain an acceptable level of reliability. In addition, consideration should be given to the effects of extended duration single engine operation (e.g. the effects of higher power demands such as bleed and electrical).~~
 2. ~~Airframe systems: with respect to electrical power, three or more reliable as defined by CS-25 or equivalent (e.g. FAR-25) and independent electrical power sources should be available, each of which should be capable of providing power for all essential services which should at least include the following:~~
 - ~~(i) sufficient instruments for the flight crew providing, as a minimum, attitude, heading, airspeed and altitude information;~~
 - ~~(ii) appropriate pitot heating;~~
 - ~~(iii) adequate navigation capability;~~
 - ~~(iv) adequate radio communication and intercommunication capability;~~
 - ~~(v) adequate flight deck and instrument lighting and emergency lighting;~~
 - ~~(vi) adequate flight controls;~~
 - ~~(vii) adequate engine controls and restart capability with critical type fuel (from the stand point of flame out and restart capability) and with the aeroplane initially at the maximum reflight altitude;~~
 - ~~(viii) adequate engine instrumentation;~~
 - ~~(ix) adequate fuel supply system capability including such fuel boost and fuel transfer functions that may be necessary for extended duration single or dual engine operation;~~
 - ~~(x) such warnings, cautions and indications as are required for continued safe flight and landing;~~
 - ~~(xi) fire protection (engines and auxiliary power unit (APU));~~
 - ~~(xii) adequate ice protection including windshield de-icing; and~~
 - ~~(xiii) adequate control of the flight crew compartment and cabin environment including heating and pressurisation.~~
- ~~The equipment including avionics necessary for extended diversion times should have the ability to operate acceptably following failures in the cooling system or electrical power systems.~~
- ~~For single engine operations, the remaining power electrical, hydraulic, and pneumatic should continue to be available at levels necessary to permit continued safe flight and landing, and to~~



provide those services necessary for the overall safety of the passengers and crew. As a minimum, following the failure of any two of the three electrical power sources, the remaining source should be capable of providing power for all of the items necessary for the duration of any diversion. If one or more of the required electrical power sources are provided by an APU, hydraulic system or air driven generator/ram air turbine (ADG/RAT), the following criteria should apply as appropriate:

- (i) to ensure hydraulic power (hydraulic motor generator) reliability, it may be necessary to provide two or more independent energy sources;
- (ii) the ADG/RAT, if fitted, should not require engine dependent power for deployment; and
- (iii) the APU should meet the criteria in (b)(3).

- (3) APU: the APU, if required for extended range operations, should be certified as an essential APU and should meet the applicable CS-25 and CS-APU provisions or equivalent (e.g. FAR-25).
- (4) Fuel supply system: consideration should include the capability of the fuel supply system to provide sufficient fuel for the entire diversion taking account of aspects such as fuel boost and fuel transfer.

(be) Engine events and corrective action

- (1) All engine events and operating hours should be reported by the operator to the airframe and engine supplemental type certificate (STC) holders, as well as to the competent authority.
- (2) These events should be evaluated by the operator in consultation with the competent authority and with the engine and airframe (S)TC holders. The competent authority may consult the Agency to ensure that worldwide data are evaluated.
- (3) Where statistical assessment alone is not applicable, e.g. where the fleet size or accumulated flight hours are small, individual engine events should be reviewed on a case-by-case basis.
- (4) The evaluation or statistical assessment, when available, may result in corrective action or the application of operational restrictions.
- (5) Engine events could include engine shutdowns, both on-ground and in-flight, excluding normal training events, including flameout, occurrences where the intended thrust level was not achieved or where crew action was taken to reduce thrust below the normal level for whatever reason, and unscheduled removals.
- (6) The operator should Arrangements to ensure that all corrective actions required by the Agency competent authority are implemented.

(cd) Maintenance

The maintenance programme in accordance with Annex I (Part-M) to Commission Regulation (EU) No 1321/2014⁸ (Part-M) should be based upon reliability programmes including, but not limited to, the following elements:

- (1) engine oil consumption programmes: such programmes are intended to support engine condition trend monitoring; and

⁸ Commission Regulation (EU) No 1321/2014 of 26 November 2014 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks (OJ L 362, 17.12.2014, p. 1).

- (2) engine condition monitoring programmes: a programme for each engine that monitors engine performance parameters and trends of degradation ~~that~~ and provides for maintenance actions to be undertaken prior to significant performance loss or mechanical failure.

(de) Flight crew training

The operator should establish a flight crew training programme for this type of operation ~~that should~~ include, in addition to the requirements of Subpart FC (Flight Crew) of Annex III (Part-ORO) (ORO-FC), particular emphasis on the following:

- (1) Fuel management: verifying required fuel on board prior to departure and monitoring fuel on board en-route, including calculation of fuel remaining. Procedures should provide for an independent cross-check of fuel quantity indicators, e.g. fuel flow may be used to calculate the fuel burned, which may be compared with the indicated fuel remaining. It should be confirmed that the fuel remaining is sufficient to satisfy the critical fuel reserves.
- (2) Procedures for single and multiple failures in flight that may give rise to go/no-go and diversion decisions — policy and guidelines to aid the flight crew in the diversion decision-making process and emphasising the need for constant awareness of the closest weather-permissible alternate aerodrome in terms of time.
- (3) OEI performance data: drift-down procedures and OEI service ceiling data.
- (4) ~~Weather~~ Meteorological reports and flight requirements: meteorological aerodrome reports (METARs) and terminal aerodrome forecast (TAF) reports and obtaining in-flight weather updates on the en-route alternate (ERA), destination and destination alternate aerodromes. Consideration should also be given to forecast winds, including the accuracy of the forecast compared to actual wind experienced during flight and meteorological conditions along the expected flight path at the OEI cruising altitude and throughout the approach and landing.

(ef) Pre-departure check

A pre-departure check, additional to the pre-flight inspection required by Part-M and designed to verify the status of the aeroplane's significant systems, should be ~~reflected~~ conducted. Its content should be ~~and~~ described in the operations manual. The operator should ensure that flight crew members ~~who are responsible for the pre-departure check of an aeroplane should~~ ~~are~~ be fully trained and competent to conduct a pre-departure check of the aeroplane ~~do it~~. The operator's required training programme ~~required~~ should cover all relevant tasks, with particular emphasis on checking required fluid levels.

(fg) MEL

The operator should establish in its MEL the minimum equipment that has to be serviceable for non-ETOPS operations between 120 and 180 minutes. The operator should ensure that the MEL ~~should~~ takes into account all items specified by the manufacturer relevant to this type of operations ~~in accordance with this AMC~~.

(gh) Dispatch/flight planning rules

The operator's ~~should~~ establish dispatch procedures ~~rules should~~ that addressing the following:



- (1) Fuel and oil supply: an aeroplane should not be dispatched on an extended range flight unless it carries sufficient fuel and oil to comply with the applicable operational requirements and any additional reserves determined in accordance with the following:
 - (i) Critical fuel scenario: —the critical point is the furthest point from an alternate aerodrome assuming a simultaneous failure of an engine and the cabin air pressurisation system. For those aeroplanes that are type-certificated to operate above flight level 450, the critical point is the furthest point from an alternate aerodrome, assuming an engine failure. The operator should carry additional fuel for the worst-case fuel burn condition (one engine vs two engines operating) if this is greater than the additional fuel calculated in accordance with the fuel requirements in CAT.OP.MPA, as follows, in order to:
 - (A) fly from the critical point to an alternate aerodrome:
 - (a) at 10 000 ft;
 - (b) at 25 000 ft or the single-engine ceiling, whichever is lower, provided that all occupants can be supplied with and use oxygen for the time required to fly from the critical point to an alternate aerodrome; or
 - (c) at the single-engine ceiling, provided that the aeroplane is type-certificated to operate above flight level 450;
 - (B) descend and hold at 1 500 ft for 15 minutes in International Standard Atmosphere (ISA) conditions;
 - (C) descend to the applicable MDA/DH followed by a missed approach (taking into account the complete missed approach procedure); followed by
 - (D) a normal approach and landing.
 - (ii) Ice protection: additional fuel used when operating in icing conditions (e.g. operation of ice protection systems (engine/airframe as applicable)) and, when manufacturer's data is available, take account of ice accumulation on unprotected surfaces if icing conditions are likely to be encountered during a diversion.
 - (iii) APU operation: if an APU has to be used to provide additional electrical power, consideration should be given to the additional fuel required.
- (2) Communication facilities: the operator should ensure the availability of communications facilities in order to allow reliable two-way voice communications between the aeroplane and the appropriate ATC unit at OEI cruise altitudes.
- (3) Aircraft Technical log review to ensure that proper MEL procedures, deferred items, and required maintenance checks have been completed.
- (4) ERA aerodrome(s): the operator should ensure ensuring that ERA aerodromes are available for the intended route, within the distance flown in 180 minutes based upon the OEI cruising speed, which is a speed within the certificated limits of the aeroplane, selected by the operator and approved by the competent authority, confirming that, based on the available meteorological information, the weather conditions at ERA aerodromes are at or above the applicable minima for the period of time during which the aerodrome(s) may be used.

Table 1:

Planning minima

Approach facility	Alternate aerodrome ceiling	Weather minima RVR/VIS
PA	DA/H + 200 ft	RVR/VIS + 800 m
NPA Circling approach	MDA/H + 400 ft	RVR/VIS + 1 500 m

3.2.2. AMC 20-6 on Acceptable Means of Compliance and Guidance Material for Extended Range Operations with Two-Engined Aeroplanes ETOPS Certification and Operation

Chapter I GENERAL CONSIDERATIONS

SECTION 4: Terminology

e. Extended Range Entry Point

The extended range entry point is the first point on the aeroplane's route which is:

- For two-engined aeroplanes with a maximum approved passenger seating configuration of 20 or more, or with a maximum certified take-off mass of 45 360 60 000 kg or more, at 60 minutes flying time at the approved one-engine-inoperative cruise speed (under standard conditions in still air) from an adequate aerodrome.
- For two-engined aeroplanes with a maximum approved passenger seating configuration of 19 or less and a maximum certified take-off mass of less than 45 360 60 000 kg, at 180 minutes flying time at the approved one-engine-inoperative speed (in still air) from an adequate aerodrome.

(...)

Chapter III OPERATIONAL APPROVAL CONSIDERATIONS

Section 1: APPLICABILITY

This acceptable means of compliance is for operators seeking an ETOPS operational approval to operate either:

- (1) Two-engined aeroplanes with a maximum passenger seating configuration of 20 or more, or with a maximum certified take-off mass of 45 360 60 000 kg or more, in excess of 60 minutes at the approved one-engine-inoperative speed (under standard conditions in still air) from an adequate aerodrome;
- (2) or Two-engined aeroplanes with a maximum passenger seating configuration of 19 or less and a maximum certified take-off mass of less than 45 360 60 000 kg, in excess of 180 minutes at the approved one-engine-inoperative speed (in still air) from an adequate aerodrome.

(...)



SECTION 7: ETOPS APPROVAL CATEGORIES

There are 4 approval categories:

- Approval for diversion times up to 90 minutes or less ~~diversion time~~;
- Approval for diversion times above 90 minutes and up to 180 minutes;
- Approval for diversion times above 180 minutes;
- Approval for diversion times above 180 minutes for operators of two-engined aeroplanes with a maximum passenger seating configuration of 19 or less and a maximum certified take-off mass less than ~~45 360~~ 60 000 kg.

An operator seeking ETOPS approval in one of the above categories should comply with the requirements that are common to all categories and the specific requirements of the particular category for which approval is sought.

(...)

7.2.4 APPROVAL FOR DIVERSION TIMES ABOVE 180 MINUTES FOR OPERATORS OF TWO-ENGINED AEROPLANES WITH A MAXIMUM PASSENGER SEATING CONFIGURATION OF 19 OR LESS AND A MAXIMUM CERTIFIED TAKE-OFF MASS LESS THAN ~~45 360~~ 60 000 KG

(...)



4. Impact assessment (IA)

4.1. What is the issue

4.1.1. History of ETOPS in business aviation

The European Air OPS requirements establishing a maximum allowable distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval were introduced via JAR OPS 1.245 at Change 1, in 1998 (see also JAA NPA-OPS-7). At the time of introducing these requirements, it was acknowledged that business aviation (i.e. operation of aeroplanes having an MOPSC of 19 or less and an MCTOM less than 45 360 kg) warranted that special consideration would be given to the subject requirement for business jet aeroplane operations.

Subsequently in 2001, the provisions of subparagraph (a)(2) were adopted into JAR OPS 1 at Amendment 3, arising from JAA NPA-OPS-14. The provisions of JAR OPS 1.245(a)(2) allowed two-engined performance class A aeroplanes having an MOPSC of 19 or less and an MCTOM less than 45 360 kg to operate over routes with diversion times of 120 minutes, and up to 180 minutes under certain conditions, without an ETOPS approval.

Key to the JAA debate was to establish an appropriate mass threshold for business jets being subject to ETOPS requirements while at the same time providing a buffer between business jets and aeroplanes used by scheduled airlines conducting CAT operations.

Currently, CAT.OP.MPA.140 of Annex IV (Part-CAT) to Regulation (EU) No 965/2012 provides for non-ETOPS operations of business jets through an accommodation of aeroplanes based on their MOPSC and an MCTOM of 45 360 kg (transposed from the JAA regulatory framework). In addition, for 120–180-minute non-ETOPS operations, Regulation (EU) No 965/2012 requires aeroplanes to be granted a specific type design approval based on the considerations contained in AMC1 to CAT.OP.MPA.140(d).

The accommodation established in Regulation (EU) No 965/2012 using maximum certified take-off mass was made in an attempt to harmonise European regulations with other regulatory frameworks for ETOPS using business jets. As an example, the US FAA accommodates non-ETOPS operations below 180 minutes without type design requirements within the equivalent regulations for on-demand CAT operators under 14 CFR Part 135, which is differentiated from 14 CFR Part 121 for scheduled CAT operations. A key discussion within the JAA OST was about how to accommodate business jets within a single CAT regulatory part of JAR OPS 1 without the differentiator of Part 135 versus Part 121.

Today, both Gulfstream Aerospace Corporation and Bombardier Inc. are manufacturing or are designing business jets that have an MCTOM of more than 45 360 kg (100 000 lb).



4.1.2. Using mass as a regulatory discriminator

Several manufacturers have already developed or are currently developing business jets that have an MCTOM slightly above 45 360 kg. Currently, three models have been announced, including the Bombardier Global 7000 (at 49 409 kg), the Bombardier Global 8000 (at 49 227 kg), and the Gulfstream G650ER (at 46 992 kg), which have already been certified and entered into service in 2014. These aeroplanes are primarily differentiated from other already certified aeroplanes made by the same manufacturers by having larger fuel capacities to achieve longer ranges. In addition to these three aeroplane models, it is understood that other aeroplane models that will have an MCTOM above 45 360 kg are also planned to enter into service during the next 10–20 years.

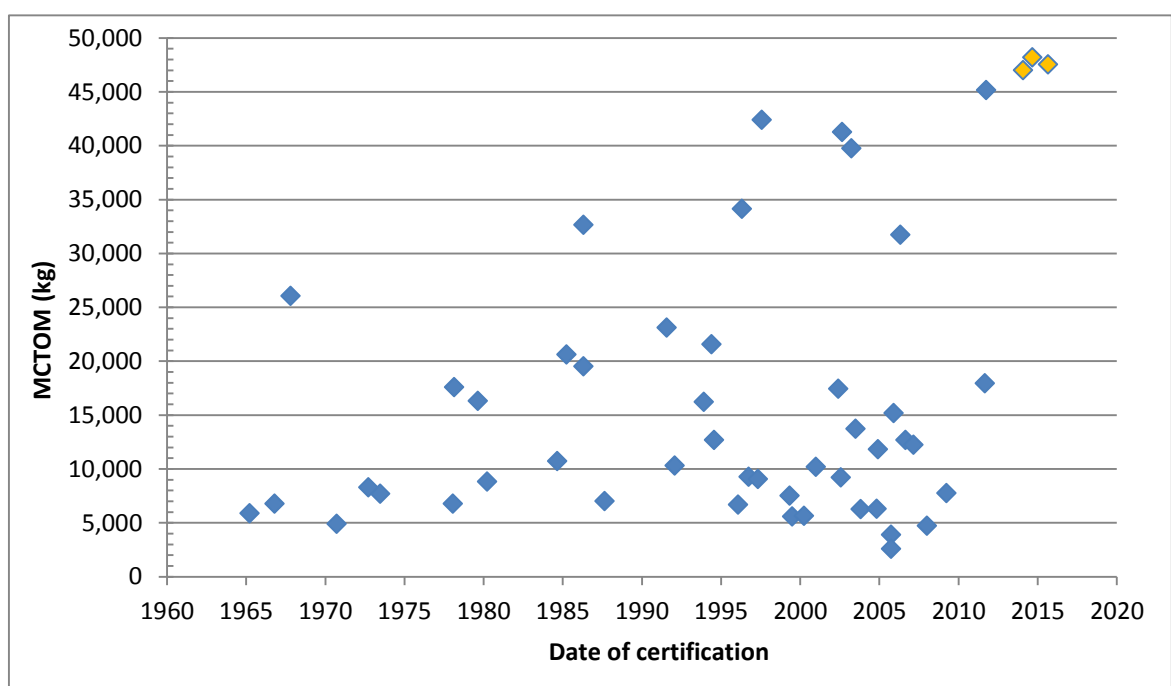


Figure 1: MCTOM at date of initial certification for business jets with an MOPSC of 19 or less

In contrast to scheduled air carrier operations, unique ETOPS considerations arise from business jet aeroplane operations, which are typically associated with non-scheduled operations. Considerations result from:

- a diverse and unpredictable combination of departure and arrival aerodromes where operations are conducted;
- a short duration of time from the announcement of departure/arrival aerodromes for which flight planning and dispatch activities must be accomplished;
- the limited availability of home base operations at departure/arrival aerodromes;
- the small fleet sizes and small number of annual flight cycles that are typical of business jet aeroplane operators.

These unique aspects of business aviation can make an ETOPS operational approval impractical for most business jet aeroplane operators due to:

- the significant maintenance and dispatch resources required to obtain and maintain an ETOPS approval:
 - flight planning capabilities (e.g. provision of meteorological information along routes and at all alternate aerodromes, adequacy and availability of all alternate aerodromes, etc.);
 - pre-departure ETOPS service checks performed by qualified personnel at all departure aerodromes;
 - ETOPS maintenance programme execution (e.g. implementation of parts control programmes, error-tolerant maintenance implementation procedures, etc.);
 - monitoring, problem reporting, investigation/resolution programmes;
- the difficulty in accumulating sufficient experience required to obtain an ETOPS operational approval using the ‘in-service’ method of ETOPS approval;
- the diminished predictive value of an OEM and an operator’s fleet average in-flight shutdown rates that result from small fleet sizes and low numbers of annual flight cycles.

This issue was reviewed with affected business jet aeroplane manufacturers and operators⁹ in coordination with the GAMA Technical Policy Committee (TPC) in fall 2013 and spring 2015 and there was general support to amend the business jet non-ETOPS operational mass threshold to accommodate the new and larger aeroplane models that were expected to enter into service. These stakeholders have considered several possible regulatory amendments and reached consensus that amending the MCTOM to accommodate currently envisioned business jets with typical performance would be the most appropriate change as it was the simplest and fastest option, which as well would not introduce any additional complexity.

EASA feels that it would not be desirable to conduct frequent ETOPS rulemakings to accommodate other future product changes, and therefore intends this proposed regulatory change to address product plans for the next 10–20 years.

Business jet manufacturers have reached consensus when processing this rulemaking task that a proposal will be made to increase the MCTOM from the current CAT.OP.MPA.140 non-ETOPS operation threshold of 45 360 to 60 000 kg (132 200 lb). This new mass threshold provides not only a consideration of future product plans, but also retains a buffer from the main scheduled airline models such as Boeing 737 (70 000 kg (154 000 lb)) configured with an MOPSC of 19 or less. This was a key consideration during the JAA non-ETOPS operation discussion to ensure that an aeroplane operated in and configured for scheduled airline operations would not be conducting non-ETOPS operations. Furthermore, non-ETOPS scheduled operations of airline aeroplanes with an MCTOM lower than 60 000 kg and an MOPSC of 19 or less is considered very unlikely.

For the purpose of this NPA, performance class A aeroplanes with MOPSCs of 19 or less are referred to as ‘business jets’ for readability reasons. Other EASA rulemaking projects have similarly introduced definitions that separately categorise business jet aeroplanes or business jet operations, including:

⁹ Bombardier, Dassault Aviation, Embraer, European Business Aviation Association, Gulfstream Aerospace Corporation, International Business Aviation Council, National Business Aviation Association, and Textron Aviation.

- RMT.0264 (MDM.066) ‘Executive Interiors Accommodation’ introduces the ‘low occupancy’ term as a mechanism to separate business jet aeroplanes from aeroplanes used in scheduled operations;
- RMT.0429 & RMT.0493 (OPS.071(b)) ‘Updating and harmonising of FTL for commercial air transport (CAT) by aeroplane for air taxi operations and single-pilot operations taking into account operational experience and recent scientific evidence’ introduces the term ‘air taxi’ to provide this segregation within the CAT regulatory framework.

A primary consideration for moving forward with a stakeholder-led rulemaking task at this time is that without this continued accommodation of non-ETOPS operations for European operators, these operators would be placed at a competitive disadvantage relative to operators based in North America and Australasia for the conduct of on-demand CAT operations with equivalent aeroplanes.

A primary reason for not using the terms from RMT.0264 (‘low occupancy’) or RMT.0429/RMT.0493 (‘air taxi’) was that both terms are tied to how a specific aeroplane is operated, as opposed to how an aeroplane model is certified. As a result, an OEM would be put in a position of having to obtain ETOPS type certification for its aeroplanes because their future use might not fit within the ‘low occupancy’ or ‘air taxi’ categories. The mass-based threshold provides the clear definition needed for type design.

4.1.3. Growing demand for large business jets and impact on diversion time thresholds

The market demand for business jets with more spacious interiors and increased mission ranges has resulted in business jets of MCTOMs approaching and exceeding 45 360 kg (100 000 lb). The current European Air OPS implementing rules prohibit the operation of such aeroplanes over routes in excess of 60-minute diversion times, unless approved for ETOPS operations. Figure 2 illustrates the range of a typical business jet aeroplane operated within 60-, 120- and 180-minute diversion time thresholds.

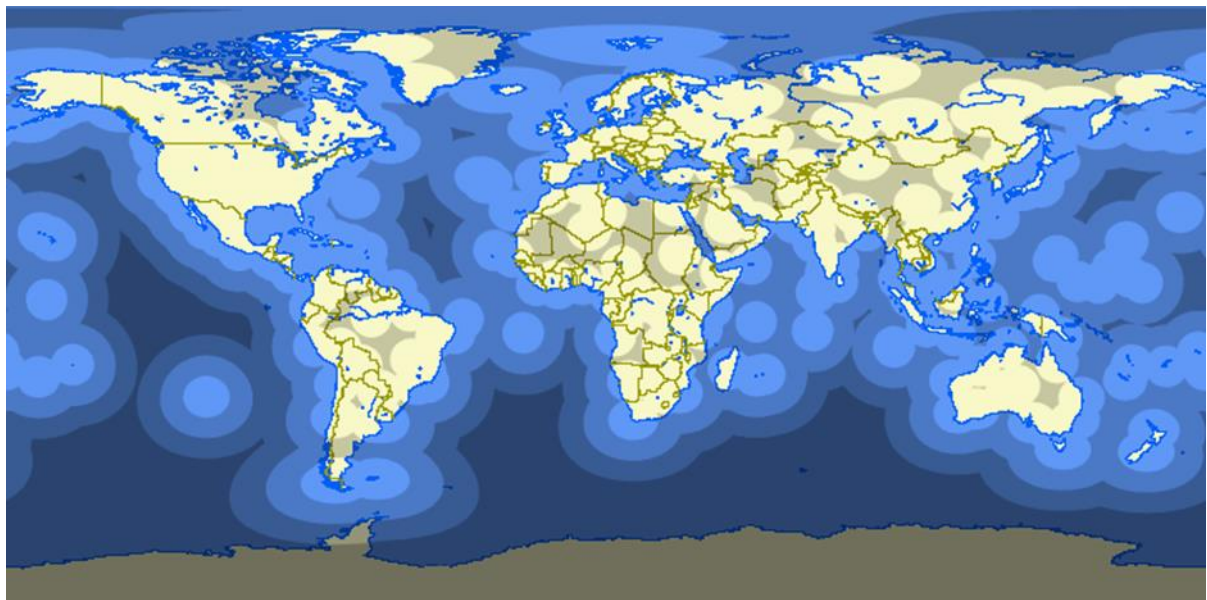


Figure 2: Typical business jet aeroplane diversion time thresholds of 60, 120 and 180 minutes using an OEI speed of 370 kt which is typical of GIV, GV, and Global 7000 data¹⁰

¹⁰ Map generated by the Great Circle Mapper (www.gcmap.com) — copyright © Karl L. Swartz, used with permission.

The underlying driver of the issue is the growth of business jet aeroplanes beyond an MCTOM not envisioned and embodied in the JAA rulemaking of the late 1990s. Industry has not only increased the size of the business jet models delivered, but has also seen the volume of larger jets grow significantly in market demand and annual deliveries to operators.

Figure 3 illustrates the market share of large aircraft as part of historical business jet deliveries from 1994 through 2013.

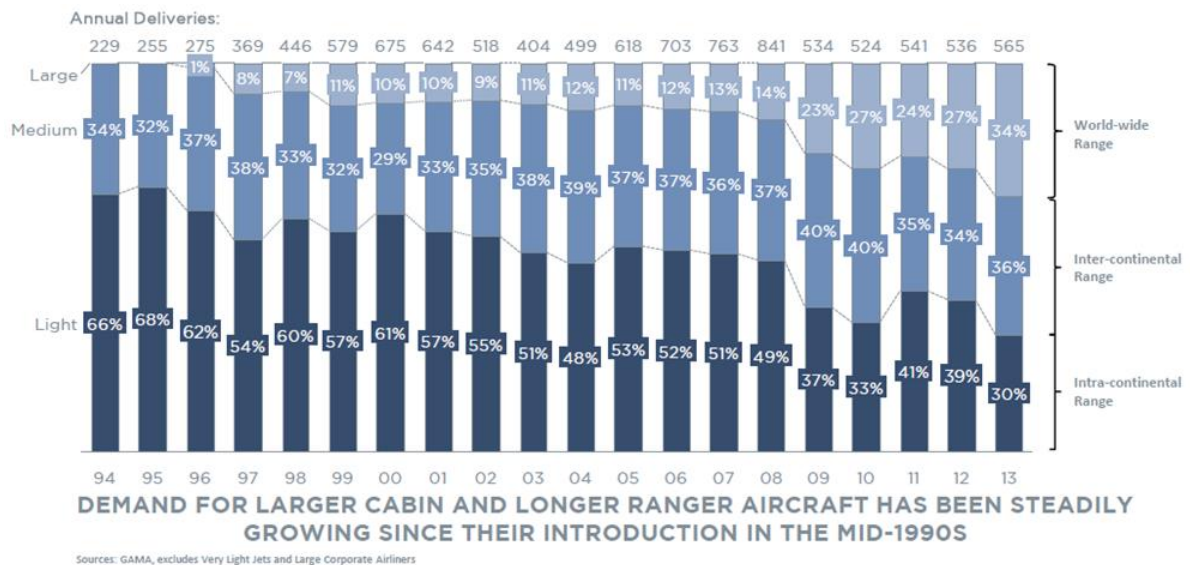


Figure 3: Historical business jet deliveries by category (1994–2013) — courtesy of Bombardier

4.1.4. Type design approval for 120–180-minute non-ETOPS operation approval

Currently, aeroplanes operated in the 120–180-minute non-ETOPS type of operations are required to be granted a type design approval, which is not addressed in the relevant certification specifications, but rather based on criteria contained in an AMC to CAT.OP.MPA.140. EASA, following the establishment of RMT.0695, also identified the need to review these existing provisions as it was identified that when JAR OPS was transposed from EU OPS into Regulation (EU) No 965/2012, an unintended change in CAT.OP.MPA.140(d) occurred, which created a technical compliance issue and uncertainty with respect to a non-ETOPS operation being subject to ETOPS type design requirements.

EASA, in response to this issue, took initially the step to propose an amendment to CAT.OP.MPA.140(d) with NPA 2015-18¹¹, which clarifies that these operations do not require an ETOPS type design approval for aeroplanes.

NPA 2015-18 (A) 'Update of the rules on air operations (Air OPS Regulation — all Annexes & related AMC/GM) — sub-NPA (A) "Draft Implementing Rule"' suggested the following amendment:

(33) Deletion of the extra space after 'Subpart F' under sub-paragraph (a) of CAT.OP.MPA.140 on maximum distance from an adequate aerodrome for two-engined aeroplanes without an ETOPS approval. Amendment of sub-paragraph (d) which sets high-level criteria for the approval referred to in CAT.OP.MPA.140(a)(2). One of the criteria is that it shall be demonstrated that the aeroplane/engine combination is capable for an operation with an extended diversion time. This demonstration, however,

¹¹ <https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2015-18>

should not require that the aircraft has been approved in accordance with ETOPS airworthiness criteria. The proposed amendment better clarifies the intent of the rule.

Furthermore, EASA, in collaboration with the RMT.0695 SLRT group, envisaged to update to the associated CSs and AMCs, which would have involved the review of AMC1 CAT.OP.MPA.140(c) and CS 25.1535, as well as the development of a new AMC 25.1535 to CS 25.1535 'ETOPS type design approval'.

However, in the course of defining these amendments, a further analysis was performed to review the basis of such a type design approval, especially in the light of the harmonisation objective with other major aviation authorities considering that this type design approval for 120–180-minute non-ETOPS operations is unique to Europe.

To support this assessment, two reports (Breiling 1 and Breiling 2, see references in Section 5.3) of business turbine-engined aeroplane accidents were considered. These reports indicated that these types of aeroplanes have proven operational capability, and showed that they have not suffered any accidents or incidents related to extended operations that would warrant additional scrutiny for either in-service or new aeroplane-engine combinations. The existing monitoring/reporting requirements are considered to ensure the continued safety of these aeroplanes and to ensure that any concerns that arise in service will be addressed. As a consequence, the possibility to remove these type design considerations for 120–180-minute non-ETOPS operations was considered as part of the envisaged options.

4.1.5. Safety risk assessment

This NPA is not the result of a safety issue identified by EASA or industry, but instead addresses level playing field, harmonisation, efficiency and proportionality matters.

Whereas the main potential benefit is time reduction and cost savings for all stakeholders, and while reinforcing the level playing field and harmonisation with other major aviation authorities, both the amended and new requirements are believed to ensure an acceptable level of safety in all areas.

The proposed amendments are based on experience with certification projects, where no negative safety records could be found (see Section 2.4), and are meant to provide for harmonisation with a partially equivalent FAA set of rules.

4.1.6. Who is affected

According to the main operator group, the European Business Aviation Association (EBAA), there are approximately 800 business aircraft operators¹² in Europe, including commercial and non-commercial operators. The European business jet fleet consisted of 2 633 aeroplanes at the end of 2014 whereas, in comparison, the worldwide fleet of business jets was 19 919 aeroplanes at that time¹³. Europe is the second largest market for business jet aeroplane deliveries and operations.

Analysis by Ascend points to approximately 67 % of European turbine-engined aeroplanes being used in CAT operations.

¹² EBAA website accessed on 5 July 2016 (<http://www.ebaa.org/en/facts-figures/quick-facts.aspx>).

¹³ JETNET/AvData.



Out of the 2 633 business jets operated in Europe, only a few of them have an MCTOM above 45 360 kg as only 1 aeroplane type with an MCTOM above 45360 kg has been certified so far (in 2014). However, as 2 other aeroplane types are being developed, it is expected that the number of aeroplanes and consequently operators affected will significantly grow in the coming years.

4.1.7. How could the issue/problem evolve

As stated earlier, the GA industry has not only increased the size of the business jet models delivered, but has also seen the volume of larger jets grow significantly in market demand and annual deliveries to operators (see Figure 3 on p. 20). Consequently, the level playing field issue described before is expected to constantly increase as more and more business jets with an MCTOM above 45 360 kg (100 000 lb) will be operated by European CAT operators.

4.2. What we want to achieve — objectives

The specific objective of this proposal is to update Regulation (EU) No 965/2012 to accommodate new business jet aeroplanes operated by European CAT operators in the 180-minute non-ETOPS operation category, in order to:

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

4.3. How it could be achieved — options

The SLRT group identified two options for accommodating new business jets with larger MCTOMs while ensuring that a level playing field is provided for European CAT operators and increasing harmonisation with other major aviation authorities.

Table 1: Selected policy options

Option No	Short title	Description
0	No policy change	Baseline option (no change to the rules; risks remain as outlined in the issue analysis).
1	Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations	Raise the non-ETOPS operation MCTOM applicability threshold cited in CAT.OP.MPA.140 from 45 360 to 60 000 kg, and remove the aeroplane type design considerations associated with the approval to operate over routes with diversion times beyond 120 minutes, and up to 180 minutes.

4.4. What are the impacts

All identified impacts are qualitatively assessed ('light' RIA) and expressed in terms of a numerical single-digit score from – 3 (highly negative) to + 3 (highly positive).

As a matter of simplicity and readability, the term 'affected operators' used throughout this impact assessment refers to European CAT operators of performance class A business jet aeroplanes with an MOPSC of 19 or less and an MCTOM in excess of 45 360 kg but not more than 60 000 kg.

With respect to the impacts described in the following sections, it is expected that Option 0 ('No policy change') will yield a small number of 'affected operators' that elect to obtain a 120- or 180-minute ETOPS operational approval, while the vast majority of 'affected operators' will not obtain any ETOPS operational approval since operators of business jet aeroplanes typically do not possess the flight operations capabilities and resources necessary to obtain ETOPS operational approvals.

4.4.1. Safety impact

Option 0 'No policy change':

With respect to the 'no policy change' option, most 'affected operators' will not be capable of acquiring ETOPS operational approvals and will limit their routes to 60-minute diversion times. A small number of 'affected operators' can be expected to obtain a 120- or 180-minute ETOPS operational approval. The reduction in diversion times and the marginal increase in approved ETOPS operations are not expected to yield any improvement in safety.

Option 1 'Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations':

Increasing the aeroplane MCTOM and removing the aeroplane type design considerations for 120–180-minute non-ETOPS operations is considered neutral in terms of safety (i.e. no change in respect of the current situation), since this option would maintain the operating environment, passenger density assumptions, and diversion time thresholds that currently exist. There is no evidence that 180-minute non-ETOPS operations (or an increase in the associated MCTOM threshold) are unsafe and especially that specific scrutiny for either in-service or new aeroplane-engine combinations is needed.

Option 0 and Option 1 are substantiated by the following:

Established safety data:

Non-ETOPS operations of business aeroplanes on routes with up to 180-minute diversion times have been conducted under JAR OPS 1.245(a)(2) for over 15 years, including the operation of business jet aeroplanes just below the current non-ETOPS MCTOM threshold of 45 360 kg.

An analysis of business turbine-engined aeroplane accidents ranging from 1964 to 1996¹⁴ was used to substantiate FAA rulemaking that would allow non-ETOPS operations with up to 180-minute diversion times for on-demand air operations¹⁵. This analysis concluded that no accidents or incidents had been

¹⁴ 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.

¹⁵ FAA Docket No. FAA-2002-6717, NPRM 2003-11.



attributed to power plant malfunctions or failures, nor to critical aeroplane components or systems that would have been subject to ETOPS approval criteria.

This analysis was repeated to account for more recent data ranging between 1996 and 2013¹⁶, and arrived at the same conclusion.

The business jet industry is a mature GA segment. The two studies (Breiling 1 and Breiling 2) point to an operational history in non-ETOPS operations that supports the current European regulatory framework for non-ETOPS operations.

Manufacturers monitor the safe operation of their aeroplanes, including the airworthiness requirements, through existing processes (e.g. 21.A.3A Failures, malfunctions and defects). The continued safety of non-ETOPS business jet operations will be subject to this monitoring.

Based on this compilation of field data, Option 1 would retain the operating environment that currently exists and would have no impact on safety risk. Conversely, Option 0 ('No policy change') and the associated decrease in diversion times/increase in approved 180-minute ETOPS operations would not increase the level of safety beyond that which currently exists.

Risk models and MCTOM:

Safety risk models previously developed and accepted by EASA for ETOPS type design approval of two-engined aeroplanes with diversion times of up to 180 minutes¹⁷ have centred on an achieved in-flight shutdown (IFSD) rate as a quantitative measure for achieving safety targets. Analysis of this risk model reveals that the safety risk is not a function of the MCTOM.

Based on existing safety risk models and their independence from the MCTOM, increasing the MCTOM as proposed by this NPA is expected to have no effect with respect to safety risk.

The comparison of options from a safety perspective is summarised in the table below:

	0	1
Options	No policy change	Amend the non-ETOPS operation MCTOM threshold and remove the type considerations for 120–180-minute operations
Safety impact	Safety will remain at the current level.	Safety will remain at the current level.
Score	0	0

¹⁶ Robert E. Breiling Associates Inc., *Business Turbine Aircraft Accidents Involving Extended Range Operations 1996 through 2013 for Bombardier Aerospace*, September, 2014.

¹⁷ NPA 2008-01 'Extended Range Operations with Two-Engined Aeroplanes ETOPS Certification and Operation (AMC 20-6)': Appendix I, Section 3 of draft amended AMC20-6. Available at <https://www.easa.europa.eu/system/files/dfu/NPA%202008-01.pdf>.

4.4.2. Environmental impact

Option 0: 'No policy change'

The option is expected to result in a negative environmental impact since the vast majority of 'affected operators' will be limited to routes with 60-minute diversion times, followed by increased fuel consumption and engine emissions.

Flight plans that deviate from the most direct route between the point of departure and destination can result in substantial increases in time aloft and fuel consumption, which in turn correspond to an increase in engine emissions and a larger environmental footprint.

The time and distance savings may be modest, albeit amassed over frequently traversed routes such as transatlantic crossings between Europe and North America. On the other hand, the time and distance savings may be substantial on some routes, such as flights between Europe and South America, or between Asia or Africa and the South Pacific.

For example, a flight between Rome, Italy, and Rio de Janeiro, Brazil, conducted within a 60-minute diversion threshold typical of business jet aeroplanes, can result in an increase of over 4 800 NM compared to the great circle route (i.e. the shortest distance between two points on the Earth), which could otherwise be achieved using 120- or 180-minute diversion thresholds.

Another example, a flight between Cape Town, South Africa, and Bangkok, Thailand, conducted within a 60-minute diversion threshold typical of business jet aeroplanes can result in an increase of over 1 400 NM compared to the great circle route (i.e. the shortest distance between two points on the Earth), which could otherwise be achieved using 120- or 180-minute diversion thresholds. Similarly, a flight between Tokyo, Japan, and Auckland, New Zealand, conducted within a 60-minute diversion threshold can result in an increase of over 1 100 NM compared to the great circle route.

Option 1 'Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations':

Increasing the applicable MCTOM applicability threshold will maintain the current non-ETOPS operation considerations and associated flight planning flexibility provided to business jet aeroplanes, including 'affected operators'. Option 1 is considered neutral in terms of environmental impact, because it will help avoid an increase in engine emissions due to the enabled possibility for the operators to fly more direct routes.



The comparison of options from an environmental impact perspective is summarised in the table below:

Options	0	1
	No policy change	Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations
Environmental impact	Environmental impact will worsen due to increased aircraft emissions and fuel consumption associated with restricted diversion times.	Environmental impact will remain at the current level.
Score	– 1	0

4.4.3. Social impact

No social impact is expected for any of the options.

4.4.4. Economic impact

Option 0 ‘No policy change’:

The option is expected to result in a negative economic impact on European business aviation operators and the European business aviation market.

‘Affected operators’ that elect to obtain ETOPS operational approval can expect to incur additional costs, either in-house or under contract to maintenance and flight dispatch organisations, associated with:

- initial and recurring training and qualification programmes (e.g. flight crew and maintenance);
- flight planning capabilities (e.g. provision of meteorological information along routes and at all alternate aerodromes, adequacy and availability of all alternate aerodromes, etc.);
- executing ETOPS maintenance programmes (e.g. implementation of parts control programmes, error-tolerant maintenance implementation procedures, etc.);
- pre-departure ETOPS service checks performed by qualified personnel at all departure aerodromes; and
- monitoring, problem reporting, investigation/resolution programmes.

Such ‘affected operators’ with fare-paying customers could offset the costs associated with ETOPS operational approvals by increasing fares; however, the same net expenditure would be required to maintain the existing business jet aeroplane operating environment and the level of service that is expected from business aviation. For this reason, maintaining the existing Air OPS implementing rules is perceived to have a negative economic impact on European CAT operators.

The majority of 'affected operators' are smaller entities, which typically do not have the flight operations capabilities to obtain ETOPS operational approvals, and for which the outsourcing of services is not economically viable. These operators will be limited to non-ETOPS operations over routes with 60-minute diversion thresholds, which will result in fewer destinations being offered, additional time aloft, additional fuel consumption, and additional refuelling stops. These implications are contrary to the ethos of business aviation and are expected to have a significant negative impact on the competitiveness, and economic viability, of such 'affected operators'.

Clearly, maintaining the existing Air OPS implementing rules will introduce a considerable market distortion amongst European business aviation operators, determined by the MCTOMs of an operator's business jet aeroplanes.

In addition to an un-level playing field created within the European business aviation market, the existing Air OPS implementing rules will also create a bias against European business aviation operators on an international level. Specifically, several international authorities establish ETOPS diversion time thresholds via means other than the MCTOM of the aeroplane (see Section 2.3.4.6 of this NPA), so that a 19-passenger business jet aeroplane with an MCTOM in excess of 45 360 kg might not be subject to ETOPS approval on routes with up to 180-minute diversion thresholds.

As for airframe and engine manufacturers, those manufacturers who choose to obtain ETOPS airworthiness approvals for their products can expect to incur additional costs associated with the development, testing, and problem tracking/resolution responsibilities associated with ETOPS approvals. However, the decision to certify airframes and engines for ETOPS would be based on a business case that offsets the certification costs.

EASA and individual Member States would also incur the cost of completing an actual ETOPS approval to certify a design and obtain operational approvals for each operator that would conduct CAT operations with large business jets.

In addition, this option is expected to have a negative economic impact on small and medium-sized operators. The vast majority of business jet aeroplane operators that are based in Europe meet the European Union definition of small to medium-sized enterprises (SME) in that they employ fewer than 250 persons and have an annual turnover not exceeding 50 million euros. The option will result in a significant negative effect on SMEs when business jet aeroplanes are operated in CAT operations. In contrast to large enterprises, SME operators typically do not have the flight operations capabilities required to obtain ETOPS operational approval.

Option 1 'Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations':

The option to 'amend CAT Air OPS IRs' will maintain the existing operating environment and is considered positive in terms of economic impact.

Operators of aeroplanes with an MCTOM above 45 360 kg will be able to operate up to 180 minutes from an adequate aerodrome without an ETOPS approval, which will reduce the economic burden on these operators.



Furthermore, manufacturers of business jet aeroplanes will benefit from the removal of the design considerations related to the aeroplane capability to be operated between 120 and 180 minutes from an adequate aerodrome.

Increasing the applicable MCTOM applicability threshold will reflect the business aviation operating environment ensuring that the rules are proportionate for small and medium-sized operators.

The comparison of options from an economic impact perspective is summarised in the table below:

Options	0	1
	No policy change	Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations
Economic impact	Negative economic impact on European business aviation operators and the European business aviation market.	Economic impact will be positive for operators and manufacturers.
Score	– 2	2

4.4.5. General Aviation and proportionality issues

No impact on the GA is expected, since the task does not address directly/indirectly the GA.

The proposed regulatory amendment is only directly applicable to CAT operations. These types of aeroplanes are also operated in GA operations under non-commercial operations with complex motor-powered aircraft (NCC) rules in a number of EU Member States, in which no similar mass threshold to that identified in CAT.OP.MPA.140 exists.

As regards proportionality, the related issues on the impact on small and medium-sized operators are already discussed in the economic impact.

4.4.6. Impact on ‘better regulation’ and harmonisation

For the development of this NPA, the SLRT group has reviewed existing regulations and standards of other regulators and ICAO with respect to the CAT operation of business jet aeroplanes and the applicable non-ETOPS operation diversion time thresholds, which are summarised below.

ICAO: Both Option 0 (‘No policy change’) and Option 1 (‘Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations’) are aligned with EASA’s obligations towards ICAO. Specifically, ICAO Annex 6, Part I, Chapter 4.7.2.1, states that the threshold time should be established by the State of the Operator, which is a Union competence.

Chapter 4.7.2 Requirements for extended diversion time operations (EDTO)

(...)



4.7.2.1 Unless the operation has been specifically approved by the State of the Operator, an aeroplane with two or more turbine engines shall not be operated on a route where the diversion time to an en-route alternate aerodrome from any point on the route, calculated in ISA and still-air conditions at the one-engine-inoperative cruise speed for aeroplanes with two turbine engines and at the all engines operating cruise speed for aeroplanes with more than two turbine engines, exceeds a threshold time established for such operations by that State.

The term ‘**threshold time**’ is defined in ICAO Annex 6, Part I, as:

The range, expressed in time, established by the State of the Operator to an en-route alternate aerodrome, whereby any time beyond requires an EDTO approval for the State of the Operator.

...and the term ‘**extended diversion time operations (EDTO)**’ is defined as:

Any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the State of the Operator.

Both Option 0 and Option 1 of this NPA would result in a threshold time being established by EASA beyond which an EDTO (ETOPS) approval would be required, and this therefore maintains alignment with ICAO Annex 6, Part I.

Australia: Civil Aviation Order (CAO) 82.0, *Air Operators’ Certificates – applications for certificates and general requirements*, addresses both regular public transport operations and charter operations, and establishes non-EDTO threshold times based on certified passenger seating capacity, maximum payload capacity, and MCTOM.

For aeroplanes typical of business aviation — that is, twin-turbine-engined aeroplanes certified to carry a maximum of 19 passengers, with an MCTOM in excess of 5 700 kg — the non-EDTO threshold time is established as 180 minutes via CAO 82.0 section 3BB and the associated definitions of ‘EDTO’ and ‘threshold time’¹⁸. Furthermore, the approval referred to in subsection 3BB and detailed in Appendix 3 to CAO 82.0 does not address an aeroplane type design approval.

Option 0 (‘No policy change’) will keep the lack of harmonisation with Australian regulations unchanged in that ‘affected operators’ operating in accordance with CAO 82.0 subsection 3BB would continue to make use of 180-minute non-ETOPS operation threshold times, while ‘affected operators’ operating in accordance with Regulation (EU) No 965/2012 would be limited to 60-minute time thresholds.

Option 1 (‘Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations’) would increase harmonisation with the Australian Air Operations regulations.

Canada: The Canadian Aviation Regulations (CARs) for CAT operations differentiate between CAR 705 (airline operations) and CAR 703/704 (air taxi/commuter operations).

¹⁸ See also CAO 82.0 subsection 3BA through 3BD for threshold times established for the operation of aeroplanes that are beyond the scope of this NPA and its analysis.

With respect to aeroplanes, CAR 705 applies to aeroplanes that have a maximum certified take-off weight (MCTOW)¹⁹ of more than 8 618 kg (19 000 lb) or for which a Canadian type certificate has been issued authorising the transport of 20 or more passengers, unless authorised for operation under CAR 704.

With respect to aeroplanes, CAR 704 applies to: (a) multi-engined aeroplanes that have an MCTOW of 8 618 kg (19 000 lb) or less and a seating configuration, excluding pilot seats, of 10 to 19 inclusive; (b) turbo-jet-powered aeroplanes that have a maximum zero fuel weight of 22 680 kg (50 000 lb) or less and for which a Canadian type certificate has been issued authorising the transport of not more than 19 passengers; or (c) any aeroplane that is authorised by the Minister to be operated under this Subpart. The provisions of (c) are often applied to business jet aeroplanes with a passenger seating configuration of 19 or less that exceed the MCTOW and/or MZFW applicability thresholds of CAR 704.

With respect to aeroplanes, CAR 703 applies to: (a) a single-engined aircraft; (b) a multi-engined aircraft, other than a turbo-jet-powered aeroplane, that has an MCTOW of 8 618 kg (19 000 lb) or less and a seating configuration, excluding pilot seats, of nine or less; or (c) any aircraft that is authorised by the Minister to be operated under this Subpart.

Non-ETOPS operation threshold times are established via CAR 705.26, which states that no air operator shall operate a twin-engined aeroplane on a route containing a point that is farther from an adequate aerodrome than the distance that can be flown in 60 minutes at the one-engine-inoperative cruise speed, unless specific ETOPS criteria are satisfied or the flight is conducted wholly within Canadian Domestic Airspace^{20,21}.

CARs do not establish ETOPS threshold times based on a maximum weight/mass, because their regulatory framework allows for the differentiation between large scheduled (i.e. CAR 705) and small unscheduled operators (i.e. CAR 703/704) independent of the aeroplane size. Despite the differences in regulatory structure, the net effect of the CARs effectively aligns with the current provisions of Regulation (EU) No 965/2012 on non-ETOPS operations with business jet aeroplanes.

Option 0 ('No policy change') will keep the lack of harmonisation with the Canadian Air Operations regulations unchanged in that European operators of business jet aeroplanes of MCTOM in excess of 45 360 kg would not be able to make use of the non-ETOPS operation considerations intended for large business jet aeroplanes.

Option 1 ('Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations') would increase harmonisation with the Canadian Air Operations regulations.

New Zealand: The Civil Aviation Rules (CARs) of New Zealand for CAT operations differentiate between Part 121 (air operations — large airplanes) and Part 125 (air operations — medium airplanes).

¹⁹ The relevant Canadian and New Zealand regulations make reference to weight instead of mass.

²⁰ Technical criteria for ETOPS are contained in TP 6327 — Safety Criteria for Approval of Extended Range Twin-engine Operations (ETOPS) Manual.

²¹ Air taxi and commuter operations are not regulated by explicit threshold times set out in CAR 703/704.

Part 121 prescribes rules governing air transport operations and commercial transport operations using an aeroplane having a seating configuration of more than 30 seats, excluding any required crew member seat, or a payload capacity of more than 3 410 kg²².

Part 125 prescribes rules governing air operations using an aeroplane: (1) having a passenger seating configuration of 10 to 30 seats; (2) with a payload capacity of 3 410 kg or less and an MCTOW greater than 5 700 kg; or (3) to perform passenger operation under IFR rules with a single-engined aeroplane (see CAR 125.1 for the full regulatory text)²³.

Non-ETOPS operation threshold times are established via CAR 121.165, which effectively limit non-ETOPS operation time thresholds to 60 minutes for piston- and twin-turbine-engined aeroplanes, and 180 minutes for aeroplanes with more than two turbine-powered engines²⁴.

CARs do not establish ETOPS threshold times based on a maximum weight/mass, because their regulatory framework allows for the differentiation between large scheduled (i.e. CAR 121) and small unscheduled operators (i.e. CAR 125) independent of the aeroplane size. Despite the differences in regulatory structure, the net effect of the CARs effectively aligns with the current provisions of Regulation (EU) No 965/2012 on non-ETOPS operations with business jet aeroplanes.

In consideration of emerging aeroplanes, Option 0 ('No policy change') will keep the lack of harmonisation with the Air Operations regulations of New Zealand unchanged in that 'affected operators' operating in accordance with CAR 125 would not be limited to 60-minute non-ETOPS operation threshold times, which is in contrast to 'affected operators' operating in accordance with Regulation (EU) No 965/2012.

Option 1 ('Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations') would increase harmonisation with the regulations of New Zealand.

United States: The US FAA differentiates its CAT operations between 14 CFR Part 121 (scheduled commercial) and Part 135 (air taxi/on-demand operations). Business jet aeroplanes are exclusively operated in Part 135 operations when conducting operations for remuneration or hire (i.e. CAT operations).

Operators conducting Part 135 operations in the United States are subject to §135.364 'Maximum flying time outside the United States', which prohibits a certificate holder (the operator) from operating an airplane 'other than an all-cargo airplane with more than two engines, on a planned route that exceeds 180 minutes flying time (at the one-engine-inoperative cruise speed under standard conditions in still air) from an Adequate Airport outside the continental United States unless the operation is approved by the FAA in accordance with Appendix G of this part, Extended Operations (ETOPS).'

²² CAA of New Zealand, Civil Aviation Rules, Part 121, subsection 1.

²³ CAA of New Zealand, Civil Aviation Rules, Part 125, subsection 1.

²⁴ Air operations of medium-sized aeroplanes are not regulated by explicit thresholds times set out in Part 125.

The US FAA does not limit non-ETOPS operations based on a take-off weight/mass threshold, because its regulatory framework allows for the differentiation between large scheduled (i.e. Part 121) and small unscheduled operators (i.e. Part 135) independent of the aeroplane size.

The intent of the existing regulatory applicability at 45 360 kg MCTOM threshold was to harmonise European with other regulatory frameworks while not having the ability to differentiate scheduled CAT operations from on-demand CAT operations using business jets. The three new business jet aeroplanes that have an MCTOM in excess of 45 360 kg will be operated by Part 135 certificate holders in the United States, if conducting CAT operations, and raising the MCTOM threshold as proposed in 'Option 1' will maintain regulatory harmonisation. Option 0 ('No policy change') will keep the lack of harmonisation with 14 CFR Part 135 unchanged.

The comparison of options from a harmonisation perspective is summarised in the table below:

Options	0	1
	No policy change	Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations
Impact on 'better regulation' and harmonisation	The current lack of harmonisation with other regulators for operations using these aeroplanes will continue.	Increases harmonisation with other regulators for these aeroplanes.
Score	0	+ 2

4.5. Conclusion

4.5.1. Comparison of options

The scores assigned above using the multi-criteria analysis (MCA) methodology are algebraically summed:

Options	0	1
	No policy change	Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations
Types of impacts	Score	
Safety	0	0

Environment	- 1	0
Economic impact	- 2	+ 2
Regulatory harmonisation	0	+ 2
Total	- 3	+ 4

Option 0 ('No policy change') is expected to result in negative environmental and economic impacts. No safety, social or harmonisation impact is expected.

Option 1 ('Amend the non-ETOPS operation MCTOM threshold and remove the type design considerations for 120–180-minute operations') would simply extend the current non-ETOPS operation considerations and operating environment to include CAT operators of business jet aeroplanes with an MCTOM in excess of 45 360 kg, and would induce a positive impact.

The removal of the type design considerations related to the aeroplane capability to be operated between 120 and 180 minutes from an adequate aerodrome contributes as well to the global positive impact of Option 1.

Clearly, Option 1 is EASA's preferred one and is selected as the basis for rulemaking.

4.6. Monitoring and evaluation

Monitoring is a continuous and systematic process of data collection and analysis about the implementation/application of a rule/activity. It generates factual information which enables future evaluation and impact assessments and helps to identify actual implementation problems. With respect to this proposal, EASA would suggest to monitor the following:

Indicator	When it will be monitored	How it will be monitored	Who will be in charge of the monitoring
Related findings from standardisation inspections	Annually	Via standardisation inspections	EASA Flight Standards Department (FS.5)
Notified Article 14 flexibility provisions and outcome of the related EASA assessment	Annually	Via internal Article 14 database	EASA Flight Standards Department (FS.5)
Number of related AltMoC notified	Annually	Via internal AltMoC database	EASA Flight Standards Department (FS.5)

In addition, monitoring will be performed in terms of collecting and analysing data from different available sources through several tools (e.g. safety analysis). The responsible actors for collecting and providing the data (e.g. Member States, national authorities, operators, etc.) will be further specified in the implementation phase.

Furthermore, the proposal might be subject to interim/ongoing/ex post evaluation, which will allow to compare the impact of the new requirements with the earlier predictions made in this impact assessment. The evaluation will provide an evidence-based judgement of the extent to which the proposal has been relevant (given the needs and its objectives), effective and efficient, coherent, and has achieved EU added-value. The decision whether an evaluation will be necessary will be taken based also on the monitoring results.



5. Proposed action to support implementation

No specific implementation issue is expected as the proposal doesn't add any additional requirement to the current regulatory framework. Therefore, no specific action is foreseen to support implementation.



6. References

6.1. 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

6.2. Affected decisions

- 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° 2010/016/R of the Executive Director of the Agency of 16 December 2010 amending the Annex to Decision No. 2003/01/RM of the Executive Director of the Agency of 17 October 2003 on Acceptable Means of Compliance and Guidance Material for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations («AMC and GM to Part-21») — 'Extended Range Operations with Two-Engined Aeroplanes ETOPS Certification and Operation', 'Systematic review and transposition of existing FAA TSO standards for parts and appliances into EASA ETSO' and 'Other party supplier control'

6.3. Other reference documents

- International Civil Aviation Organisation (ICAO), Annex 6 to the Convention on International Civil Aviation, Part I: International Commercial Air Transport — Aeroplanes, 9th Edition, Amendment 36
- 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
- Federal Aviation Administration, Title 14 of the Code of Federal Regulations
 - Part 135 Operating Requirements: Commuter and On-Demand Operations and Rules Governing Persons on board such Aircraft, Subpart I – Airplane Performance Operating Limitations, Sec. 135.364 – Maximum flying time outside the United States, Amendment 135-108



- Subpart H--Aircraft Requirements, Part 121 Operating Requirements: Domestic, Flag and Supplemental Operations, Sec. 121.161 - Airplane limitations: Type of route, Amendment 121-329
- 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



7. Appendices

7.1. Main acronyms used

AMC	acceptable means of compliance
APU	auxiliary power unit
CAT	commercial air transport
CRD	comment-response document
CSs	certification specifications
EDTO	extended diversion time operations
ERA	en-route alternate
ETOPS	extended range operations with two-engined aeroplanes
FAA	Federal Aviation Administration
FCL	flight crew licensing
GM	guidance material
ICAO	International Civil Aviation Organisation
IFSD	in-flight shutdown
IR	implementing rule
OEI	one-engine-inoperative
MCTOM	maximum certified take-off mass
MDA/H	minimum descent altitude/height
MEL	minimum equipment list
MOPSC	maximum operational passenger seating configuration
NCC	non-commercial operations with complex motor-powered aircraft
NPA	notice of proposed amendment
RIA	regulatory impact assessment
SLRT	stakeholder-led rulemaking task
TAF	terminal area forecast
TAG	Thematic Advisory Group
TC	type certificate
TCCA	Transport Canada Civil Aviation

