European Aviation Safety Agency
Rulemaking Directorate

EXPLANATORY NOTE

AMC-20 Amendment 7

1. GENERAL

Executive Director Decision 2010/012/R amends Decision No 2003/12/RM of 5 November 2003 (AMC 20 Initial Issue) as last amended by the Executive Director Decision 2010/003/R of 26 July 2010.

The Notice of Proposed Amendment (NPA 2008-01) has been subject to consultation in accordance with Article 52(1)(c) of the Basic Regulation[1] and articles 5(3) and 6 of the Rulemaking Procedure established by the Management Board[2].

2. CRD REACTIONS

In response to the CRD 2008-01, the Agency received the following substantive comments to AMC 20-6 rev. 2, which are reproduced below together with the Agency's position.

[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, 19.03.2008, p. 1). Regulation as last amended by Regulation 1108/2009 of the European Parliament and of the Council of 21 October 2009 (OJ L 309, 24.11.2009, p. 51).

[2] Management Board decision concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material ('Rulemaking Procedure'), EASA MB 08-2007-03, 13.6.2007.

CRD comment no.	Commenter	Reaction	EASA response
1	Swiss International Airlines/ Bruno Pfister	SWISS Intl Air Lines takes note of the CRD to NPA 2008-01 without further comments.	Noted. The Agency thanks the commenter for the reaction.
2	Baines Simmons Ltd	**Page 28 of CRD response to comment#187 (Airbus)** The JAA ETOPS Gorking Group maintenance sub-group introduced the concept of monitoring the condition of cargo compartment liners (and other fire containment features) in response to maintenace inspection data that showed that current Maintenance Programmes were not adequate to ensure that a fire could contained and suppressed. Reliability monitoring systems were not providing data on which the operatots could act as they typically did not include this element of the inspection programme. We identified that the assumption that design features would protect aircraft occupants from a prolonged fire in baggage compartments were dangerously flawed. The Maintenance Programme was demonstrably not maintaining design features in service. We felt that the failure to contain a fire over an extended period was a real and significant risk. The group agreed that a reliability monitoring approach would provide operators with accurate data on the rate and extent of damage and enable them to take appropriate action to minimise or reduce such damage.	AMC 20-6 Appendix 8 section 3.1 has been amended to include a requirement for the maintenance programme to contain tasks to maintain the integrity of cargo compartment and pressurisation features.

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3	Baines Simmons Ltd	**Page 28 of CRD response to comment #83 by Boeing** The JAA ETOPS Working Group Maintenance sub-group generated this material to reflect a known problem with the maintenance of cabin pressure retention features. We felt that the assumption that an aircraft can maintain cabin pressure, with a degraded pneumatic system over high ground during a drift down, was flawed. The experience of the sub-group memebrs and inspection data showed that a significant proportion of cabin pressure decay rate checks were failed, in some cases to the extent that a single engine was unable to maintain cabin pressure in flight. This would be most critical when operating over high ground. A risk exposure assessment may identify that this may not be an ETOPS specific issue. From memory, the group identified mountainous geographical areas where ETOPS rules applied and an assumption of cabin pressure retention facilitated a controlled aircraft altitude drift down. We felt that operators would benefit from reliability-type data on decay rate checks, enabling them to address any accelerated degradation. This data was not available from the reliability systems reviewed during the rule-making process. The aim of this material was to enable the continuing	AMC 20-6 Appendix 8 section 3.1 has been amended to include a requirement for the maintenance programme to contain tasks to maintain the integrity of cargo compartment and pressurisation features.

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		airworthiness management system to effectively maintain design features throughout the life of an aircraft.	
4	KLM Plaisier, Gerrit Jan	**On top of page 179 of the CRD resulting text is stated:** For all routes where voice communication facilities are available, the communication equipment required by operational requirements should include at least one voice-based system. This is unclear and should be reworded. Voice is still required worldwide, so only additional means like CPDLC could be an extra requirement, if that is what is intended here, but the text is unclear.	The text is in line with EUOPS 1.865 (g) and Appendix 4 section 3 of this AMC. The requirement expresses the fact that whenever voice communications are available, then there should be at least one voice system.
5	KLM	**CRD page 179 paragraph 7.2.1 is said:** If the airframe/engine combination does not yet have a Type Design approval for at least 90 minutes diversion time, the aircraft should satisfy the relevant ETOPS design requirements. Please make clear what the relevant ETOPS design requirements are.	The relevant ETOPS requirements refer to the requirements that would be applicable to the aircraft type if ETOPS certification would have been required at that time.
6	KLM	**page 210 of resulting text in CRD chapter 10 - d.** Typo daltitude capability... The d to be deleted.	The Agency thanks the commenter for the reaction. Typo corrected.
7	KLM	**page 213 of resulting text of CRD:**	The Agency thanks the commenter for the reaction.

<table>
<tr><th>CRD comment no.</th><th>Commenter</th><th>Reaction</th><th>EASA response</th></tr>
<tr><td></td><td></td><td>-part 2 above the table is a repetition of what is stated in part 1-c.
This has to be deleted as unnecessary.</td><td>Repeated paragraph deleted as proposed by the commenter.</td></tr>
<tr><td>8</td><td>KLM</td><td>page 213 of resulting text of CRD:

The table shall also include RNP APCH as PBN is implemented worldwide as from this year.
Since this is an AMC this is not interfering with EU.OPS and it has to be included into the NPA as addition because if not done now PBN will be implemented completely when all this becomes valid.
Therefore a good start is to include the minima for these procedures already for ETOPS and copy into EU.OPS?EASA.OPS.
Therefore the table should read:

<table>
<tr><th>Approach Facility</th><th>Ceiling</th><th>Visibility</th></tr>
<tr><td>Precision Approach</td><td>Authorised DH/DA plus an increment of 200 ft</td><td>Authorised visibility plus an increment of 800 metres</td></tr>
<tr><td>RNP APCH APV</td><td>Authorised DH/DA plus ans increment of 300ft</td><td>Authorised visibility plus an increment of 1000 mtr</td></tr>
<tr><td>Non-Precision Approach or Circling approach</td><td>Authorised MDH/MDA plus an increment of 400 ft</td><td>Authorised visibility plus an increment of 1500 metres</td></tr>
</table>
</td><td>The proposed amendment is not compatible with OPS 1.297.

AMC 20-6 describes a means to obtain the operational approval required by OPS 1.246, therefore the AMC 20-6 cannot contain different minima than OPS 1.297.
In addition APV approaches cannot be considered precision approaches and other minima for APV approaches should be established. This aspect may be part of further analysis in a future task which would envisage aligning AMC 20-6 with future part-OPS and part-SPA.</td></tr>
</table>

CRD comment no.	Commenter	Reaction	EASA response
9	KLM	**page 223 of resulting text in CRD:** f. performance requirements shall not be included in part C where aerodrome and route info is specified.	The intent was to refer to aerodrome characteristics (LDA, TODA). Text has been reworded.
10	KLM	**appendix 7 page 217 and on in the resulting text of CRD:** Only an operations manual supplement is given here, but the option to have a dedicated ETOPS manual has to be allowed as well. This has to be specified as posibility.	Appendix 7 has been amended to reflect the fact that the ETOPS operations manual can take the form of a supplement or a dedicated manual.
11	KLM	**page 226 of resulting text in CRD** 3.2.3 apu in lfight start programme; says that after the programme is proven that it may be allieviated. There should be added 'or ceased'.	An APU in-flight start monitoring programme should be maintained to ensure that the APU start reliability continues to meet the required rate.
12	UK CAA	**Page 153 of CRD Paragraph No (a) (2) (iii)** **Comment:** This requires that the approved single engine inoperative cruise speed must be used to establish the level off altitude. This level off altitude must clear all obstacles en route by margins …. **Justification:** Contradictory. **Proposed Text:** Change text to read: "A speed other than the approved one-engine inoperative speed may be used as the basis for compliance with the en-route **altitude** requirements **Page 179 of CRD Paragraph No 7.2 Specific**	First comment: Accepted, text amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		Requirements **Comment:** Where "time limited system capability minus 15 minutes" is specified, "(for the approach procedure)" is added in some places, in others it is not. **Justification:** Consistency. **Page 209 of CRD Paragraph No 5 Alternate Aerodromes** **Comment:** The second paragraph does not cater for the case where weather conditions at the destination or departure aerodrome when considered as a destination would require two alternates. Also, it would appear to allow an ETOPS diversion to a departure/destination alternate which could exceed the Maximum Approved Diversion Time or the Time-Limited System Capability. **Proposed Text:** Delete second paragraph. **Page 222 of CRD Paragraph No Part B b. (2)** **Comment:** Elsewhere the decompression procedures during ETOPS are mentioned but are not included in the required instructions for crew. **Proposed Text:** Add text **"(3) Procedures to follow in the event of a decompression."**	Second comment: AMC 20-6 Section 7.2.3 APPROVAL FOR DIVERSION TIME ABOVE 180 MINUTES, the text "(for the approach procedure)" has been deleted for consistency reasons. Comment accepted. Paragraph deleted. Fourth comment: Decompression procedures are required for any flight and they are not specific for ETOPS flights. Consequently, they should be part of the standard operations manual and are not mentioned in AMC 20-6 Appendix 7, Part B. Decompression procedures would have to be

CRD comment no.	Commenter	Reaction	EASA response
			incorporated in the Part B of the operations manual and not particularly in the ETOPS supplement.
13	FAA	**page # 41. Comment #307** The FAA does not agree with the concept of an incomplete maintenance program before ETOPS authorization. Deke Abbott, Aviation Safety Inspector, AFS-220. Washington, D.C.	It is considered that the competent authority may approve an incomplete aircraft maintenance programme for the start of operation in a controlled manner.
14	Boeing	**Page number: 154** **Re Comment number: 93, others** Chapter I General Considerations Section 4 Terminology a. Approved One-Engine-Inoperative Cruise Speed New text: **"Note: The diversion distance based on the approved one-engine-inoperative cruise speed may take into account the variation of the True Air Speed."** --- Boeing suggests that the following changes be made to the highlighted text: Note: The diversion distance based on the approved one-engine-inoperative cruise speed may take into account the variation of the True Air Speed **during the engine inoperative driftdown to thrust limited altitude**.	The reference to comment 93 is not understood. We do not see the need to introduce the additional text proposed.

CRD comment no.	Commenter	Reaction	EASA response
		JUSTIFICATION: Without this clarification, operators may introduce other, unintended variations of air speed.	
15	Boeing	**Page number: 164** **Re Comment number: 171 and newly added text** *Chapter II TYPE DESIGN APPROVAL CONSIDERATIONS SECTION 7: EVALUATION CRITERIA OF THE ETOPS TYPE DESIGN...* *"(10) It should be shown that adequate status monitoring information and procedures on all ETOPS significant systems are available for the flight crew to make pre-flight, in-flight go/no-go and diversion decisions.* *Adequate fuel quantity information should be available to the flight crew, including alerts, and advisories, that consider the fuel required to complete the flight, abnormal fuel management or transfer between tanks, and possible fuel leaks in the tanks, the fuel lines and other fuel system components and the engines."* ---------- Boeing comment: The new text does not provide sufficient guidance on what *"adequate fuel quantity information"* is, and while the original intent was that this section of AMC 20-6 would be harmonized with FAA's 14 CFR Part 25, Appendix K25.1.4(a)(3), that has not been the case.	The definition of adequate fuel quantity information affects not only ETOPS aircraft and operations. Therefore, rulemaking task 25.055 Fuel System Low Level Indication/Fuel Exhaustion has been set to provide additional guidance on the low level fuel alert. The outcome of this task may be taken into account in a future task which would envisage aligning AMC 20-6 with future Part-OPS and Part-SPA.

CRD comment no.	Commenter	Reaction	EASA response
		Additional guidance materials are needed that harmonize acceptable means of compliance between the FAA and EASA. JUSTIFICATION: The lack of consistent application and interpretation of FAA and EASA standards regarding acceptable means of compliance for adequate fuel quantity information and alerts creates conditions for disparate design and/or procedural solutions among airplane manufacturers. Harmonization is necessary to provide consistent application of requirements across applicants and agencies.	
16	Boeing	**Page number: 164** **Re Comment number: Unknown; newly added text** Chapter II TYPE DESIGN APPROVAL CONSIDERATIONS SECTION 7: EVALUATION CRITERIA OF THE ETOPS TYPE DESIGN *"(12) Time-limited system* *In addition to the Maximum Approved Diversion Time, diversion time may also be limited by the capacity of the cargo hold fire suppression system or other time-limited systems determined by considering other relevant failures, such as an engine inoperative, and combinations of failures not shown to be extremely improbable. ..."* Boeing suggests that the following changes be made:	The text has been amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		"In addition to the Maximum Approved Diversion Time, diversion time may also be limited by the capacity of the cargo hold fire suppression system or other **ETOPS significant** time-limited systems determined by considering other relevant failures, such as an engine inoperative, and combinations of failures not shown to be extremely improbable. …" JUSTIFICATION: There may be time-limited systems that are not ETOPS significant, and thus not relevant here.	
17	Boeing	**Page number: 164** **Re Comment number: Unknown; newly added text** *Chapter II TYPE DESIGN APPROVAL CONSIDERATIONS SECTION 7: EVALUATION CRITERIA OF THE ETOPS TYPE DESIGN* *"(13) Operation in icing conditions* *…* *(ii) The aeroplane should be capable of continued safe flight and landing in icing conditions at depressurisation altitudes with one engine inoperative."* Boeing suggests that the following changes be made: … "(ii) The aeroplane should be capable of continued safe flight and landing in icing conditions at depressurisation altitudes **or** ~~with one~~ engine inoperative **altitudes**."	The text has been amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		JUSTIFICATION: To be consistent (harmonize) with the FAA, operation in icing conditions must consider: depressurization altitude with both engines operating or one-engine-inoperative altitude, but not depressurization altitude with one engine inoperative.	
18	Boeing	**Page number: 165** **Re Comment number: 66; newly added text** *Chapter II TYPE DESIGN APPROVAL CONSIDERATIONS SECTION 7: EVALUATION CRITERIA OF THE ETOPS TYPE DESIGN* *...* *"(15) Engine Condition Monitoring.* *Procedures for an engine condition monitoring process should be defined and validated for ETOPS. ..."* Boeing suggests that the following changes be made: "(15) Engine Condition Monitoring. Procedures for an engine condition monitoring process should be defined and validated for ETOPS **by the associated engine manufacturer. …"** JUSTIFICATION: Responsibility to develop these engine procedures and processes must not fall on the operator or the airplane type certificate holder who have neither the resources nor the expertise. Without the clarification, engine manufacturers may not accept the responsibility.	The text has not been amended. Chapter II does not apply to operators but to (S)TC holders seeking approval for the airframe/engine combination. The requirements cannot be imposed on other than the applicants, and in addition it has been considered to leave it open to somebody else than the engine manufacturer to develop a programme.
19	Boeing	**Page number: 184** **Re Comment number: Unknown; newly added**	The Agency thanks the commenter for the reaction. The text has been amended as proposed.

CRD comment no.	Commenter	Reaction	EASA response
		text *APPENDIX 1 - PROPULSION SYSTEM RELIABILITY ASSESSMENT* *2. RELIABILITY VALIDATION METHODS* *...* *"(i) The extent to which previous service experience of common propulsion system used on an ETOPS approved aeroplane. systems can be considered; ..."* Boeing suggests that the following changes be made: "(i) The extent to which previous service experience ~~of~~ **with a** common propulsion system used on an ETOPS approved aeroplane. systems can be considered; ..." JUSTIFICATION: Clarify the intent of the recently added text.	
20	Boeing	**Page number: 203** **Re Comment number: 78, 222, etc.; newly added text** *APPENDIX 3 - OPERATIONAL LIMITATIONS* *"1. AREA OF OPERATION* *An operator is, when specifically approved, authorised to conduct ETOPS flights within an area where the diversion time, at any point along the proposed route of flight, to an adequate ETOPS en-route alternate aerodrome, is less than the operator's approved diversion time (under standard conditions in still air) at*	The text has been amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		the approved one-engine-inoperative cruise speed." Boeing suggests that the following changes be made: "An operator is, when specifically approved, authorised to conduct ETOPS flights within an area where the diversion time, at any point along the proposed route of flight, to an adequate ETOPS en-route alternate aerodrome, is ~~less than~~ **within** the operator's approved diversion time …" JUSTIFICATION: EASA has made no previous indication that operation may not be up to the fully allowed diversion time.	
21	Boeing	**Page number: 207** **Re Comment number: 124; newly added text** *APPENDIX 4 - FLIGHT PREPARATION AND IN-FLIGHT PROCEDURES,* *3. COMMUNICATION AND NAVIGATION FACILITIES* *"For releasing an aeroplane on an ETOPS flight, the operators should ensure that:* *...* *b. Visual and non-visual aids are available at the specified alternates for the anticipated types of approaches and operating minima."* Boeing suggests that the following changes be made: "b. Visual and non-visual aids are available at the	The Agency proposal does not limit the use of non-terrestrial systems. This aspect may be part of further analysis in a future task which would envisage aligning AMC 20-6 with future Part-OPS and Part-SPA.

CRD comment no.	Commenter	Reaction	EASA response
		specified alternates for the anticipated types of approaches and operating minima. **Note: Non-terrestrial approaches, e.g. RNAV (GNSS) and RNAV (RNP), may be utilized if approved in a certificate holder's operating specifications."** JUSTIFICATION: For harmonization/consistency with FAA.	
22	Boeing	Page no. 209 APPENDIX 4 - FLIGHT PREPARATION AND IN-FLIGHT PROCEDURES 5. ALTERNATE AERODROMES "To conduct an ETOPS flight, the ETOPS en-route alternate aerodromes, should meet the weather requirements of planning minima for an ETOPS en-route alternate aerodromes contained in the applicable operational requirements. ETOPS planning minima apply until dispatch. The planned en-route alternates for using in the event of propulsion system failure or aeroplane system failure(s) which require a diversion should be identified and listed in the cockpit documentation (e.g. computerised flight plan) for all cases where the planned route to be flown contains a point more than the operator's approved diversion time at the one-engine-inoperative speed, under standard conditions in still air, from an adequate aerodrome." Boeing suggests that the following changes be made to the highlighted text:	The text has been amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		"The planned en-route alternates for using in the event of propulsion system failure or aeroplane system failure(s) which require a diversion should be identified and listed in the cockpit documentation (e.g. computerised flight plan) for all cases where the planned route to be flown contains a point **that is an extended** ~~more than the operator's approved~~ diversion time at the one-engine-inoperative speed, under standard conditions in still air, from an adequate aerodrome." OR "The planned en-route alternates for using in the event of propulsion system failure or aeroplane system failure(s) which require a diversion should be identified and listed in the cockpit documentation (e.g. computerised flight plan) for all cases where the planned route to be flown contains ~~a~~ **an ETOPS** point ~~more than the operator's approved diversion time at the one-engine-inoperative speed, under standard conditions in still air, from an adequate aerodrome."~~ JUSTIFICATION: By definition, there can be no points on the route "more than the operator's approved diversion time" from an aerodrome. So if current words are kept, technically, no alternate airports need ever be identified. This paragraph was intended to require identification of planned enroute alternates that are extended diversion times from the flight. The FAA	

CRD comment no.	Commenter	Reaction	EASA response
		refers to this time as the ETOPS threshold time, but EASA has no such term, and it has two different values. See: Chapter III OPERATIONAL APPROVAL CONSIDERATIONS SECTION 1: APPLICABILITY This acceptable means of compliance is for operators seeking an ETOPS operational approval to operate: (1) Two-engined aeroplanes with a maximum passenger seating configuration of 20 or more, or with a maximum take-off mass of 45 360 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 take-off mass of less than 45 360 kg, in excess of 180 minutes at the approved one-engine-inoperative speed (in still air) from an adequate aerodrome.	
23	Boeing	**Page number: 213** **Re Comment number: Unknown; newly added text** *APPENDIX 5 - ETOPS EN-ROUTE ALTERNATE AERODROMES* *2. DISPATCH MINIMA – EN-ROUTE ALTERNATE AERODROMES.*	The proposed amendment is not compatible with OPS 1.297. AMC 20-6 describes a means to obtain the operational approval required by OPS 1.246, therefore the AMC 20-6 cannot contain different minima than OPS 1.297. In addition APV approaches cannot be considered precision approaches and other minima for APV approaches should be established. This aspect may be

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<tr><td>Precision Approach</td><td>Authorised DH/DA plus an increment of 200 ft</td><td>Authorised visibility plus an increment of 800 metres</td></tr>
<tr><td>Non-Precision Approach or Circling approach</td><td>Authorised MDH/MDA plus an increment of 400 ft</td><td>Authorised visibility plus an increment of 1500 metres</td></tr>
</table>
The above criteria for precision approaches are only to be applied to Category 1 approaches. When determining the usability of an Instrument Approach (IAP), forecast wind plus any gusts should be within operating limits, and within the operators maximum crosswind limitations taking into account the runway condition (dry, wet or contaminated) plus any reduced visibility limits. Conditional forecast elements need not be considered, except that a PROB 40 or TEMPO condition below the lowest applicable operating minima should be taken into account."
Boeing suggests that the following changes be made at the highlighted areas:
<table>
<tr><td>"Approach Facility</td><td>Ceiling</td><td>Visibility</td></tr>
<tr><td>Precision Approach <u>or</u></td><td>Authorised DH/DA plus an</td><td>Authorised visibility plus an</td></tr>
</table>
</td><td>part of further analysis in a future task which would envisage aligning AMC 20-6 with future Part-OPS and Part-SPA.</td></tr>
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<tr><td></td><td></td><td>
<table>
<tr><td><u>Approach procedure with vertical guidance (APV)</u></td><td>increment of 200 ft</td><td>increment of 800 metres</td></tr>
<tr><td>Non-Precision Approach or Circling approach</td><td>Authorised MDH/MDA plus an increment of 400 ft</td><td>Authorised visibility plus an increment of 1500 metres</td></tr>
</table>

The above criteria for precision approaches are only to be applied to Category 1 approaches. <u>Approach procedures with vertical guidance (APV) include RNAV(GNSS or GPS) and RNAV(RNP) approaches</u>. When determining the usability of an Instrument Approach (IAP), forecast wind plus any gusts should be within operating limits, and within the operators maximum crosswind limitations taking into account the runway condition (dry, wet or contaminated) plus any reduced visibility limits. Conditional forecast elements need not be considered, except that a PROB 40 or TEMPO condition below the lowest applicable operating minima should be taken into account."

JUSTIFICATION: Recognition should be made of these more advanced and capable systems.</td><td></td></tr>
<tr><td>24</td><td>Airbus</td><td>Proposed amendments to AMC to Part-M and Part-145 have been consolidated as Appendix 8 to AMC 20-6. The resulting text should include the following suggestions for improvements:</td><td></td></tr>
</table>

CRD comment no.	Commenter	Reaction	EASA response
		New Appendix 8 - § 2.e: In the note, it is suggested to replace the term "blinking messages" by the more explicit term "intermittent indication of failures". **New Appendix 8 - § 4.c:** It is suggested to update text of § 4.c(2) as follows (new text is underlined): Quote Engine/APU Oil analysis/Oil clog assessment Unquote **New Appendix 8 - § 5.b:** It is suggested to add reference to Part M in the text as follows (new text is underlined): Quote b. Have satisfactorily performed ETOPS tasks under supervision, within the framework of the Part M and Part-145 approved procedures for Personnel Authorisation. Unquote	First comment: The text has been amended as proposed. Second comment: The text is not amended. The operator would be able to identify through oil analysis contamination which would create clogging. Appendix 8 section 5 applies to personnel involved in the continuing airworthiness management of the aircraft and to maintenance personnel. Therefore CAMOs are affected by this paragraph. However, the particular requirements to have

CRD comment no.	Commenter	Reaction	EASA response
		Continuing Airworthiness and Maintenance Organizations (CAMO) are regulated by Part M. Aircraft maintenance organizations and maintenance actions are regulated under Part 145, including maintenance personnel training and authorization. However aircraft servicing is not addressed by Part 145 but by Part M. Therefore the personnel in charge of performing ETOPS maintenance tasks and servicing have to be trained and authorized for that purpose as per both Part 145 and Part M personnel requirements (Ref Part 145.A.30 and Part M.A.706 and related AMCs and GMs, in particular AMC 145.A.30(e), M.A.706 (g), (h) and AMC M.A.706). It is not necessary for an airline operator (AOC) to be Part 145 approved especially when operators totally outsource/subcontract their maintenance, but it is mandatory to be Part M approved. In addition, for ETOPS operators, it is mandatory to produce an ETOPS maintenance manual and to have it approved by the operator's surveying authorities. This is under the responsibility of the Part M organization or CAMO that this ETOPS maintenance manual has to be produced. It can be feared that totally removing reference to Part M into Appendix 8 may cause operator's CAMO and MRO personnel to lack of ETOPS knowledge/training/ authorization because of the absence of a clear regulatory requirement.	performed ETOPS tasks under supervision are only applicable to maintenance personnel of the Part-145.
25	Alitalia-CAI	**Subject: Alitalia comments/reaction to CRD to**	The text has been amended as follows:

CRD comment no.	Commenter	Reaction	EASA response
		NPA n°2008-01 **General** We appreciate the whole effort in make proposed ETOPS requirement more clear and modern. However we would like to take this opportunity to submit our reaction to one particular issue: Reliabity Progarmme. We hope our proposal may contribute to subject NPA process. **1. Reliability Programme** **Preamble: current rules and scenario:** Both current ETOPS rule and proposed NPA requires operators to have an ETOPS Reliability Program. This is one of the unique requirements of the ETOPS rule. Current **EASA** requirements is: AMC20-6 Appendix 4. 7 "Reliability Programme" (as well as ref. to NPA, page 19/165 Appendix I to AMC M.A. 302 and AMC M.B. 301 (b), 6.5.6.4)): - "The etops reliability program … should be <u>event</u> orientated and incorporate reporting procedures for **<u>significant events</u>** detrimental to ETOPS flights. …" Current **FAA** AC142-B, Chapter 3; 301.i. "Reliability	Appendix 8, section 2 e. failures of malfunctions of ETOPS significant systems **having a detrimental effect on ETOPS flight.**

CRD comment no.	Commenter	Reaction	EASA response
		Program" requirements is very similar: - "The (etops reliability) program must be event-oriented, and incorporate reporting procedures for **significant events** detrimental to ETOPS flights. … As we know, main Aircraft Manufacturer support operators to interpret and implement ETOPS rules by providing guides. Such guides interpret current "Event oriented reliability program" as follow: **Airbus** provides with a Significant System List (i.e. A330) which split the ETOPS significant Systems in 3 categories, one of which is the system that have to be reported ONLY when given circumstances are met, in particular those "circumstances" are only related to significant, heavy and in-flight events. **Boeing** is even more clear: with ref to Boeing guide, vol II, "Maintenance Program Guidelines", 5.3.8 ETOPS reliability program: "An ETOPS event is defined as a system malfunction, degradation or other **in-flight** event that requires the crew to make a decision whether to return to the departure station, divert or continue under an increased level of alertness.." Based on above current rules and current support from manufacturers, is very common that operators are currently reporting ONLY significant event such: In-Flight Event leading or near to lead to a flight	

CRD comment no.	Commenter	Reaction	EASA response
		interruption. This interpretation as far as today is common for EASA and FAA operators. **Comment:** CRD to NPA 2008-01 final proposed text, ref Appendix 8 3.2 Reliability Programme plus ref. to Appendix 8.2. Occurrence reporting, completely deleted references to the wording "The etops reliability program … should be event orientated and incorporate reporting procedures for significant events detrimental to ETOPS flights." So, by strictly applying proposed final text, ALL failures and malfunction of any ETOPS system will have to be reported regardless the importance of the event, which phase of flight and where it occurs. If confirmed, this requirement will be a mile stone. - It means that in example any APU malfunction, any PRV malfunction, even on ground, will have to be reported to the Authority within 72 hours. - It also means that all the interpretations/guides from manufacturers have to be erased. - More important it means there will be completely different requirement and behaviour between FAA operators and more restrictive requirements for EASA operators. - Also it is important to consider that the NPA was	

CRD comment no.	Commenter	Reaction	EASA response
		proposed maintaining current wording. Its deletion has added only in the CRD text. So operators didn't have any other occasion to react to this. **Proposal AZA1**: Our proposal is to maintain current wording ("The etops reliability program …should be event orientated and incorporate reporting procedures for **significant events** detrimental to ETOPS flights."). **Proposal AZA2:** In order to support such requirement (AZA1), we kindly ask EASA to perform a survey and review of ETOPS reporting from all EASA operators to confirm current interpretation of etops significant event and, more important, to demonstrate current positive results in ETOPS operation reliability trend. **Proposal AZA3:** Meeting with the operators and local Authority before final approval and release of new rules. This will permit to share and discuss all different interpretation of proposed rules in particular above AZA proposal.	
26	MOT Austria	Comment: Some Parts of the AMC refer to actions to be followed by the Competent Authority (CA). (NAA or Agency) Due to the fact that the rules are currently changing to a so called "total system approach", were generic and	Comments received during the consultation phase of the NPA showed that stakeholders preferred to keep AMC 20-6 as a comprehensive document containing all material applicable both to applicants (TC holders, operators) and competent authorities. That is the reason why AMC 20-6 has not been aligned with the

CRD comment no.	Commenter	Reaction	EASA response
		detailed Authority Requirements are being introduced, we strongly recommend transferring all applicable "requirements" for CA of this AMC to this AR.	new rule structure yet. This aspect may be part of further analysis in a future task which would envisage aligning AMC 20-6 with future Part-OPS and Part-SPA. As for total system approach, AMC 20-6 is in line with the objectives of the concept of total system approach as it deals with ETOPS from the different possible perspectives.
27	MOT Austria	Comment: The terms "shall" and "must" are used in this AMC. This is not consistent with the legal status of an AMC. These terms have to be either changed to reflect the status as AMC or the "requirements" have to be transferred into a rule. In addition to that the terms "requires/requirement" are used. In the case this AMC contains requirements which have to be followed they have to be transferred into a rule	Chapter 1, section 1 has been amended to include the following text: **An applicant may elect to use another means of compliance which should be acceptable to the Agency or the competent authority. Compliance with this AMC is not mandatory. Use of the terms *shall* and *must* apply only to an applicant who elects to comply with this AMC in order to obtain airworthiness approval or to demonstrate compliance with the operational criteria.**
28	Nicolas Air France	**Chapter I SECTION 4 TERMINOLOGY.** a. (2) (III) A speed other than the approved one-engine-inoperative-speed may be used as the basis for compliance with en-route obstacle requirements. A speed other than the approved one-engine-inoperative-speed may be used as the basis for compliance with en-route obstacle requirements. The fuel required with that speed or the critical fuel scenario associated with the applicable ETOPS equal-	Comment 1: The text has been amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		time point, whichever is higher has to be uplifted. **The Maximum Diversion Time associated with time limited systems should not be exceeded.** **PROPOSAL** The maximum diversion time is better explained further in detailed cases (<180 , >180). This sentence can be removed from this definition. **Chapter I SECTION 4 TERMINOLOGY.** (3) As permitted in Appendix 4 of this AMC, based on evaluation of the actual situation, the pilot in command has the authority may ~~to~~ deviate from the planned one-engine-inoperative cruise speed. **PROPOSAL** ~~To~~ : typo **Chapter I SECTION 4 TERMINOLOGY** d. ETOPS significant system (2) ETOPS Group 2 Systems (ii) Time-limited systems including cargo fire suppression ~~and oxygen if the ETOPS diversion is oxygen system duration dependent.~~ **PROPOSAL** Oxygen system should be excluded as all supplemental oxygen regulatory framework is already dealt by OPS 1.770.	Comment 2: Typo corrected as proposed by the commenter. Comment 3: the paragraph has not been amended. The text is intended to remark that oxygen systems should be taken into consideration in the determination of the time-limited systems.

CRD comment no.	Commenter	Reaction	EASA response
		Chapter I SECTION 4 TERMINOLOGY e. Extended Range Entry Point The extended range entry point is the first point on the aeroplane's ~~outbound~~ route which is : … **PROPOSAL** Why: "outbound" ? This item should be considered at any time along the route. **Chapter I SECTION 4 TERMINOLOGY** g. Maximum Approved Diversion Time […] The maximum approved diversion time(s) ~~for the aeroplane should not be exceeded and~~ are reflected in the AFM or AFM-supplement. **PROPOSAL** Remove as it can be exceeded in different cases (eg : 115% of MDT) and is detailed further. **Chapter I SECTION 4 TERMINOLOGY** h. Operator's Approved Diversion Time Operator's Approved Diversion Time is the maximum time authorised by the Competent Authority that the operator can operate a type of aeroplane at the approved oneengine-inoperative cruise speed (under standard conditions in still air) from an adequate aerodrome for the area of operation	Comment 4: The text has been amended as proposed by the commenter. Comment 5: The text has been amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		PROPOSAL "under standard conditions" to be added to comply with current definition **APPENDIX 4 – FLIGHT PREPARATION AND IN-FLIGHT PROCEDURES** **7. DELAYED DISPATCH** If the dispatch of a flight is delayed by more than one hour, ~~after the operating crew have left the briefing facility~~, pilots and/or operations personnel should monitor weather forecasts and airport status at the nominated en-route alternates to ensure that they stay within the specified planning minima requirements until dispatch. **COMMENT:** Some airlines operate without briefing facilities or operations personnel. **APPENDIX 7 – TYPICAL ETOPS OPERATIONS MANUAL SUPPLEMENT** **PART A.GENERAL/BASIC** a. Specific type-related ETOPS operations (1) ETOPS specific limitations (2) Types of ETOPS operations that are approved (3) Placards and limitations (4) OEI speed(s)	Comment 6: The text has been amended as proposed by the commenter. Comment 7: The text has been amended as proposed by the commenter.

CRD comment no.	Commenter	Reaction	EASA response
		(5) Identification of ETOPS aeroplanes (6) ETOPS fuel planning (7) Critical Fuel Scenario PART B. AEROPLANE OPERATING MATTERS ~~c. ETOPS Fuel Planning~~ ~~d. Critical Fuel Scenario~~ ~~e.~~ c. MEL/CDL considerations ~~f.~~ d. ETOPS specific Minimum Equipment List items ~~g.~~ e. Aeroplane Systems **COMMENT:** Transferred from Part B, c, d.	Comment 8: The text has not been amended. Fuel planning and critical fuel scenario usually belong to operations manual Part-B. This does not preclude other operations manual structures of being acceptable to the competent authority of the operator.
29	Walter Gesky	1. Some Parts of the AMC refer to actions to be followed by the Competent Authority (CA). (NAA or Agency) Due to the fact that the rules are currently changing to a so called "total system approach", were generic and detailed Authority Requirements are being introduced, we strongly recommend transferring all applicable "requirements" for CA of this AMC to this AR. 2. The terms "shall" and "must" are used in this AMC. This is not consistent with the legal status of an AMC. These terms have to be either changed to reflect the status as AMC or the "requirements" have to be transferred into a rule. 3. In addition to that the terms "requires/requirement"	Chapter 1, section 1 has been amended to include the following text: **An applicant may elect to use another means of compliance which should be acceptable to the Agency or the competent authority. Compliance with this AMC is not mandatory. Use of the terms *shall* and *must* apply only to an applicant who elects to comply with this AMC in order to obtain airworthiness approval or to demonstrate compliance with the operational criteria.**

CRD comment no.	Commenter	Reaction	EASA response
		are used. In the case this AMC contains requirements which have to be followed they have to be transferred into a rule. Additional detailed comments will be provded by Austro Control	
30	European Cockpit Association	Chapter III OPERATIONAL APPROVAL CONSIDERATIONS SECTION 5: ACCELERATED ETOPS APPROVAL 5.1 Application phase (A) Accelerated ETOPS Operations approval plan ECA would like to repeat its comment given that EASA did not reply to our original comment 166 and failed to give proper justification on comments 167 and 168. ECA requests that only one single engine diversion speed shall be used and clearly stated in the Aircraft Flight Manual to avoid confusion between Flight Crews and Dispatchers. Amend text Chapter III, Section 5.1 (A) to read: 2. The proposed one-engine-inoperative cruise speed~~, which may be area specific depending upon anticipated aeroplane loading and likely fuel penalties associated with the planned procedures~~; Justification: diversions have already been performed with speeds used by the Flight Crew which were different from the assumptions made by the Dispatch. Confusion is to be avoided in all cases but especially in challenging situations where one engine is inoperative.	AMC 20-6 provides for using different diversion speeds in particular for obstacle clearance. Operators are responsible for delivering appropriate training on this particular issue.

CRD comment no.	Commenter	Reaction	EASA response
		Any discrepancy between two major safety players (flight crew and dispatch) should be avoided.	
31	European Cockpit Association	APPENDIX 3 - OPERATIONAL LIMITATIONS 3. ISSUE OF THE ETOPS OPERATIONS APPROVAL BY THE COMPETENT AUTHORITY ECA would like to repeat its comment given that EASA did not reply to our original comment 166 and failed to give proper justification on comments 167 and 168. ECA requests that only one one single engine diversion speed shall be used and clearly stated in the Aircraft Flight Manual to avoid confusion between Flight Crews and Dispatchers. Amend text Appendix 3, Section 3 to read: i. The one-engine-inoperative cruise speed~~, which may be area specific, depending upon anticipated aeroplane loading and likely fuel penalties associated with the planned procedures~~; Justification: diversions have already been performed with speeds used by the Flight Crew which were different from the assumptions made by the Dispatch. Confusion is to be avoided in all cases but especially in challenging situations where one engine is inoperative. Any discrepancy between two major safety players (flight crew and dispatch) should be avoided.	AMC 20-6 provides for using different diversion speeds in particular for obstacle clearance. Operators are responsible for delivering appropriate training on this particular issue.

CRD comment no.	Commenter	Reaction	EASA response
32	European Cockpit Association	Chapter III OPERATIONAL APPROVAL CONSIDERATIONS SECTION 7: ETOPS APPROVAL CATEGORIES 7.2.2 APPROVAL FOR DIVERSION TIME ABOVE 90 MINUTES UP TO 180 MINUTES ECA comment to NPA: *ECA wonders why is "satellite based comm." not mentioned here (up to 180 minute diversion time)?* *It is forecast page 74 in paragraph 3 (ii) for ETOPS above 180 mn.* *ECA considers that VHF/HF and data link only is not satisfactory from a safety point of view in case of real diversion.* The EASA response to our comment is not acceptable for 2 reasons: 1. Stating that the current AMC does not request it is no reason why safety should not be approved when amending legislative text. 2. EASA response: "the Agency did not have any reason for changing this". ECA is surprised by this remark. The AF447 accident has clearly shown there is a communication problem in remote areas. The areas where HF is not reliable and/or no datalink system is correctly implemented are far too numerous (Africa, South Atlantic, Indian Ocean, …). ECA therefore requests the Agency to review this comment again and amend the text as proposed by ECA.	Paragraph 7.1 (vi) mentions VHF/HF and data link as examples, the requirement mentions "communication equipment" and does not specifically limit it to VHF/ HF or data link. Satellite communications would also be possible. In order to clarify this, the text has been amended to mention satellite based communications.

CRD comment no.	Commenter	Reaction	EASA response
		Insert new item (i) to read and renumber the following items: **(i) Communications Equipment (VHF/HF, Data Link and Satellite based communications)** **Operators are required to use any or all of these forms of communications to ensure communications capability when operating ETOPS in excess of 90 minutes. For all routes where voice communication facilities are available, voice communications should be provided in the aeroplane.** ~~(i)~~ **(ii)** Additional Considerations for aircraft with 120 minutes Maximum Approved Diversion Time	
33	European cockpit Association	Appendix 4 - Flight Preparation and In-Flight Procedures - 10 ETOPS Parts Control - 2. Minimum Equipment List (MEL) Amend to read: q. Fuel Quantity Indicating System (FQIS) **including a fuel used / fuel on board discrepancy alarm;** Justification: ECA would like to point out that the Fuel Quantity Indicating System (FQIS) specified in item (a) does not include a "fuel used / fuel on board discrepancy" alarm. Such an alarm could alert the crew when safe diversion could be at risk. This is a key safety feature and is one of the	The definition of adequate fuel quantity information affects not only ETOPS aircraft and operations. Therefore, rulemaking task 25.055 Fuel System Low Level Indication/Fuel Exhaustion has been set to provide additional guidance on the low level fuel alert. The outcome of this task may be taken into account in a future task which would envisage aligning AMC 20-6 with future Part-OPS and Part-SPA.

CRD comment no.	Commenter	Reaction	EASA response
		recommendations of the accident investigation report of the Air Transat 2001: **Final Investigation Report 22 / ACCID / 2001** ***4.2 Action Required*** ***4.2.1 Fuel Leak Detection and Warning*** Indications and warning systems should be designed to detect critical events, to provide unambiguous information on critical situations with high risk, and to direct crews to specific actions that would mitigate these risks. Clear indications and warnings are particularly necessary for high risk, rare events, situations that are difficult to diagnose, and situations that require precise handling, in particular under conditions of high workload and stress. Historically, fuel leaks were considered to be rare events, and although consequences could be significant, the overali risk was evaluated as being low. It was also considered that routine fuel quantity monitoring and common sense would drive a crew to a prompt precise determination of the cause of the symptoms and to take the required action. The historical occurrence records indicate that, although in-flight fuel leaks are infrequent events, these events continue to occur. Recent occurrences have revealed that crews have had difficulty in diagnosing fuel leak situations, and that the consequences can be significant. Analyses of past events have resulted in the design and implementation of systems capable of detecting fuel loss events and of alerting crews, and in the creation	

CRD comment no.	Commenter	Reaction	EASA response
		specific fuel leak checklist procedures. Some civil aviation authorities have mandated the implementation of these capabilities and checklist procedures. In this occurrence, the crew's routine monitoring did not detect that a fuel leak was occurring until over 6 tons of fuel had been lost. Also, the low-level nature of the Fuel ADV, on its own, did neither clearly indicate the cause of the imbalance nor the severity of the situation that existed. Although the Airbus A-330 Flight Warning Computer has a FUEL FU/FOB DISCREPANCY Caution alert capability, the implementation of this system capability has neither been mandated for all Airbus A-330 aircraft nor for other Airbus aircraft of similar fuel system design. *Therefore, it is recommended that Direction Générale de l'Aviation Civile of France:* • ***Mandate the implementation of the FUEL FU/FOB DISCREPANCY*** *Caution alert for all A-330 aircraft, and* • *Mandate the incorporation of a fuel loss alert for other Airbus aircraft with similar fuel system design.* It is also recommended that the civil aviation authorities of other transport aircraft categories manufacturing states, such as Canada, United States of America, and United Kingdom, as well as the European Aviation Safety Authority: • *Review the adequacy of aircraft indications and warning systems and procedures to detect fuel-*	

CRD comment no.	Commenter	Reaction	EASA response
		used/fuel-loss discrepancy situations; *• Review the capability of these systems to provide clear indications as to the causes of these situations, and* *• Review the capability of these systems to provide alerts at a level commensurate with the criticality of a fuel-loss situation.* *4.2.2* ***Fuel Leak Training*** Training is the fundamental approach to ensuring that crews remember/recall, and can easily assimilate symptoms with a required procedure. Training also ensures more accurate completion of the procedure designed to mitigate a given situation, in particular for a rare event, or for situations of high workload and stressful situations. As a result of previous similar occurrences, fuel leak checklists had been created or improved, and some limited documentation had been added to flight manuals regarding the criteria to be used to determine if a fuel leak exists. Notwithstanding, prior to this occurrence, no or very little training was provided to crews on fuel leak situations. This deficiency is not unique to this A330 operator or to other Airbus operators having similar fuel and flight management systems. For this particular occurrence, had the flight crew members been trained in the symptoms of fuel leak situations and strategies to identify and counter such a situation, they would have been better prepared to take appropriate actions.	

CRD comment no.	Commenter	Reaction	EASA response
		Although since this occurrence, some civil aviation authorities and aircraft manufacturers have taken action to improve related checklists and to improve crew awareness of the critical nature of fuel leaks, there are a number of commercial aircraft that do not have identification procedures or fuel leak checklists. There are also no specific regulatory requirements for training on fuel leak scenarios. The historical occurrence records indicate that, although in-flight fuel leaks are infrequent events, these events continue to occur. The dissemination of information related to this occurrence will enhance safety by increasing crew awareness of the fuel leaks in the short term. Notwithstanding, ensuring safety in the longer term will require other sustained action to ensure that crews are better prepared for these events. *Therefore, its is recommended that Direction Genérale de l'Aviation Civile of France, Transport Canada, Civil Aviation Authority of the United Kingdom, the Joint Aviation Authority, European Aviation Safety Authority, and the civil aviation authorities of other states.* *• Review flight crew operating manuals and checklist procedures to ensure that they contain adequate information related to fuel leak situations;* *• Review flight crew training programs to ensure that they adequately prepare crews to diagnose and take appropriate actions to mitigate the consequences of fuel leak events, and*	

CRD comment no.	Commenter	Reaction	EASA response
		• Amend regulations and standards to require crew training on fuel leak events. *It is also recommended that, as an interim safety measure, all civil aviation authorities.* *• Promulgate the circumstances of this fuel leak event to all air operators, aircraft manufacturers and flight crew training organizations.* ***4.2.3 Automated Fuel Transfers*** As evidenced in this occurrence, the automated transfer of fuel from the trim tank to the right wing tank and subsequently to the leak in the right engine resulted in over 3.2 tons of fuel being lost. Although the trim tank transfer memos were displayed to the crew, these memos did not reflect the seriousness of the abnormal transfer of a significant amount of fuel to only the set of wing tanks on one side of the aircraft. This transfer also contributed to masking the fuel leak problem from the crew. *Therefore, it is recommended that Direction Genérale de l'Aviation Civile of France, in consultation with Airbus:* *• Review the automated, fuel-transfer systems on Airbus aircraft to ensure that the systems are able to detect abnormal fuel transfers, that systems exist and procedures are in place to inhibit abnormal transfers, and that the crews are notified, at an appropriate warning level, of abnormal fuel transfers.*	

CRD comment no.	Commenter	Reaction	EASA response
		4.2.4 Significant Fuel 1m balances As evidenced in this and many other occurrences, significant fuel imbalances between wing tanks would most likely occur if there were a significant fuel leak. It is also apparent that, in such situations, directing crews using a FUEL ADV and the information on the Fuel page to a FUEL IMBALANCE checklist may not provide a definitive indication that a serious fuel leak could exist. Not immediately focusing crews to the probable existence of a fuel leak and to the indications that could be used to interpret the source of the leak has the potential to delay the critical actions required to mitigate the consequences of a fuel leak. *Therefore, it is recommended that Direction Genérale de l'Aviation Civile of France and EASA:* *• Review Airbus aircraft indication and warning systems and abnormal procedures to ensure that, in situations of major fuel imbalances, actioning of appropriate fuel leak procedures becomes a priority for flight crews; and* *• Consider merging the Airbus FUEL IMBALANCE and FUEL LEAK checklist procedures into one procedure, containing, at the top of the procedure, the conditions that would suggest the presence of a fuel leak. It is also recommended that the civil aviation authorities of other aircraft manufacturing states, such as Canada, United States of America, and United Kingdom, as well as the European Aviation Safety Authority.* *• Review the adequacy of the fuel indications and*	

CRD comment no.	Commenter	Reaction	EASA response
		warning systems, as well as procedures associated with fuel imbalance situations to ensure that the possibility of a fuel leak is adequately considered	
34	European Cockpit Association	Appendix 4 - Flight Preparation and In-Flight Procedures - 5. Alternate Aerodromes ECA commented that the phrase "applicable (ETOPS) threshold" shall be better clarified. This comment was accepted by the Agency and the text was amended. However, the amending done by the Agency resulted in deletion of the text. This is not acceptable because it is vital for Flight crew to know under which assumptions the flight has been prepared. Our comment was made to be sure that if an airline has an ETOPS 180 agreement and is preparing an ETOPS flight using only 120 min diversion time (to save fuel), it has to be clearly mentioned to the crew. Insert new text to read: **ETOPS en-route alternates should also be identified and listed in operational flight plan for all cases where the planned route to be flown contains a point beyond the 60 min ETOPS threshold time at the one-engine-inoperative speed from an adequate aerodrome.**	The text has been amended to meet the intent proposed by the commenter.
35	IACA international Air Carrier Association	Page 153 **CHAPTER I - GENERAL CONSIDERATIONS** Section 4: Terminology **Comment**: Please include missing ETOPS definition	The Agency thanks the commenter for the reaction. The ETOPS definition might be found in CS-DEF.

CRD comment no.	Commenter	Reaction	EASA response
36	IACA international Air Carrier Association	CRD p177 CHAPTER III - OPERATIONAL APPROVAL CONSIDERATIONS **Section 7: ETOPS approval categories** ☐ **Comment**: Approval for 75 min or less diversion time has to be included in this section. ☐ **Comment**: Revise accordingly to state there are 5 approval categories: Approval for 75 minutes or less diversion time. Approval for 90 minutes or less diversion time Approval for diversion time above 90 minutes up to 180 minutes Approval for diversion time above 180 minutes Approval for diversion times above 180 minutes of operators of two-engined aeroplanes with a maximum passenger seating configuration of 19 or less and a maximum take-off mass less than 45360 kg	Approval for diversion times between 60 min and 90 min falls under the group of "approval for 90 min or less diversion time".
37	MOT Austria	Chapter 2 Section 4 (2) Method 2 - Typo "analyses" should read "analysis"	The Agency thanks the commenter for the reaction. Typo corrected.
38	MOT Austria	Chapter 2 Section 5, last sentence - "The Agency will then initiate an assessment of the engine and airframe/engine combination in accordance with the criteria laid down in this chapter II and Appendix 1 & 2 of this AMC": Comment/Justification/Proposal	This paragraph is part of the means of compliance and therefore it refers to the conditions established to meet this means. This does not preclude other means of compliance to be proposed by the applicant.

CRD comment no.	Commenter	Reaction	EASA response
		Should read "...assessment in accordance with the means of compliance agreed between the applicant and the Agency", as this is only AMC, and not the only means of compliance.	
39	MOT Austria	Comment/Justification/Proposal: Chapter 2 Section 7 (15) Historically ECM has been purely in the hand of the engine TC holder. Given the reliance on integrated A/C systems, the interaction of aircraft systems on ECM should be analysed (eg, a HYDIM failure corrupts the ECM data, as the ECU can no longer calculate bleed flow without the input of ADP status from the A/C.)	Appendix 4 section 2: MEL, requires the operator to consider systems that may have an impact on the ECM.
40	MOT Austria	Comment/Justification/Proposal: Chapter 2 Section 8.2 (c) alludes to implementing maintenance task separation (split maintenance) in the MPD, but does not spell this out. See also Comment to Appendix 8	Appendix 8 section 4 requires the CAMO to specify procedures to ensure the continuing airworthiness of the aircraft particularly related to ETOPs operations. Paragraph (e) refers to **"procedures to preclude identical errors being applied to multiple similar elements in any ETOPS significant system".**
41	MOT Austria	Comment/Justification/Proposal: Chapter 3 Section 5.1 (A) (6) – Review gate is a very specific methodology. This has to be clearly defined. The process has to be detailed to ensuring standardised application.	The wording "review gate" refers to milestones of the tracking plan required in the case of accelerated ETOPS approval, the text of chapter 3 Section 5.1 (A) (6) has been improved.
42	MOT Austria	Comment/Justification/Proposal Chapter 3 Section 5.1 (B) 2. a – What is intended with the term "fully developed maintenance program"? This concept is not defined in connection with M.A.302?	Comment 1: The text "Fully developed" has been deleted.

CRD comment no.	Commenter	Reaction	EASA response
		Chapter 3 Section 5.1 (B) 2. b – "A tracking…" what is meant by this? A tracking reliability programme is not defined in M.A.302 or it's AMC + Appendix Chapter 3 Section 5.1 (B) 2. g – Typo's – delete the capitals.	Comment 2: The word "tracking" has been deleted. Comment 3: Capitals changed to lower case.
43	MOT Austria	Comment/Justification/Proposal Chapter 3 the accelerated ETOPS approval defined in Section 5 is very proscriptive, and provides the clear basis for an operator to got through a checklist and meet a goal. The Section 6 – In service experience approval gives little clear guidance, although these will be the applicants who have the most questions. Numerous elements of section 5 would be applicable to section 6 (eg, items A.1, 2, 3, 4, 5, B.1, 2, 3, 4, 5, 6, 7, 8, 9, C.3, 5, 6, 7) The information in Section 5 is much more clearly structured than section 6. We recommend to changing section 6 accordingly.	Section 5 describes a process that must be in place to show the competent authority that the operation meets the same safety objective without the required in-service experience. Section 6 is based on real data whereas section 5 describes a projection of data in the future.
44	MOT Austria	Comment/Justification/Proposal 1): Appendix 8 (3) This section makes no mention of the single most essential consideration of an ETOP AMP - separation of maintenance (split maintenance). Suggested text: *The AMP should be designed to prevent scheduled*	Appendix 8 section 4 requires the CAMO to specify procedures to ensure the continuing airworthiness of the aircraft particularly related to ETOPS operations. Paragraph (e) refers to **"procedures to preclude identical errors being applied to multiple similar elements in any ETOPS significant system".**

CRD comment no.	Commenter	Reaction	EASA response
		maintenance tasks being performed simultaneously on multiple systems, where the result of maintenance error could be a common cause failure of an essential or flight critical function. *(For example, LH Oil filter replacement and RH oil filter replacement should be implemented on separate task cards, and assigned to separate check packages.)* *The CAME/AMP should include maintenance procedures to ensure all affected staff are aware that simultaneous performance of unscheduled maintenance should be avoided on such systems where possible.* *Furthermore procedures should be established to insure that the organisation can identify when such maintenance (or a mix of scheduled and unscheduled maintenance) has been performed on such ETOPS significant systems.* *(For example, if during a maintenance check, the scheduled task - LH oil filter replacement is performed, while simultaneously the RH oil pump is replaced for unscheduled reason, the CAME should be informed)* *In this case, compensating procedures should be triggered to ensure that risk of maintenance induced error is controlled.* *(For example – double inspection through independent certifying staff, ground tests, verification flight etc)*	

CRD comment no.	Commenter	Reaction	EASA response
		Comment/Justification/Proposal 2): Appendix 8 (3) For operations above 180, consideration should be made of state of the art monitoring systems such as "real time trending" of ECM data, and debris monitoring systems, which have proven capable of providing warning within the short periods available for certain forms of acute problems, such as impending bearing failure. Comment/Justification/Proposal 3): Appendix 8. (3.2.6) Should also be linked with dual maintenance having been performed. See comment 1 above.	
45	Rolls-Royce plc [DGJ]	Editorial at top of page 153: "Supplemental Type Certificate" ...should be... "(Supplemental) Type Certificate"	The Agency thanks the commenter for the reaction. Typo corrected.
46	Rolls-Royce plc [DGJ]	Typographical error at the top of page 190: "he Agency" ...should be... "the Agency"	The Agency thanks the commenter for the reaction. Typo corrected.
47	Rolls-Royce plc [DGJ]	In Appendix 1 paragraph 1 on page 183, and also in paragraph 2 b.(1) on page 185, reference is made back to CS-E 1040. However, CS-E 1040 (as defined on page 25) itself makes reference to this AMC, thereby creating a circular reference.	The Agency thanks the commenter for the reaction. The reference to CS-E 1040 has been deleted.

CRD comment no.	Commenter	Reaction	EASA response
		Would it be more helpful and accurate to state that compliance with CS-E 1040 may be demonstrated by adopting the (relevant) provisions of AMC 20-6? Hence, the paragraph might read as follows... ...where type design approval for Early ETOPS is sought at entry into service, the engineering assessment can be based on substantiation by analysis, test, in service experience, ~~CS-E 1040 compliance~~ or other means, to show that the propulsion system will minimise failures and malfunctions and will achieve an IFSD rate that is compatible with the specified safety target associated with total loss of thrust. Adoption of the provisions of this Appendix 1 to AMC 20-6 is considered an acceptable means of compliance with CS-E 1040..."	
48	Rolls-Royce plc [DGJ]	Appendix 1 to AMC 20-6, entitled "Propulsion System Reliability Assessment" appears to relate to those issues which might reasonably be addressed by the Engine TC holder. However, there are a number of places where this becomes slightly unclear due to the way the text is presented - for example, page 189 makes reference to APU failure rates which would clearly fall outside the Engine TC holder's competence. Whilst recognising the difficulties in drafting AMC for such a highly integrated topic, for this to be a robust and unambiguous working document for the end-user, it would help if it were clearly segregated into sections "for the Engine TC holder", "for the Aircraft TC holder"	Appendix 1 was only amended to include the early ETOPS process. Paragraph 5 is clearly for the engine manufacturer. This separation between engine TC holder and airplane TC holder requirements could be done at a later stage based on experience with the application of this appendix.

CRD comment no.	Commenter	Reaction	EASA response
		etc and written in language appropriate to the target entity. This would ensure each of the players have a clear view of their responsibilities and give less opportunity for relevant issues to "drop between the cracks". As it stands, I fear that there may be a number of aspects of the AMC against which it would be difficult to write an unambiguous statement of compliance.	