



European Aviation Safety Agency  
**Comment-Response Document 2017-01**

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Appendix  
to Opinion No 09/2017

RELATED NPA: 2017-01 — RMT.0513 & RMT.0514 — 6.11.2017

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## 1. Summary of the outcome of the consultation

The comments from state organisations (10) and from industry (33) on NPA 2017-01 were generally positive, with some suggestions for clarification of the text within the NPA.

4 comments were received from non-governmental organisations which questioned the process and final decisions.



## 2. Individual comments and responses

In responding to comments, a standard terminology has been applied to attest EASA's position. This terminology is as follows:

- (a) **Accepted** — EASA agrees with the comment and any proposed amendment is wholly transferred to the revised text.
- (b) **Partially accepted** — EASA either agrees partially with the comment, or agrees with it but the proposed amendment is only partially transferred to the revised text.
- (c) **Noted** — EASA acknowledges the comment but no change to the existing text is considered necessary.
- (d) **Not accepted** — The comment or proposed amendment is not shared by EASA.

### (General comments)

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comment	1	comment by: <i>Norwegian Ministry of Transport and Communications</i>
	The Norwegian Ministry of Transport and Communications has no comments to NPA 2017-01.	
response	Noted.	
comment	5	comment by: <i>Luftfahrt-Bundesamt</i>
	The LBA welcomes and supports the implementation of the CAEP/10 amendments on climate change, emissions and noise.	
response	Noted.	
comment	6	comment by: <i>EUROCONTROL</i>
	The EUROCONTROL Agency does not have comments on NPA 2017-01.	
response	Noted.	
comment	21	comment by: <i>DGAC France</i>
	Please note that DGAC has no specific comment on this NPA.	
response	Noted.	
comment	25	comment by: <i>Airbus Helicopters</i>
	The proposed amendments of Part-21 are referring to the current structure of Part-21.	
	However, this structure has been strongly reworked by the proposals of NPA 2015-03 (Level of Involvement) and associated Opinion 07/2016, where all requirements linked to Authorities are moved to section B. For example, changes proposed for § 21.A.18 should	



	<p>apply to new § 21.B.85.</p> <p>EASA should keep in mind that proposed changes will need to be adapted to the new structure and also in some cases to new texts resulting from NPA 2015-03. This also includes references to paragraphs of Part-21.</p>
response	<p>Not accepted.</p> <p>The proposed amendments have to be in relation to the current version of Regulation (EU) No 748/2012. If the proposed Level of Involvement amendments to this Regulation are agreed prior to the CAEP/10 amendments, then these will be taken into account during the final legislative approval process.</p>
comment	<p>35 comment by: <i>Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)</i></p> <p>The Swedish Transport Agency's general impression is that we agree and welcome the requirements and clarifications that are brought forth by the NPA 2017-01. However, we do have a couple of comments that we would like to raise.</p>
response	<p>Noted.</p>

## Executive summary

p. 1

comment	<p>23 comment by: <i>Rolls-Royce</i></p> <p>Rolls-Royce appreciates the opportunity to comment to this NPA Amendment 2017-01 (Implementation of the CAEP/10 amendments on climate change, emissions and noise).</p> <p>Rolls-Royce has reviewed the NPA and has no comments to submit.</p> <p>Thank you</p>
response	<p>Noted.</p>

## 2. In summary — why and what

p. 4-9

comment	<p>7 comment by: <i>Airbus</i></p> <p>Page 7, there are two items (d) in the description of the Annex 16 Vol II amendments. The second item (d) should be (e), and the word "standard" is missing in the title:</p> <p><del>(d)</del> (e) Introduction of an aircraft engine nvPM <b>standard</b> (Chapter 4 and Appendix 7)</p>
response	<p>Accepted. Text will be updated.</p>
comment	<p>39 comment by: <i>L. Riegle AIA</i></p> <p>Attachment <a href="#">#1</a></p>



The Aerospace Industries Association (AIA) appreciates the opportunity to provide comments on the European Aviation Safety Agency's (EASA's) proposed amendment for implementation of the CAEP/10 amendments on climate change, emissions and noise, published on January 17, 2017.

AIA is the premier trade association representing over 330 major aerospace and defense manufacturers and suppliers, and over one million aerospace and defense workers. Our members represent the United States of America's leading manufacturers and suppliers of civil, military, and business aircraft, helicopters, unmanned aerial systems, missiles, space systems, aircraft engines, material, and related components, equipment services, and information technology.

Our aerospace members are firmly committed to achieving the industry's progressive environmental goals by continuously improving engines, airframes, and aircraft systems with new and innovative technologies. The commercial aviation industry is proud of its strong environmental track record, including steady technology improvements in reducing aircraft greenhouse gas emissions (GHGs), local air quality emissions, and airport community noise over time. Today's commercial jet aircraft are 80 percent more fuel efficient than aircraft fifty years ago, with a 90 percent smaller noise footprint. Greater fuel efficiency translates into reductions in aircraft fuel consumption and GHGs. The commercial aviation industry has achieved greater fuel efficiency, and lower emissions, even as it has grown.

AIA recognizes and supports the global agreements made by ICAO and reflected by CAEP/10 amendments on climate change, emissions and noise, and the implementation of these agreements as reflected in the amendments of EASA NPA 2017-01. We appreciate EASA's prompt implementation of the recommendations, and adopting the ICAO Annex 16 changes.

response Noted.

**3. Proposed amendments and rationale in detail — 3.1. Draft regulation (Draft EASA opinion) —  
3.1.1. Draft Articles to be included in the draft amending Regulation amending Regulation (EC)  
No 216/2008 — Article1**

p. 10

comment 44

comment by: *Transport & Environment*

The current proposed amendments to the EASA Basic Regulation 216/2008 are in the form of a 'regulation'. However, the NPA does not clarify whether this is a commission regulation (i.e. a delegated act) or a full co-decision regulation. Incorporation of the CO<sub>2</sub> standard (volume III of the Chicago Convention) can only be done via full co-decision. Article 6 of the current Basic Regulation sets out what can and cannot be done via delegated act. The draft regulation proposes to amend Article 6 to expand the topics which can be amended by delegated act to include the CO<sub>2</sub> standard. As such, full co-decision MUST be used. If not, the Parliament can be expected to reject any Commission Regulation incorporating the CO<sub>2</sub> standard on the basis that the Commission is exceeding its powers.

In the past, Article 6 has been amended via a Commission Regulation (6/2013), however, that changed only the amendment numbers to the Volumes of the Chicago Convention that were already in Article 6 and left the volume at issue the same, therefore leaving the substance and scope of the regulation unchanged. The proposed amendment in the current NDA is to fundamentally alter the scope of the Basic Regulation to include an entirely new



matter: a CO<sub>2</sub> aircraft standard. As CO<sub>2</sub> from aircraft has never been regulated before at EU level, proposing to do so via delegated act would violate the spirit of the Treaties, even if not prohibited by Article 6 of the Basic Regulation itself (and it is so prohibited).

Article 6.2 of the Basic Regulation allows the use of delegated acts to amend the “non-essential elements of the requirements referred to in paragraph 1”. The key point here is the requirements referred to in paragraph 1 - these do not cover Volume III. For clarification, Article 6.2 allows delegated acts to be used to introduce measures under Volume I and II of the Chicago Convention but not the use of delegated acts to amend Article 6.1 itself.

Article 6.2 further refers to ‘subsequent amendments’ to the Chicago Convention and its Annexes, however, this also refers back to Article 6.1 which lists only Volume I and II and also that such amendments are only allowed “in so far as such adaptations do not broaden the scope of this Regulation”. A CO<sub>2</sub> aircraft standard entering EU law for the first time clearly broadens the scope of the regulation. However, if it was argued that an amendment to introduce the CO<sub>2</sub> standard does not broaden the scope of the regulation, this could not succeed as allowing something which does not broaden the scope of the regulation is also tied back to amendments relating to Volume I and II. It was because Regulation 6/2013 did not broaden the scope of the Basic Regulation and referred only to Volumes I and II of the Chicago Convention that the Commission was able to amend Article 6 via delegated act. This situation does not apply to the current draft regulations.

Article 6.3 refers to amendments to non-essential elements that are to supplement the parts of Volume I and II listed in Article 6.1. However, in the plain English meaning of ‘supplement’, the CO<sub>2</sub> standard is not developed to ‘supplement’ the existing NOx and noise standards, therefore, Article 6.3 cannot be used as a basis to introduce Volume III into EU law. Further, as specific provisions of Volume I and II are listed, it cannot be argued that Volume III simply supplements those volumes, for such an argument to succeed, Volume I and II would need to be listed in their entirety in Article 6.1.

The Commission has not been given power under the Basic Regulation to adopt the CO<sub>2</sub> aircraft standard via delegated act. The European Parliament would reject any such delegated act on the basis of the Commission exceeding its powers. The Commission can however introduce the CO<sub>2</sub> aircraft standard via full co-decision at any time.

response

Noted.

EASA appreciates the comments provided by Transport & Environment. It is noted that, while the aeroplane CO<sub>2</sub> standard is new, CO<sub>2</sub> emissions from aviation have previously been regulated at the EU level under the Emissions Trading System. The decision on the appropriate legislative process will be taken by the European Commission once Opinion No 09/2017 has been provided by EASA.

**Article 2**

p. 10-11

comment

8

comment by: *Airbus*Article 2, points 1 & 4:

	<p>It is questionable whether the possible exemptions have to be granted by Member States to production organisations.</p> <p>The exemption will be granted on the basis of design data, relating to CS-CO2, provided by the design organisation. In the case of a new type certificate, the deviation from CS-CO2 will anyway need to be accepted by EASA for the issuance of the type certificate.</p> <p>Some production organisations are under the direct supervision of EASA, e.g. Airbus. In such a case, can a Member State grant an exemption?</p>
response	<p>Accepted.</p> <p>EASA appreciates the comments provided by Airbus. EASA agrees that the need for an exemption will be based on design data. However, the approval of an exemption to produce and release into service a number of aeroplanes that do not comply with ICAO Annex 16 Volume III is a production-related issue. As such, the regulatory responsibility for approving exemptions lies with the competent authority responsible for the production organisation.</p> <p>Member States are the competent authority for the production organisations located in their State. Where requested by the State(s), EASA can be designated as the competent authority in place of the State(s), as in the case of Airbus. In this situation, EASA would be responsible for issuing any exemption(s). EASA is also responsible for POAs located outside the European Union. It is recognised that EASA and Member States will need to coordinate closely on this issue as stated in the proposed AMC 21A.130 and 21A.165 text.</p> <p>In order to clarify Article 2, the text will be amended to refer to the ‘competent authority’ that is relevant for the specific situation, rather than the Member State.</p>
comment	<p>9 <span style="float: right;">comment by: Airbus</span></p> <p><u>Article 2, point 4:</u></p> <p>Reference to paragraphs 1(d) and 2(c) is inaccurate, as there is no § 1(d) and § 2(c) only contains the maximum number of exempted aircraft. The correct reference is probably paragraphs 2(d) and 3(c).</p>
response	<p>Accepted. Text will be updated.</p>
comment	<p>22 <span style="float: right;">comment by: Airbus</span></p> <p>Article 2 of the amending regulation should give the reference of the article of the Basic Regulation that will be added or amended:</p> <p style="background-color: yellow;">In Regulation (EC) No 216/2008, a new article x is added between articles y and z, as follows:</p> <p>Or:</p> <p style="background-color: yellow;">In Article 6 of Regulation (EC) No 216/2008, paragraphs 2, 3, 4 and 5 are added as follows:</p> <p style="background-color: yellow;">2. Member States may grant...</p>

	<p>3. Exemptions shall be granted...</p> <p>4. Organisations responsible...</p> <p>5. Member States...</p>
response	<p>Not accepted.</p> <p>The amending Commission Regulation has two aims. Article 1 proposes amendments to Article 6 of Regulation (EC) No 216/2008. Article 2 implements the exemption process to the aeroplane CO<sub>2</sub> standard. This is done within the amending Commission Regulation, and does not require amendments to Regulation (EC) No 216/2008.</p>
comment	<p>24 <span style="float: right;">comment by: Airbus Helicopters</span></p> <p>In the draft regulation amending the Basic Regulation (EC) No 216/2008, Article 2 fails to identify which article of the Basic Regulation will be amended or newly created.</p>
response	<p>Not accepted.</p> <p>The amending Commission Regulation has two aims. Article 1 proposes amendments to Article 6 of Regulation (EC) No 216/2008. Article 2 implements the exemption process to the aeroplane CO<sub>2</sub> standard. This is done within the amending Commission Regulation, and does not require amendments to Regulation (EC) No 216/2008.</p>
comment	<p>37 <span style="float: right;">comment by: Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)</span></p> <p>According to paragraph 2.4 the Impact Assessment (IA) has highlighted two scenarios, option 1 and 2, while the actual IA has labeled the same scenarios with 0 and 1 respectively. Swedish Transport Agency would like to highlight that if there are any comments on these scenarios there could be confusion on which scenarios the comment applies to.</p>
response	<p>Accepted. Text will be updated.</p>

**21.A.41 Type-certificate**

p. 13

comment	<p>26 <span style="float: right;">comment by: Airbus Helicopters</span></p> <p><i>"The aircraft type certificate and restricted type certificate data sheet shall include the record of CO<sub>2</sub> emissions compliance"</i></p> <p>It should be made explicit that this requirement is for aeroplanes only.</p>
response	<p>Not accepted.</p> <p>The use of the term 'aircraft type certificate' ensures consistency with the rest of the paragraph. The applicability of the CO<sub>2</sub> standard to 'aeroplanes' is clearly stated in the</p>



applicability requirements of Annex 16 Volume III.

It is also noted that the point 21.A.41 text in the NPA text was outdated and had been revised in a subsequent amendment (i.e. Commission Regulation (EU) No 69/2014, and not Commission Regulation (EU) No 748/2012). The first sentence should have read: 'The type-certificate and restricted type-certificate shall include the type design, the operating limitations...'

### 21.A.91 Classification of changes in type-certificate

p. 13

comment	2	comment by: UK CAA
	<p><b>Paragraph No:</b> 4 - 21.A.91 Classification of changes in type-certificate</p> <p><b>Comment:</b> The UK CAA believes the word 'characteristics' was unintentionally deleted from this paragraph and that it should be reinstated.</p> <p><b>Justification:</b> To correct editorial error.</p> <p><b>Proposed Text:</b> Amend to read as follows:</p> <p>"Changes in type-certificate are classified as minor and major. A 'minor change' is one that has no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, other characteristics affecting the airworthiness of the product, or environmental <b>characteristics</b>. Without prejudice ..."</p>	
response	Accepted. Text will be updated.	
comment	10	comment by: Airbus
	<p>3rd line: the word "characteristics" should not be deleted: "environmental <b>characteristics</b>".</p> <p>Why is it proposed to remove "operational suitability data"? This is not linked to CAEP/10 decisions, and is out of the scope of this NPA. It should not be deleted.</p>	
response	Accepted. Text will be updated.	
comment	27	comment by: Airbus Helicopters
	<p>In "environmental characteristics", the word "characteristics" appears both as struck-through (deleted) and in grey (new or amended).</p> <p>We consider that it is a mistake: "characteristics" should be part of the text.</p>	
response	Accepted. Text will be updated.	
comment	28	comment by: Airbus Helicopters
	<p>"operational suitability data" appears as struck-through (deleted).</p>	

We suppose that it is a mistake.

response Accepted. Text will not be deleted.

**21.A.130 Statement of conformity**

p. 13-14

comment	<p>11 <span style="float: right;">comment by: Airbus</span></p> <p><u>Subparagraph (b)4(i):</u> Engine exhaust emissions are not only NOx emissions. Proposed text modification: "in compliance with the applicable emissions requirements of 21.A.18(b) on the date of manufacture of the engine" or "in compliance with the applicable engine exhaust emissions requirements on the date of manufacture of the engine"</p> <p><u>Subparagraph (b)4(ii):</u> The following is proposed for clarification: "(ii) a statement on whether the aeroplane has been issued produced in accordance with an exemption against the applicable CO2 emissions requirements."</p>
response	<p>(b)4(i) — Accepted. The subparagraph is related specifically to the requirements for in-production aircraft engines and the need for production organisations to ensure compliance against these requirements on the date of manufacture of the engine. EASA notes that ICAO Annex 16 Volume II contains production requirements for more than just NOx emissions. It is therefore proposed to refer to generic ‘applicable engine exhaust emissions’ requirements.</p> <p>(b)4(ii) — Not accepted. EASA proposes to follow the same approach as for (b)4(i). (b)1 ensures compliance with the design data, while (b)4(ii) ensures the aeroplane complies with applicable CO<sub>2</sub> emissions requirements on the date its first certificate of airworthiness is issued. If the aeroplane does not comply, then an exemption is required following the separate process defined in the draft Regulation amending Regulation (EC) No 216/2008. (b)4(ii) would thus read:</p> <p>‘(i) a statement that the completed engine is in compliance with the applicable emissions requirements on the date of manufacture of the engine; and</p> <p>(ii) a statement that the completed aeroplane is in compliance with the applicable CO<sub>2</sub> emissions requirements on the date its first certificate of airworthiness is issued.’</p>
comment	<p>29 <span style="float: right;">comment by: Airbus Helicopters</span></p> <p>We suggest the following text improvement for item (b)4 (additions underlined, suppressions struck-through):</p> <p>"4. <u>additionally, in the case of environmental requirements:</u> (i) <u>For engines,</u> <del>statement that the completed engine is in compliance with the applicable</del></p>

*NOX emissions requirements on the date of manufacture of the engine; and (ii) For aeroplanes, a statement on whether the aeroplane has been issued with an exemption against the applicable CO2 emissions requirements."*

response Not accepted. Clarification that the article is associated with environmental requirements is helpful, and the associated product (engine/aeroplane) is already referred to in the subparagraphs.

### 21.A.147 Changes to the approved production organisation

p. 15

comment 12 comment by: Airbus

21.A.147(a), 3rd line:  
The word "characteristics" should not be deleted in the expression "environmental characteristics".

response Accepted. Text will be updated.

comment 30 comment by: Airbus Helicopters

In "*environmental characteristics*", the word "*characteristics*" should not be deleted.

response Accepted. Text will be updated.

### 21.A.174 Application

p. 15-16

Comment 13 comment by: Airbus

Subparagraph 3(ii), added last bullet:

Used aircraft, for which the first certificate of airworthiness was issued before the applicability date of the CO2 standard, are not supposed to be CO2-certified. Therefore they cannot have a CO2 metric value.

Additionally, an exemption may have been granted, in which case there is no CO2 metric value either.

Proposed text modification:

"- The date on which the first certificate of airworthiness was issued, and the CO2 certification status (Not certified to the CO2 standard, or certified to the CO2 standard with an indication of the current CO2 metric-value data, or exempted).

response Partially accepted. See response to comment #36.

'Used aircraft' in this context refers to those aircraft originating from a non-Member State register. If the aircraft was produced after the type configuration was CO<sub>2</sub>-certified, then it would have an associated CO<sub>2</sub> metric value. However, it is acknowledged that not all used aircraft will have this data, and some may have been issued exemptions.

comment 31 comment by: Airbus Helicopters



	In the last bullet of (b)3., related to CO <sub>2</sub> emissions, the mention that it only applies to aeroplanes should be added.
response	Not accepted. The applicability of the CO <sub>2</sub> standard to 'aeroplanes' is clearly stated in the applicability requirements of Annex 16 Volume III.
comment	36 <span style="float: right;">comment by: <i>Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)</i></span>  The new text " <i>the CO2 metric-value data and the date on which the first certificate of airworthiness was issued.</i> " which is added to Part 21.A.174 (b) 3 (ii) on page 17 should be changed. As the requirement is written in this NPA the applicant shall send in " <i>the CO2 metric-value data</i> " that actually do not exist on a lot of aircraft. Swedish Transport Agency would suggest the following text instead: <b><i>The date on which the first certificate of airworthiness was issued and, if the standards of ICAO Annex 16 Volume III applies, the CO2 metric-value data.</i></b>
response	Accepted. Text will be updated.

**21.A.251 Terms of approval**

p. 16

comment	14 <span style="float: right;">comment by: <i>Airbus</i></span>  Why is it proposed to remove "operational suitability"? This is not linked to CAEP/10 decisions, and is out of the scope of this NPA. It should not be deleted.
response	Accepted. Text will not be deleted.
comment	32 <span style="float: right;">comment by: <i>Airbus Helicopters</i></span>  " <i>operational suitability data</i> " appears as struck-through (deleted). We suppose that it is a mistake.
response	Accepted. Text will not be deleted.

**21.B.326 Certificate of airworthiness**

p. 16-17

comment	15 <span style="float: right;">comment by: <i>Airbus</i></span>  <u>Subparagraph (b)1(iv):</u>  1/ The aircraft could have been granted an exemption on the date on which the certificate of airworthiness was first issued.  2/ Compliance with the applicable CO <sub>2</sub> emissions requirements must be maintained over years, taking into account aircraft configuration evolutions. The status of compliance with the applicable CO <sub>2</sub> emissions requirements for the configuration of the aircraft at the time of new certificate of airworthiness application is therefore more important than at the time of issuance of the first certificate of airworthiness.
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For those reasons, the following text is proposed:

"(iv) the aircraft was in compliance with the applicable CO<sub>2</sub> emissions requirements on the date on which the certificate of airworthiness was first issued, and this compliance has been maintained since then."

Subparagraph (b)3:

For the same reasons as for subparagraph (b)1(iv), the following text is proposed:

"3. when the competent authority of the Member State of Registry is satisfied that the aircraft was in compliance with the applicable CO<sub>2</sub> emissions requirements on the date on which the certificate of airworthiness was first issued, and this compliance has been maintained since then."

response	<p>Not accepted.</p> <p>Ref.: (1) — 21.B.326(b)1(iv) states that the aircraft has to be in compliance with the applicable CO<sub>2</sub> emissions requirements. If an aircraft has been produced in accordance with an exemption, then the CO<sub>2</sub> standard is not applicable.</p> <p>Ref.: (2) — This is covered by 21.B.326 (b)1(i) that refers to the current configuration of the aircraft being in compliance with a type design approved under a type-certificate and any supplemental type-certificate, change or repair approved in accordance with Annex I (Part 21).</p>
comment	<p>33 <span style="float: right;">comment by: <i>Airbus Helicopters</i></span></p> <p>In items (a)3, (b)1.(iv) and (b)3., the mention that these conditions apply for aeroplanes only is missing.</p>
response	<p>Not accepted. 21.B.326(b)1(iv) states that the aircraft has to be in compliance with the <b>applicable</b> CO<sub>2</sub> emissions requirements. The applicability of the CO<sub>2</sub> standard to 'aeroplanes' is clearly stated in the applicability requirements of CS-CO<sub>2</sub> and Annex 16 Volume III.</p>

**3.3. Draft acceptable means of compliance and guidance material (Draft EASA decision) — 3.3.1. AMC/GM to Part-21 — Appendix A to GM21.A.91: Examples of Major Changes per discipline**

p. 27-28

comment	<p>3 <span style="float: right;">comment by: <i>UK CAA</i></span></p> <p><b>Paragraph No:</b> 1 -Appendix A to GM 21.A.91: Examples of Major Changes per discipline – sub-paragraph (iii), 3<sup>rd</sup> bullet</p> <p><b>Comment:</b> The 3rd bullet point should be amended to replace the word 'and' with 'or'</p> <p><b>Justification:</b> To correct editorial error.</p> <p><b>Proposed Text:</b> Amend as follows:</p>
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response	<p>“— a change to the maximum take-off mass; <b>and or</b>”</p> <p>Partially accepted. Propose to delete the word ‘and’, and not replace it with ‘or’, as this is a list of examples and not a list of conditions.</p>
comment	<p>4 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Paragraph No:</b> 1 -Appendix A to GM 21.A.91: Examples of Major Changes per discipline – sub-paragraph (iii), last bullet</p> <p><b>Comment:</b> In the last bullet point, it is not understood what the ‘aeroplane’s reference geometric factor (RGF)’ is. This is a term that is not used in CS-25.</p> <p><b>Justification:</b> Clarification required.</p>
response	<p>Not accepted. The Reference Geometric Factor (RGF) is defined in Annex 16 Volume III as it is specific to the aeroplane CO<sub>2</sub> standard.</p>
comment	<p>16 <span style="float: right;">comment by: Airbus</span></p> <p><u>Paragraph 8 introduction, 2nd subparagraph:</u></p> <p>"No-CO<sub>2</sub> changes" were omitted. Change as follows:</p> <p>"Following the general philosophy of this Appendix, it is preferred to give examples of changes which might have an appreciable effect on a product's environmental characteristics (i.e. the effect might be greater than the no-acoustical change <b>and</b>, no-emissions change <b>and</b> <b>no-CO<sub>2</sub> change</b> criteria) and might therefore lead to a major change classification."</p> <p><u>Paragraph 8(iii), examples of CO<sub>2</sub> emission-related changes:</u></p> <p>It is proposed to change the list as follows:</p> <p>"- a change that may affect the aeroplane's specific air range performance, including <b>one or several of the following</b>:</p> <ul style="list-style-type: none"> <li>• a change that <b>increases</b> affects the aircraft's drag;</li> <li>• a change of engine or, if fitted, propeller type; <b>and</b></li> <li>• <b>a change in engine thrust rating; and</b></li> <li>• a <b>change in the engine combustor design</b> an engine design change that affects the engine Specific Fuel Consumption in cruise." <p>Reasons:</p> <ul style="list-style-type: none"> <li>• One change may have several effects;</li> <li>• The aircraft drag could also be reduced and lead to a major change classification because the applicant may wish to take credit of it.</li> <li>• The thrust needed to balance the drag in cruise will remain unchanged, regardless of the maximum cruise thrust rating. Therefore a change in the maximum cruise thrust rating alone will not affect specific air range. This example should be removed.</li> </ul> </li></ul>

	<ul style="list-style-type: none"> <li>Generally speaking, any change to an engine that impacts the engine specific fuel consumption in cruise should be considered.</li> </ul>
response	<p>Partially accepted.</p> <p>Inclusion of references to a 'no-CO<sub>2</sub> change' in the introduction will be added.</p> <p>In terms of paragraph 8(iii), the use of the term 'increase' is considered clearer than 'affects'. Any reduction in drag which the applicant may wish to take credit for would be on a voluntary basis.</p> <p>The paragraph will be revised as follows:</p> <p>'— a change that may affect the aeroplane's specific air range performance, including one or several of the following:</p> <ul style="list-style-type: none"> <li>a change that increases the aircraft's drag;</li> <li>a change of engine or, if fitted, propeller type;</li> <li>a change in the engine design that affects the engine Specific Fuel Consumption in cruise.'</li> </ul>
comment	<p>34 <span style="float: right;">comment by: Airbus Helicopters</span></p> <p>Where the concept of 'no-CO<sub>2</sub> changes' is introduced, we suggest adding "for aeroplanes" or "where applicable".</p>
response	<p>Not accepted. Annex 16 Volume III applicability requirements and ETM Volume III specifically refer to aeroplanes.</p>

<b>AMC 21A.130(b)(5) Applicable aeroplane CO<sub>2</sub> emissions requirements</b>	p. 30-33
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comment	<p>17 <span style="float: right;">comment by: Airbus</span></p> <p><u>Paragraph 1 - General</u></p> <p>In the second subparagraph, reference is made to Annex 16 Volume III, Part II, chapter 1, paragraph 1.11. This paragraph 1.11 states that "<i>Contracting States shall recognize valid aeroplane exemptions granted by an authority of another Contracting State.</i>" It does not give indications on the exemption process.</p> <p>It would be more appropriate to refer to "<i>Volume III, Part II, chapter 2, paragraph 2.1.3</i>", as this paragraph really gives information on the exemption process.</p>
response	<p>Partially agreed. Text will be updated to refer to both Chapter 1, para. 1.11 and Chapter 2, para. 2.1.3 of Annex 16 Volume III to clarify relevant requirements on exemptions.</p>
comment	<p>18 <span style="float: right;">comment by: Airbus</span></p> <p><u>Subparagraph 2.1(c)(iii)(B)</u></p> <p>This sentence is not understood and should be clarified or removed. This is not requested in ETM Volume III.</p>



	<p><u>Subparagraph 2.1(c)(iii)(C)</u> Engine exhaust emissions should be considered, not only NOx emissions. Proposed text modification: "... including community noise and <b>NOx engine exhaust</b> emissions;"</p> <p><u>Subparagraph 2.1(c)(vi)</u> Exemptions are granted to aeroplanes, not to engines. Proposed text modification: "equity issues in administering the production cut-off among economically competing parties (e.g. provide the rationale for granting the exemption when another manufacturer has a compliant <b>engine-aeroplane</b> and does not need an exemption, taking into account the implications for the operator's fleet composition and commonality, as well as related issues in the absence of the <b>engine aeroplane</b> for which exemptions are sought); and "</p>	
response	Accepted. Text will be updated.	
comment	<p>19</p> <p><u>First chart in subparagraph 2.2.4</u></p> <p>To be consistent with the table above the chart, the title of the horizontal axis should be: "% Margin to CAEP/10 In-Production <b>Type</b> Regulatory Level"</p>	comment by: Airbus
response	Partially accepted. The regulatory level is specific to an in-production type. Title in the table above the chart to be made consistent with that of the horizontal axis.	
comment	<p>38</p> <p><u>Paragraph 2.2.3:</u></p> <p>The words "maximum number of potential exemptions" is misleading. There may be one exemption covering several aeroplanes.</p> <p>Suggested wording:</p> <p>2.2.3 The proposed maximum number of <b>potential exemptions potentially exempted aeroplanes</b> should be inversely proportional to the % margin of the CO2 metric value from the regulatory level (Volume III, Part II, Chapter 2, paragraph 2.4). Those aeroplane types with a smaller % margin to the regulatory level should be permitted a larger number of <b>exemptions exempted aeroplanes</b> compared to the aeroplane types with a larger % margin.</p>	comment by: Airbus
response	Partially accepted. Clarification made by changing the text to be in line with the subsequent tables and figures: '2.2.3 The proposed maximum number of potential exempted individual aeroplanes per type certificate should be inversely proportional to the % margin to the CAEP/10 regulatory level (Volume III, Part II, Chapter 2, paragraph 2.4). Those aeroplane types with a smaller % margin to the regulatory level should be permitted a larger number of potential exempted individual aeroplanes per type certificate compared to the aeroplane types with a larger % margin.'	
comment	<p>40</p>	comment by: Transport & Environment

2.1(c)(vi) -

The NPA proposal is clearly in error because the standard is about aeroplane type certification, not engine certification. This should be corrected. In addition if an aeroplane fails the CO<sub>2</sub> standard, but if a suitable engine with better fuel efficiency is available but not applied, then the case should be made (legal issues with trade protection or technical or may be string economic issues), why this engine is not used to improve the aeroplane.

Regarding application of exemptions for InP and NT: for InP there is a fairness argument to grant some exemptions for low volume types. But for new types (NT) we doubt that this is reasonable. The NT regulation is clear and well in advance, so why would one provide an exemption? All manufacturing countries – also new ones - are involved in aircraft to comply with the NT regulation, so the technology clearly is there.

response

Accepted. Paragraph 2.1(c)(vi) will be amended to refer to aeroplane rather than engine.

EASA appreciates and notes the comments provided by Transport & Environment. Availability of other engine types would be considered as part of the justification submitted by the applicant. The NT exemptions were an integral part of the final decision made on the aeroplane CO<sub>2</sub> standard.

#### AMC 21A.165(c)(4) Applicable aeroplane CO<sub>2</sub> emissions requirements

p. 34-37

comment

17 ❖

comment by: Airbus

##### Paragraph 1 - General

In the second subparagraph, reference is made to Annex 16 Volume III, Part II, chapter 1, paragraph 1.11. This paragraph 1.11 states that "*Contracting States shall recognize valid aeroplane exemptions granted by an authority of another Contracting State.*" It does not give indications on the exemption process.

It would be more appropriate to refer to "*Volume III, Part II, chapter 2, paragraph 2.1.3*", as this paragraph really gives information on the exemption process.

response

Partially agreed. Text will be updated to refer to both Chapter 1, paragraph 1.11 and Chapter 2, paragraph 2.1.3 of Annex 16 Volume III to clarify relevant requirements on exemptions.



comment	<p>18 ❖</p> <p><u>Subparagraph 2.1(c)(iii)(B)</u> This sentence is not understood and should be clarified or removed. This is not requested in ETM Volume III.</p> <p><u>Subparagraph 2.1(c)(iii)(C)</u> Engine exhaust emissions should be considered, not only NOx emissions. Proposed text modification: "... including community noise and <b>NOx engine exhaust</b> emissions;"</p> <p><u>Subparagraph 2.1(c)(vi)</u> Exemptions are granted to aeroplanes, not to engines. Proposed text modification: "equity issues in administering the production cut-off among economically competing parties (e.g. provide the rationale for granting the exemption when another manufacturer has a compliant <b>engine-aeroplane</b> and does not need an exemption, taking into account the implications for the operator's fleet composition and commonality, as well as related issues in the absence of the <b>engine aeroplane</b> for which exemptions are sought); and "</p>	comment by: <i>Airbus</i>
response	Accepted. Text will be updated.	
comment	<p>19 ❖</p> <p><u>First chart in subparagraph 2.2.4</u></p> <p>To be consistent with the table above the chart, the title of the horizontal axis should be: "% Margin to CAEP/10 In-Production <b>Type</b> Regulatory Level"</p>	comment by: <i>Airbus</i>
response	Partially accepted. The regulatory level is specific to an in-production type. Title in the table above the chart to be made consistent with that of the horizontal axis.	
comment	<p>20</p> <p>As AMC 21A.165(c)(4) is new, the sentence introducing it should read: "11. <b>New</b> AMC 21A.165(c)(4) is <del>amended</del> <b>inserted</b> as follows:"</p>	comment by: <i>Airbus</i>
response	Accepted. Text will be updated.	
comment	<p>38 ❖</p> <p><u>Paragraph 2.2.3:</u></p> <p>The words "maximum number of potential exemptions" is misleading. There may be one exemption covering several aeroplanes.</p> <p>Suggested wording:</p> <p>2.2.3 The proposed maximum number of <del>potential exemptions</del> <b>potentially exempted aeroplanes</b> should be inversely proportional to the % margin of the CO2 metric value from</p>	comment by: <i>Airbus</i>

the regulatory level (Volume III, Part II, Chapter 2, paragraph 2.4). Those aeroplane types with a smaller % margin to the regulatory level should be permitted a larger number of exemptions exempted aeroplanes compared to the aeroplane types with a larger % margin.

response

Partially accepted. Clarification made by changing the text to be in line with the subsequent tables and figures:

'2.2.3 The proposed maximum number of potential exempted individual aeroplanes per type certificate should be inversely proportional to the % margin to the CAEP/10 regulatory level (Volume III, Part II, Chapter 2, paragraph 2.4). Those aeroplane types with a smaller % margin to the regulatory level should be permitted a larger number of potential exempted individual aeroplanes per type certificate compared to the aeroplane types with a larger % margin.'

#### 4. Impact assessment (IA)

p. 38-41

comment

41

comment by: *Transport & Environment*

The direct effect on the environment is speculative as it is based on the assumption that manufacturers will voluntarily improve their NT aeroplane's performance because of the standard. None of the NT that were considered during the CAEP/10 cycle, were estimated to fail the three NT levels of the standard. The ++ in the table is misleading because the InP effect is restricted to less than 1% of CO<sub>2</sub> emissions, if at all. The column 'social' should read zero because the effects – if any – referred to here are indirect effects from the assumed reduction of emissions and social benefits of the – assumed- reduction of climate change rate caused by this. Direct social impacts are not relevant for the CO<sub>2</sub> standard. This additional column is thus a form of double counting and also misleading.

Another issue is that the standard basically saves the sector costs (see the annexes to the NPA, p333 Figures 13 and 14 for instance). This 'gift' to the industry will tend either to increase profit margins or to reduce ticket costs ultimately generating additional traffic growth. This second order effect has not been accounted for in the CO<sub>2</sub> emission calculations.

An additional factor is that the option 3 delay to 2028 of the InP cut-off (from 2023 date) results in several older aircraft, not complying with the NT standard, to remain in production while newer variants, complying with NT standards, are available. This is true for the A319NEO, A320NEO, A321NEO, A330NEO and the 737-8MAX and 737-9MAX and the B777-9X. Manufacturers will seek profits from continued production of older models as long as the market holds up, while an earlier switch to the 15-20% more fuel efficient newer variants would certainly result in additional CO<sub>2</sub> savings for the coming three decades these newer older variants will likely remain in service. So EASA could still apply the InP option 1 implementation rule, starting in 2023.

response

Partially accepted. Revision to the impact assessment, but no proposed changes to the NPA text.

Costs and benefits were estimated for the purpose of comparative ranking of the CO<sub>2</sub> stringency options. As future market responses to the aeroplane CO<sub>2</sub> standard are unknown, various scenarios were considered. The environmental benefits indeed represent the high end of costs/benefits and should not be taken as absolute numbers. It is correct that the effects of reduced operating costs on demand have not been assessed in the impact



assessment. However, as indicated in the comment, this is expected to be a second-order effect. Market forces are likely to incentivise airlines to opt for the more fuel-efficient aircraft, therefore bringing forward the in-production cut-off date to 2023 (instead of 2028) would bring only marginal additional benefits, while it could create competitive distortion. In reviewing the social impact, it is acknowledged that the effects are indirect. Based on the above, the environmental benefits will be adjusted to '+' and the social impact to '0'.

It is noted that even with a single '+' for environment and '0' for social in the impact assessment, Option 1 is still considered better than Option 0.

comment

42

comment by: *Transport & Environment*

The “No specific monitoring or ex post evaluation is planned for this rule” seems rather bizarre. There should be an early or even annual evaluation considering the impacts of types both InP and NT, discussions, relevance of the CO<sub>2</sub> standard, technological development, etc. Also because the ETM says in 2.5.1.3 “In order to promote a harmonized global approach to the granting, implementing and monitoring of these exemptions, this section provides guidelines on the process and criteria for issuing exemptions from the CO<sub>2</sub> standard agreed at CAEP/10 (Part II, Chapter 2, paragraph 2.4).” which is for exemptions. So some monitoring is necessary anyway.

Monitoring is essential as every year a new type will come on the market, means it will on average be some 0.8% better in fuel efficiency and also its metric. That means that every 3-5 years new type NT aeroplanes will end up with one level (stringency option) better. So the middle of the market new type discussed by Boeing will likely pass S10 and definitely not be influenced by the standard. This all means that the small, if any, effect for NT will fade within a decade, requiring quick evaluations to base new more stringent stringency levels on.

response

Noted. The ICAO Annex 16 Volume I ‘Aircraft Noise’, Volume II ‘Aircraft Engine Emissions’ and Volume III ‘Aeroplane CO<sub>2</sub> Emissions’ requirements will be continuously reviewed within the ICAO CAEP work programme. This will typically involve monitoring newly certified data points to inform discussions on when to review a regulatory limit. In addition, if there are issues identified in implementing the certification requirements during a type certification programme, then these lessons learnt shall be fed back into the CAEP process and the requirements shall be updated.



### 3. Appendix A — Attachments

 [AIA EASA CAEP10 NPA Comments.pdf](#)  
Attachment #1 to comment [#39](#)

