



European Union Aviation Safety Agency
Comment-Response Document 2020-01

RELATED NPA: 2020-01 — RMT.0673 — 22.12.2020

Table of contents

1. Summary of the outcome of the consultation	2
2. Individual comments and responses	4



1. Summary of the outcome of the consultation

104 comments were received from 17 users.

The commentators represented the industry (Airbus, Boeing, Bombardier Aerospace, EBAA, FNAM, groWING, Gulfstream Aerospace, Mitsubishi Aircraft), national aviation authorities (ANAC (Brazil), Austrocontrol, the CAA (Netherlands), CAA (Sweden), DGAC (France), FAA (USA), FOCA (Switzerland), and the LBA (Germany)).

These are the commented segments:

S	Page	Description	Comments
0	-	(General Comments)	6
1	4-9	2.1. Why we need to change the rules—issue/rationale	2
2	9-12	2.3. How we want to achieve it—overview of the proposals	1
3	14	3. Proposed amendments and rationale in detail	1
4	14	CS 25.143 General	1
5	14	AMC 25.143(b)(4)	2
6	15-17	AMC 25.101(g)	3
7	17-18	AMC 25.149(f)	3
8	18-19	AMC 25.149(g)	1
9	19-20	CS 25.954	3
10	20-21	CS 25.981	7
11	21	Appendix H	1
12	21-42	AMC 25.954	5
13	42-80	AMC 25.981(a)	10
14	80	Appendix J	1
15	80-81	AMC 25.785	1
16	81	AMC 25.791	1
17	81	AMC 25.803	1
18	81	AMC 25.807	1
19	81-82	AMC 25.809	2
20	82	AMC 25.810	1
21	82	AMC 25.811	1
22	82	AMC 25.811(d)	1
23	82	AMC 25.812	1
24	83	AMC 25.813	1
25	83	AMC 25.815	1
26	83	AMC 25.819	1
27	83	AMC 25.853	1
28	84	AMC to CS 25.855 and 25.857	1
29	84	AMC to Appendix S, S25.20(b)(2)	1
30	84	AMC 25.562	1
31	84-85	AMC to CS 25.793 and CS 25.810(c)	2
32	85	AMC to CS 25.809(c) and (e)	2

S	Page	Description	Comments
33	85-86	AMC 25.810(a)(1)(v)	2
34	86-87	AMC 25.1411(f)	4
35	87	AMC 25.810	2
36	87	AMC 25.810(c)(2)	1
37	87-88	AMC 25.1581	2
38	88	AMC 25.1	2
39	88-89	AMC 25.831(a)	5
40	89-90	AMC N°1 to CS 25.132	2
41	90-91	AMC 25-11	4
42	91-93	AMC 25.581	1
43	93	AMC 25.899	2
44	93-94	AMC 25.1351(d)	8
45	97	6. References	1



2. Individual comments and responses

In responding to the comments, the following terminology has been applied to attest EASA's position:

- (a) **Accepted** — EASA agrees with the comment and any proposed amendment is wholly transferred to the revised text.
- (b) **Partially accepted** — EASA either partially agrees 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 to be necessary.
- (d) **Not accepted** — The comment or proposed amendment is not agreed by EASA.

(General Comments)	-
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comment	1		comment by: <i>groWING.aero</i>
		The term "Acceptable Means of Compliance" is written inconsistent throughout CS-25 . Sometimes with capital letters, sometimes in small letters . The understanding is, that if referenced to a particular paragraph like "Acceptable Means of Compliance with AMC..." is defining a particular AMC and is therefore a standing term and shall begin with a capital letter. If stipulated as non-standing term, it should begin with small letters like "...could be considered as an acceptable means of compliance."	
response		Accepted. In the subparts affected by this amendment of CS-25 (Amendment 26) it has been updated. For those subparts not affected by amendment 26, it will be changed in future amendments of CS-25.	
comment	4		comment by: <i>Swedish Transport Agency, Civil Aviation Department (Transportstyrelsen, Luftfartsavdelningen)</i>
		Thank you for the opportunity to comment on NPA 2020-01, Regular update of CS-25. Please be advised that there are no comments from the Swedish Transport Agency.	
response		Noted.	
comment	9		comment by: <i>LBA</i>
		The LBA has no comments	
response		Noted.	
comment	10		comment by: <i>CAA-NL</i>
		Please be advised that the CAA-NL does not have any comments on this NPA and supports the proposals.	

response	Noted.
comment	11 comment by: FOCA Switzerland FOCA thanks EASA for the opportunity to comment on this NPA. We do not have any further comments.
response	Noted.
comment	89 comment by: Corina Stiubei Thank you for the opportunity to comment. As an organisation, EBAA does not have any specific comments.
response	Noted.

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

p. 4-9

comment	12 comment by: Airbus-Regulations-SRg Page 6, Item 4.8 discussion <u>Airbus comment:</u> Airbus would like to 'highlight' that the statement made by the EASA relates to specific designs only in which the pressurized cylinder used for the inflation is installed in non-pressurized area -- but other design solutions exist with installation of the bottles in pressurized area and for which the reduction of energy will not occur. So the statement that made by EASA should consider a broader number of design options with respective rationale in support of the combined conditions requested by AMC25.810.
response	Noted. The proposed new paragraph in AMC 25.810 is indeed intended to address the case of installation in non-pressurised areas. But this provision does not preclude other kinds of installation.
comment	106 comment by: National Civil Aviation Agency - ANAC Brazil FTHWG proposal in Topic 18 has additional differences to the CS 25 which are not discussed in this NPA (see, for example, FTHWG Topic 18 Report Pages 17 and 18). It is important to know if EASA will consider the other recommendations from the report. Note also that some points which are current on CS 25 received dissenting votes in the same report.
response	Accepted.



AMC 25.143(b)(4) has also been further amended taking into account the FTHWG Topic 18 Report.
 AMC 25.119 has been amended as recommended by the FTHWG report.

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

p. 9-12

comment 7

comment by: FAA

Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution
12 of 98	1st	EASA proposes to clarify in AMC 25.831(a) that an indication of the status of the system is not sufficient, but that an alert should be triggered after the end of the allowed limited time period if the air conditioning system is still in the 'off' position.	The current cabin pressurization warning (i.e., per 25.841(b)(6)) ensures an alert is provided to the flight crew if the cabin pressure exceeds 10,000 feet. Triggering an additional alert during a busy crew workload event (takeoff) based upon a time limit would require airplane manufacturers compute times for various airplane weights and airport field elevations. It would complicate the warning system hardware and software that provide the 25.841(b)(6) warning by adding in time as a factor for consideration in addition to pressure. It is questionable whether such a system would achieve an increase in safety. In addition, the "maximum allowed time period (e.g. typically after the take-off)" is not defined. Is the time measured after engine throttle/power change	The recommendation is that this change to AMC 25.831(a) should not be made at this time. Additional guidance is required to define the acceptable compliance time permitted. EASA should request foreign regulatory and industry participation in developing guidance or a standard to provide the intended improvement in safety



			or time after weight-off-wheels? EASA should provide further definitions for acceptable compliance.	
response	<p>Not accepted.</p> <p>This part of AMC 25.831(a) was already introduced in CS-25 Amdt 23 after the public consultation of NPA 2018-05. The purpose of the proposed change in this NPA is to make a clarification taking into account a comment received on NPA 2018-05 from the flight crew union, SNPL France. EASA has discussed this proposal with industry before making this proposal.</p>			

3. Proposed amendments and rationale in detail

comment

8

comment by: FAA

Page Number	Paragraph Number	Referenced Text	Comment/Rationale or Question	Proposed Resolution
14	2.1	General to the entirety of 2.1 and also to specific parts that as are obvious when reading the comment.	<p>Somatogravic illusion is in fact an illusion and affects pilots perceptions. No amount training is going to address this problem. Specifically,</p> <p>1. This document should acknowledge that at least 3 catastrophic accidents have occurred as a result of somatogravic illusion..</p> <p>2. The surprise factor will be difficult to address. The new guidance states that the average pilot should be able to deal with this type of go-around. But how can you know the average pilot unless you conduct hazard assessment with many pilots of varying skill level.</p> <p>3. Somatogravic illusion can occur in other that go around maneuvers. For example Africa occurred on a bothched approach after a EPGWS waring</p> <p>4. Somatogravic illusion often occurs when the airplane is very light and therefore achieves very high performace. This should be included in training</p>	<p>1. Provide guidelines to conduct a hazard assessment that will assess average/low average pilot skill level, & use this knowledge to develop training as well as the possibility limiting the accelerations that cause SI. This assessment</p>



			<p>5. One recent somatogravic involved accident came after a failure where the airplane not close to the ground went into go-around mode, the crew reaction to this was to trim the airplane to far nose down. beyond the point of recovery.</p> <p>6. Somatogravic illusion can occur in weather. How can you assess or train a pilot to detect SI during failure conditions or bad weather or both.</p>	<p>t should also address SI resulting from failures & weather. 2</p> <p>Encourage applicants to provide systems that have adequate reliability to address EPGWS and go-around not requiring pilot intervention & in fact not allowing pilot intervention. 3. Provide training to pilots that the likelihood of SI is greater when the airplane is very light low fuel and pay load. 4. Use electronic engine controls to limit the accelerations that might lead</p>
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				a pilot to Sl..
response	<p>Noted.</p> <p>The comment mainly relates to actions to improve pilot training to identify and cope with the risk of somatogravic illusions during go-around. This falls out of the scope of the commented AMC amendment.</p> <p>Training-related actions were already performed in the frame of Rulemaking Task RMT.0581 on ‘Loss of Control Prevention and Recovery Training’, which led to an amendment of Regulation (EU) No 1178/2011 by Commission Regulation (EU) 2018/1974 at the end of 2018, and to the related AMC and GM at the beginning of 2019 (ED Decision 2019/005/R).</p> <p>Regarding the CS-25 aspects, please refer to NPA 2017-06 and CRD 2017-06 to understand why and how CS-25 was amended to mitigate this risk at the design level.</p>			

CS 25.143 General

p. 14

comment	38	comment by: <i>FNAM</i>
	<p>"Simplification of definitions related to a go-around.</p> <p>Position: Neutral impact. "</p>	
response	Noted.	

AMC 25.143(b)(4)

p. 14

comment	39	comment by: <i>FNAM</i>
	<p>"Simplification of definitions related to a go-around.</p> <p>Position: Neutral impact. "</p>	
response	Noted.	

comment	81	comment by: <i>Gulfstream Aerospace Corporation</i>				
	<table border="1"> <thead> <tr> <th>Section/Page</th> <th>Comment</th> </tr> </thead> <tbody> <tr> <td>3.1 / pg 14, AMC 25.143(b)(4)</td> <td>Although the change to AMC 25.143(b)(4) shown here matches the proposal from the FTHWG, there are other differences between the current AMC and the FTHWG proposed guidance material.</td> </tr> </tbody> </table>		Section/Page	Comment	3.1 / pg 14, AMC 25.143(b)(4)	Although the change to AMC 25.143(b)(4) shown here matches the proposal from the FTHWG, there are other differences between the current AMC and the FTHWG proposed guidance material.
Section/Page	Comment					
3.1 / pg 14, AMC 25.143(b)(4)	Although the change to AMC 25.143(b)(4) shown here matches the proposal from the FTHWG, there are other differences between the current AMC and the FTHWG proposed guidance material.					



	Recommend that EASA align more completely with the proposed guidance material from the FTHWG.
response	Accepted. AMC 25.143(b)(4) has been further amended using the FTHWG report recommendation.

AMC 25.101(g)

p. 15-17

comment	23	comment by: <i>AIRBUS</i>
	<p>1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.101(g)</p> <p>2. PROPOSED TEXT / COMMENT: CS 25.101(g) requires that procedures for the execution of go-arounds from a landing configuration (identified as "balked landings" in this AMC) and from an approach configuration (identified as "missed approaches" in this AMC) associated with the conditions prescribed in CS 25.119 and CS 25.121(d) must be established</p> <p>3. RATIONALE / REASON / JUSTIFICATION for the Comment: Airbus suggests that providing a definition of "Balked landings" and "Missed approaches" would be beneficial to the understanding of the AMC. For this reason, the first sentence of 1. General is proposed to be updated as highlighted above.</p>	
response	Accepted.	

comment	40	comment by: <i>FNAM</i>
	<p>"Amendment of this AMC in order to provide detailed and acceptable indications on the flight profile during a go-around.</p> <p>Position: Positive impact: precise indications on the go-around tests to be carried out in a simulator. "</p>	
response	Noted.	

comment	107	comment by: <i>National Civil Aviation Agency - ANAC Brazil</i>
	<p>ANAC considers that if compliance demonstrations related to landing phase used any additive to VREF such information should be clear in the AFM. This is a general concern applicable to different requirements to make it clear to operators how the aircraft was tested.</p> <p>In the particular case of 25.101(g), since the proposed guidance allows VREF additives, it should also request this information in the AFM. A simple proposal would be:</p>	



response

(i) All engines operating (AEO) and the thrust or power initially set for a 3 degree approach, and the configuration and final approach airspeed consistent with the AEO landing procedure (not more than VREF + 5 kt and presented in the AFM) in zero wind conditions,

Noted.

EASA considers that this topic should be addressed in a broader way and not only limited to CS 25.101(g) .

This point could be further discussed within the FTHWG to reach harmonisation with FAA, ANAC and TCCA.

AMC 25.149(f)

p. 17-18

comment

25

comment by: AIRBUS

1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:
AMC 25.149(f)

2. PROPOSED TEXT / COMMENT:

Airbus suggests at least that a link is explicitly made between AMC 25.149 and AMC 25.149(f) to explain they are complementary AMC.

3. RATIONALE / REASON / JUSTIFICATION for the Comment:

AMC 25.149(f)(a) is suggesting that dynamic VMCL is critical. However, Airbus recalls that the following already exists in AMC25.149.

1 [...] . A small number of 'dynamic' tests, in which sudden failure of the critical engine is simulated, should be made in order to check that the VMCLs determined by the static method are valid.

It looks quite similar and having comparable things in two different paragraphs may generate confusion.

response

Not accepted.

AMC 25.149 is general, and it is complemented by additional specific AMC for some sub-paragraph of CS 25.149. They are all referenced in CS 25.149 and they all have to be taken into account by applicants. This situation is the same for various other CS and AMC paragraphs throughout CS-25.

comment

26

comment by: AIRBUS

1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:
AMC 25.149 (not proposed to be amended in this NPA)

2. PROPOSED TEXT / COMMENT: Suggested change

Airbus believes that dynamic VMC could be primarily applicable to VMCL rather than VMCA and suggests that EASA takes the opportunity of this NPA to clarify the situation.

3. RATIONALE / REASON for comment: Justification



	With the proposed amendment of AMC 25.149(f), this NPA is further developing on dynamic VMCL while nothing is provided for VMCA. How to interpret this as an OEM ? Because an A/C shall not be flying at VMCA while it can fly at VMCL (approach speed at light weight), one can consider that dynamic check is of interest for VMCL only. This thought is reinforced by the fact that 25.143(b)(1) and corresponding AMC already address sudden engine failure at T/O "at the lowest speed recommended for initial steady climb with all engines operating after take-off" so potentially at speed as close as possible to VMCA.
response	Noted. This topic goes beyond the scope of the NPA. A discussion may be proposed within the FTHWG.

comment	41 comment by: <i>FNAM</i> "Amendment of this AMC in order to harmonize with document FAA Advisory Circular AC 25-7D. Position: Positive impact: precise indications on the tests to be carried out in order to determine the VMCL and VMCL-2 speeds. "
response	Noted.

AMC 25.149(g)

p. 18-19

comment	42 comment by: <i>FNAM</i> "Amendment of this AMC in order to harmonize with document FAA Advisory Circular AC 25-7D. Position: Positive impact: precise indications on the tests to be carried out in order to determine the VMCL and VMCL-2 speeds. "
response	Noted.

CS 25.954

p. 19-20

comment	29 comment by: <i>AIRBUS</i> 1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: Item 3: Fuel tank and system lightning protection - Amend CS 25.981 – Section 3.1 page 20 2. PROPOSED TEXT / COMMENT: Airbus request the following text change: FROM
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CS 25.981 Fuel tank ignition explosion prevention

(See AMC 25.981)

(a) (...)

(3) Demonstrating that an ignition source does not result from each single failure and from all combinations of failures not shown to be Extremely Improbable as per 25.1309. (See AMC 25.981(a))

Except for ignition sources due to lightning addressed by CS 25.954, demonstrating that an ignition source could not result from each single failure, from each single failure in combination with each latent failure condition not shown to be extremely remote, and from all combinations of failures not shown to be extremely improbable, taking into account the effects of manufacturing variability, ageing, wear, corrosion, and likely damage.

TO

Except for ignition sources due to lightning addressed by §25.954, demonstrating that failure conditions creating a fuel tank ignition source comply with CS 25.1309(b)(1), (b)(4) and (b)(5)

3. RATIONALE / REASON / JUSTIFICATION for the Comment:

EASA is justifying the proposed change to CS 25.981(a)(3) by the need to harmonize with the FAA final rule [Docket No. FAA-2014-1027; Amendment No. 25-146].

Airbus support the harmonization with the FAA for the lightning protection aspects of the Fuel Tank Ignition Risk compliance demonstration. Hence Airbus has no comment to the change related to 25.954 and to most of the proposed AMC 25.954. However, with the proposed 25.981 change, EASA is going beyond the harmonization of the latest lightning protection standard for fuel tank ignition prevention. EASA is also surreptitiously adopting the 'from each single failure in combination with each latent failure condition not shown to be extremely remote' provision of FAR 25.981(a)(3) for the non-lightning protection related aspects. EASA historically had rejected this specific 'latent + 1' provision and instead wisely adopted a wording which required a compliance demonstration with the 25.1309 safety provisions applicable to all other aircraft systems (refer to adoption of CS25.981 amendt 1 and NPA 10/2004 in particular following extract: This rulemaking also adds a new paragraph (a)(3) to require that a safety analysis be performed to demonstrate the presence of an ignition source in the fuel tank. Contrary to FAR-25 proposal, which is requiring that an ignition source could not result from any single failure in combination with any latent failure condition not shown to be extremely remote, the proposed JAR 25.981(a)(3) is referring directly to JAR 25.1309. The JAA do consider that the latent failure consideration proposed in FAR 25.981(a)(3) is not consistent with the assessments performed for the other systems, and in some areas of the fuel system, be inappropriate. Direct reference to 1309 will ensure enforcement of consistent, well-accepted criteria.).

Airbus is not aware of any pressing requirement to change the paradigm on this topic and to impose unduly stringent requirements to the fuel system ignition risk. It should continue to be assessed as per 25.1309. EASA is not including in its rationale for the NPA any argumentation detailing why the methodology used in the past 20 years would not be valid anymore. Noting that §25.1309 has evolved on its side in particular for the consideration of latent failures (refer to Amendt 24 of CS 25), Airbus is consequently proposing a wording change enabling to refer to the pertinent provisions.



response Not accepted.
EASA had considered the option proposed in this comment but decided that harmonising with the FAA is the best option.
Furthermore, the last part of the commented paragraph ('taking into account the effects of manufacturing variability, ageing, wear, corrosion, and likely damage ') is deemed very important, as demonstrated by the in-service experience with recent aeroplane types (e.g. Airbus A350).

comment 43 comment by: *FNAM*
"This new point describes the criteria for protecting fuel systems following the lightning strike of an aircraft.

Position: Neutral impact: the fuel system protection criteria are already taken into account during industrial production. Besides, rigorous control and monitoring of its systems is carried out by the operators operating the aircraft. "

response Noted.

comment 90 comment by: *The Boeing Company*

Page:19 -20
Paragraph: *Item 3, 25.954 (d)*

THE PROPOSED TEXT STATES:

(d) To protect design features that prevent catastrophic fuel vapour ignition caused by lightning, the type design must include critical design configuration control limitations (CDCCLs) identifying those features and providing information to protect them. To ensure the continued effectiveness of those design features, the type design must also include inspection and test procedures, intervals between repetitive inspections and tests, and mandatory replacement times for those design features used in demonstrating compliance with sub-paragraph (b) of this paragraph. The applicant must include the information required by this sub-paragraph in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by CS 25.1529.

REQUESTED CHANGE:

The following text change is also being requested in the same manner in a comment for 25.981(d)

(d) To protect design features that prevent catastrophic fuel vapour ignition caused by lightning, the type design must include critical design configuration control limitations (CDCCLs) identifying those features and providing information to protect them. ***CDCCLs are not required for those features where the failure mode is detectable (e.g. addressed at dispatch). For the remaining design features, CDCCLs shall be established for any latent failure in a combination where the remaining feature(s) failure(s) combination is greater than extremely remote, including consideration for flammability and critical lightning strikes.*** To ensure the continued effectiveness of those design features, the type design must also include inspection and test procedures, intervals between repetitive inspections and tests, and mandatory replacement times for those design features, used in demonstrating compliance with sub-paragraph (b) of this



paragraph. The applicant must include the information required by this sub-paragraph in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by CS 25.1529.

JUSTIFICATION:

This paragraph change as requested will need later CS - FAR harmonization but it is more consistent and harmonized with CS 25.1309 with the changes requested. Now with CDCCL added to CS 25.954, it is essential that 901, 954, 981, and 1309 be both internally (CS) and externally (FAR) harmonized as a requirement. It is further requested that an industry wide team be put together consisting of regulators, OEMs, and airlines to develop a (d) CDCCL paragraph that is better defined, explicit, and makes CDCCL determination less subjective such as proposed in the requested text changes.

Years of experience has shown 25.981 CDCCL/ALI type AWLs to be burdensome to develop, maintain, and use, as well as the meaning can be re-interpreted at a later time, and has also shown that CDCCLs should be reserved for relatively high probability latent PDF failures that would also have an ALI.

This NPA paragraph (d) as written, leaves how to approach defining CDCCL and inspections (ALI) to the subjective view of those working project by project instead of a standardized approach. This issue of a lack of standardized approach has been discussed and presented to the FAA as it relates to 25.981 and has not yet been resolved, and now with the intent of this NPA where 2 regulators will carry the requirement in 2 rules, it needs to be better developed and standardized.

Although this NPA paragraph copies the text of the FAA's regulation, and it is good in general that the regulations be harmonized, the text of CDCCL and inspections is not well defined in practice and is not yet well developed, and this as harmonized puts the revised CS in a burdensome direction.

In the FAA's AC 25.981 -1D, too many features become identified as CDCCL, including protection design features (PDF) where the failure mode is detectable (addressed at dispatch), and where specific installation location PDF failure rates are less than extremely remote. Also, there is no standard for feature identification by general type installation, or specific installation PDF protection design features in a CDCCL. This results in excessive, inconsistent, and somewhat arbitrary identification of CDCCL and ALI.

response

Not accepted.

The comment is noted. The suggestion goes beyond the scope of this regular update NPA. A change of this specification in the future should rather be done in harmonisation.

Regarding the standardisation of feature identification, this may be addressed by an industry standard.

CS 25.981

p. 20-21

comment 30

comment by: AIRBUS



	<p>PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:</p> <p>Item 3: Fuel tank and system lightning protection - Amend CS 25.981 – Section 3.1 page 21 – AMC 25.954 and Section 3.1 page 42 – AMC 25.981</p> <p>PROPOSED TEXT / COMMENT:</p> <p>Incorporate a table of content at the top of each AMC</p> <p>RATIONALE / REASON for comment: Justification Facilitate use of these two long and dense AMC</p>
response	Accepted.

comment	<p>44 comment by: <i>FNAM</i></p> <p>"This item describes the criteria for preventing ignition, other than lightning, in aircraft fuel systems. This item is amended for items (a) (3) and (d).</p> <p>Position: Neutral impact: the criteria for preventing ignition of fuel systems are already taken into account during the production phase. On the other hand, rigorous control and monitoring of its systems is carried out by the operators operating the aircraft. "</p>
response	Noted.

comment	<p>82 comment by: <i>Gulfstream Aerospace Corporation</i></p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 20%;">Section/Page</th> <th>Comment</th> </tr> </thead> <tbody> <tr> <td>3.1 / pg 20, CS 25.981</td> <td>The current CFR 25.981 includes subparagraph (c) whereas the current CS 25.981 has subparagraph (c) reserved. As a result, the current CFR 25.981(d) refers to subparagraphs (a), (b), and (c), and the current CS 25.981(d) refers to subparagraphs (a) and (b). This difference seems to remain in the proposed CS, so it's not clear how the EASA intent of harmonization is met. It is possible that this difference may not have an impact on industry unless there's an applicant that intends to certify via CFR 25.981(c).</td> </tr> </tbody> </table>	Section/Page	Comment	3.1 / pg 20, CS 25.981	The current CFR 25.981 includes subparagraph (c) whereas the current CS 25.981 has subparagraph (c) reserved. As a result, the current CFR 25.981(d) refers to subparagraphs (a), (b), and (c), and the current CS 25.981(d) refers to subparagraphs (a) and (b). This difference seems to remain in the proposed CS, so it's not clear how the EASA intent of harmonization is met. It is possible that this difference may not have an impact on industry unless there's an applicant that intends to certify via CFR 25.981(c).
Section/Page	Comment				
3.1 / pg 20, CS 25.981	The current CFR 25.981 includes subparagraph (c) whereas the current CS 25.981 has subparagraph (c) reserved. As a result, the current CFR 25.981(d) refers to subparagraphs (a), (b), and (c), and the current CS 25.981(d) refers to subparagraphs (a) and (b). This difference seems to remain in the proposed CS, so it's not clear how the EASA intent of harmonization is met. It is possible that this difference may not have an impact on industry unless there's an applicant that intends to certify via CFR 25.981(c).				
response	<p>Noted.</p> <p>CS 25.981(b) is not fully harmonised with FAR 25.981(b). The EASA sub-paragraph (1) is indeed maintained as it is deemed an important point on the fundamental design precautions to be taken ('design precautions must be taken to prevent the likelihood of flammable vapours within the fuel tanks by limiting heat and energy transfer'). CS 25.981(b)(4) contains an exclusion criterion equivalent to FAR 25.981(c).</p>				



comment 91

comment by: The Boeing Company

Page: 20

Paragraph: **CS 25.981 (a)(3), (d)****The proposed text states:**

(a)(3) Except for ignition sources due to lightning addressed by CS 25.954, demonstrating that an ignition source could not result from each single failure, from each single failure in combination with each latent failure condition not shown to be extremely remote, and from all combinations of failures not shown to be extremely improbable, taking into account the effects of manufacturing variability, ageing, wear, corrosion, and likely damage.

(d) To protect design features that prevent catastrophic ignition sources within the fuel tank or fuel tank system according to sub-paragraph (a) of this paragraph, and to prevent increasing the flammability exposure of the tanks above that permitted in sub-paragraph (b) of this paragraph, the type design must include critical design configuration control limitations (CDCCLs) identifying those features and providing instructions on how to protect them. To ensure the continued effectiveness of those features, and prevent degradation of the performance and reliability of any means provided according to sub-paragraphs (a) or (b) of this paragraph, the type design must also include the necessary inspection and test procedures, intervals between repetitive inspections and tests, and mandatory replacement times for those features. The applicant must include information required by this sub-paragraph in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by CS 25.1529. The type design must also include visible means of identifying critical features of the design in areas of the aeroplane where foreseeable maintenance actions, repairs, or alterations may compromise the CDCCLs.

REQUESTED CHANGE:

Replace the text with (a)(3) with the following:

(a)(3) **Except for ignition sources due to lightning addressed by CS 25.954, demonstrating that an ignition source does not result from each single failure and from all combinations of failures not shown to be Extremely Improbable as per 25.1309. (See AMC 25.981(a))**

Revise the text of (d) with the additions and deletions as shown in the following:

(d) To protect design features that prevent catastrophic ignition sources within the fuel tank or fuel tank system according to sub-paragraph (a) of this paragraph, and to prevent increasing the flammability exposure of the tanks above that permitted in sub-paragraph (b) of this paragraph, the type design must include critical design configuration control limitations (CDCCLs) identifying those features and providing instructions on how to protect them – **except that CDCCLs do not need to be identified for those features where the failure mode is detectable (addressed at dispatch)**. To ensure the continued effectiveness of those **latent** features, and prevent degradation of the performance and reliability of any means provided according to sub-paragraphs (a) or (b) of this paragraph, the type design must also include the necessary inspection and test procedures, intervals between repetitive inspections and tests, and mandatory replacement times for those features **for any latent failure in a combination, where the**



remaining feature(s) failure combination is greater than extremely remote. The applicant must include information required by this sub-paragraph in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by CS 25.1529. ~~Visible means of identifying critical features of the design must be placed in areas of the aeroplane where foreseeable maintenance actions, repairs, or alterations may compromise the critical design configuration control limitations (e.g., colourcoding of wire to identify separation limitation). These visible means must also be identified as CDCCL.~~

JUSTIFICATION:

(a)(3) as presently written (pre NPA) is well harmonized with 25.1309. As the lightning threat design is not system orientated, but installation related, moving the lightning requirements to 25.954 and harmonizing with FAA 25.954 is acceptable except for 954(d).

(a)(3) as harmonized in the NPA text takes it out of general requirement harmony with other systems where failure combinations can be catastrophic. This CS should retain its system harmonization with CS 25. 1309. This also has an effect on what is required by (d) as far as what gets identified as CDCCL.

(d) is not a well defined requirement and is open to interpretation on what is a CDCCL and whether it can be written for general design features, or has to be written for specific design features. Leaving the text as it is continues its' revision level connection to (a)(3). Visible means is (are) not practical, and has not been put into practice and based lack of practicality, it should be deleted by this NPA. Also (d) has not yet settled to a standard interpretation or approach --- and the result is that different projects have many differing sets of CDCCL and so the paragraph needs further development to arrive to a standardized CDCCL determination.

This comment, summarized, is that this NPA 25.981 change takes the CS out of harmony with the other CS and that CDCCL requirement is not ready for harmonization as there is no standardized way to meet this requirement and it is presently unbounded, except exhaustively which would dilute the intent to preserve latent features. Although there has been much effort in many projects to establish CDCCL identification, the process remains in an immature state. Therefore both (a)(3) and (d) should not be fully harmonized at this time with FAA regulations until a compliance approach accomplished by an industry team be established.

response Not accepted.
Please refer to the response to comment No 90.

comment 92 comment by: *The Boeing Company*

Page: 20
Paragraph: **CS 25.981 (a)(3)**



THE PROPOSED TEXT STATES:

Except for ignition sources due to lightning addressed by CS 25.954, demonstrating that an ignition source could not result from each single failure, from each single failure in combination with each latent failure condition not shown to be extremely remote, and from all combinations of failures not shown to be extremely improbable, taking into account the effects of manufacturing variability, ageing, wear, corrosion, and likely damage.

REQUESTED CHANGE:

Revise text to delete the word “extremely”

Except for ignition sources due to lightning addressed by CS 25.954, demonstrating that an ignition source could not result from each single failure, from each single failure in combination with each latent failure condition not shown to be **extremely** remote, and from all combinations of failures not shown to be extremely improbable, taking into account the effects of manufacturing variability, ageing, wear, corrosion, and likely damage.

JUSTIFICATION:

If the global comment on NPA 25.981 is not accepted, this comment suggests a text modification to the NPA text of (a)(3) that continues to be consistent with CS 25.1309.

The EASA CS as it exists today before EASA NPA 2020-01 is consistent with all other systems safety and airworthiness requirements. By bringing in the text from the FAA 25.981(a)(3), it singles out ignition sources to extreme design requirements while negligibly affecting CSF&L and other safety.

By referring back to CS 25.1309, the EASA CS safety and compliance approach is consistent across all airplane systems, and that approach has been proven safe by many decades of in-service experience. It is better to leave it in this form, and instead harmonize the EASA CS and FAA regulation together, trimming, as described following, the FAA’s excessive *latent plus one* requirement. However, another approach is to delete the word “extremely” and it also stays consistent with CS 25.1309.

Both the single and multiple (detectable and latent) failure, requirements are already well described in 1309, and do not need to be redundantly described in 25.981 which is the way the EASA CS has been written for many years. The addition of “from each single failure in combination with each latent failure condition not shown to be extremely remote,” is not consistent with the next phrase where “and from all combinations of failures not shown to be extremely improbable”, when those failures are detectable. When failures are detectable, each protection design feature (PDF) failure can be remote. However, another approach is to delete the word “extremely” and it also stays consistent with CS 25.1309.

The intent of the latent failure probability is to make it equivalent to a detectable failure, and so it should be “from each single failure in combination with each latent failure condition not shown to be remote”. For any dispatch, whether the failure is latent or detected, then the dispatch safety remains the same. In practice, the latent failure design feature(s) will actually be better with at least 3



PDFs, since inspections (ALIs) would have to be very short, uneconomic, intervals for only 2 features (PDF).

For a “remote latent” requirement, and to have reasonable inspection intervals, a “remote” requirement would drive additional design features for latent failure PDFs. This review shows how excessive “extremely remote” is as a requirement and the CS should not be harmonized in the direction of the FAA regulation. Instead, the FAA regulations should be revised to be harmonized with the EASA text, along with the specific change to the text to “... with each latent failure condition not shown to be remote”

The task of harmonization should be done based on what actually is an airworthiness requirement. As the clause “...with each latent failure condition not shown to be extremely remote” is always referred to a “enhanced safety criteria”, it is never the basis for determining airworthiness, only compliance. The intent of the regulations are to provide airworthiness requirements, and this part of the regulation has continued to be proven by in-service experience to be excessive, costly, and has negligible contribution to safety.

response Not accepted.
Please refer to the response to comment No 90.

comment 93

comment by: *The Boeing Company*

Page: 20

Paragraph: **CS 25.981 (d) < except the last sentence >**

THE PROPOSED TEXT STATES:

To protect design features that prevent catastrophic ignition sources within the fuel tank or fuel tank system according to sub-paragraph (a) of this paragraph, and to prevent increasing the flammability exposure of the tanks above that permitted in sub-paragraph (b) of this paragraph, the type design must include critical design configuration control limitations (CDCCLs) identifying those features and providing instructions on how to protect them. To ensure the continued effectiveness of those features, and prevent degradation of the performance and reliability of any means provided according to sub-paragraphs (a) or (b) of this paragraph, the type design must also include the necessary inspection and test procedures, intervals between repetitive inspections and tests, and mandatory replacement times for those features. The applicant must include information required by this sub-paragraph in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by CS 25.1529.

REQUESTED CHANGE:

Revise as follows:

To protect design features that prevent catastrophic ignition sources within the fuel tank or fuel tank system according to sub-paragraph (a) of this paragraph, and to prevent increasing the flammability exposure of the tanks above that



permitted in sub-paragraph (b) of this paragraph, the type design must include critical design configuration control limitations (CDCCLs) identifying those features and providing instructions on how to protect them – *except that CDCCLs do not need to be identified for those features where the failure mode is detectable (addressed at dispatch)*. To ensure the continued effectiveness of those *latent* features, and prevent degradation of the performance and reliability of any means provided according to sub-paragraphs (a) or (b) of this paragraph, the type design must also include the necessary inspection and test procedures, intervals between repetitive inspections and tests, and mandatory replacement times for those features *for any latent failure in a combination, where the remaining feature(s) failure combination is greater than extremely remote*. The applicant must include information required by this sub-paragraph in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by CS 25.1529.

JUSTIFICATION:

If the global comment on NPA 25.981 is not accepted, this comment suggests a text modification to the NPA text of (d) that continues CS 25.1309 harmonization.

It is recognized that these added clauses will need to be harmonized in the future with the FAA regulations.

The intent of (d) in combination with (a)(3) is to ensure that an airplane is airworthy, and more specifically any airplane at dispatch is not one high probability failure away from a possible ignition source. Since a fuel tank also has to be flammable, the failure probability should be less than remote. This is the approach used in the harmonized CS 25.954 (a),(b),(c). Writing CS 25.981 (a)(3) as commented above, the criteria is consistent to itself by this approach to the comments provided for CS 25.981(d).

CS 25.981(d) proposed text revision keeps the identification of CDCCL and inspections (ALI) in alignment with 25.981(a)(3). As detectable failures have high airplane level (per-flight) visibility, it is not useful to identify them additionally in CDCCL text. The useful purpose of CDCCL is to identify those features that fail latently, and assure that the feature's protection aspect is maintained to support airworthy dispatch. In CS 25.1309 and FAR 25.1309, only the inspection of a latent feature's failure is required by the use of a CMR, while a CDCCL in 981 does add the benefit of also covering remove and replacement action of the latent failure protection design feature.

It is proposed that, at this time, a harmonization not be done just between these specific FAA regulation and CS (25.954, 25.981), but that harmonization be done to include 25.901, 25.954, 25.981, and 25.1309, using the 20 years of experience of the FAA, EASA, the OEMs and the airlines to render the text of the regulation content to what is required for airworthiness, and not stretch into excessive "enhanced safety" which is not cost effective for any organization in the industry.

response

Not accepted.
Please refer to the response to comment No 90.



comment	<p>94</p> <p style="text-align: right;">comment by: <i>The Boeing Company</i></p> <div style="border: 1px solid black; padding: 5px;"> <p>Page: 20 Paragraph: CS 25.981 (d) < last sentence only ></p> <p>THE PROPOSED TEXT STATES: The type design must also include visible means of identifying critical features of the design in areas of the aeroplane where foreseeable maintenance actions, repairs, or alterations may compromise the CDCCLs.</p> <p>REQUESTED CHANGE: <i>Delete the text entirely</i> The type design must also include visible means of identifying critical features of the design in areas of the aeroplane where foreseeable maintenance actions, repairs, or alterations may compromise the CDCCLs.</p> <p>JUSTIFICATION: If the global comment on NPA 25.981 is not accepted, this comment suggests a text modification to the NPA text of (a)(3) that continues CS 25.1309 harmonization.</p> <p>Need for visible means of identification cannot be determined in a quantitative approach, as it offers no material additional protection design feature. Visible identification is mostly impractical for protection design features, and where it can be done practically, such as the jacket color of wiring, the quantitative analysis that identifies the separation as a design feature is better supported by a CDCCL derived from the quantitative analysis. Since visible means of identification is not a protection design feature, but rather is used to highlight a PDF, it should be deleted from the text of the CS. It is noted that the requirements of NPA proposed 25.954(d) does not have this sentence either. Visible means of identification has not been accomplished in practice due to it being impractical.</p> <p>Where there is visible means of identification, it is better written in the AWL as part of the actual PDF CDCCL it is associated with. This could be retained in the AMC as a preferred practice where practical – such as pink jacketed wiring for FQIS tank circuits.</p> </div>
response	<p>Not accepted. Please refer to the response to comment No 90.</p>

Appendix H

p. 21

comment	<p>47</p> <p style="text-align: right;">comment by: <i>FNAM</i></p> <p>"Points (a) (2) and (a) (6) are amended to refer to the addition of points CS.25.954 and CS.25.981.</p>
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	Position: Neutral impact: this amendment does not make any major changes in relation to the points mentioned. "
response	Noted.

AMC 25.954

p. 21-42

comment	37 comment by: AIRBUS Page 35 NPA section 5: Quote: Section H25.4(a)(5) requires CDCCLs, inspections and tests, and mandatory replacement times to be located in a section of the ICA titled 'Airworthiness Limitation. Unquote Reference should be H25.4(a)(6).
response	Accepted.

comment	48 comment by: FNAM AMC 25.954: "This AMC provides details on the tasks to be performed in order to comply with point CS.25.954, including an in-depth assessment method for the probability of breakdowns, lightning strikes and the locations of accessories and the flammability of the tank. fuel. Position: Positive impact: this AMC provides an adapted, complete and precise control method in order to comply with point CS.25.954. " Appendix A: "Addition of definitions of terms used in AMC 25.954. Position: Neutral impact: additional details to the AMC. " Appendix B: "This appendix provides additional examples to the various sub-sections set out in AMC 25.954. Position: Positive impact: additional help in understanding the indications set out in the AMC through simple examples. "
response	Noted. Note: the quoted text in the first paragraph of this comment is different from the NPA text.

comment	96 comment by: The Boeing Company Page: 25 Paragraph: <AMC 25.954> 2.8.1
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THE PROPOSED TEXT STATES:

The use of materials for fuel tank structure that are not highly conductive is considered unusual. Lightning attachment in zone 3 is defined as unlikely in EUROCAE document ED-91A, 'Aircraft Lightning Zoning', dated January 2019 and the equivalent SAE ARP5414B dated December 2018, so the evaluation need not consider failures in combination with such an attachment, but should demonstrate that no catastrophic effect will occur when no failures are present.

REQUESTED CHANGE:

The use of materials for fuel tank structure that are not highly conductive is considered unusual. Lightning attachment in zone 3 is defined as unlikely in EUROCAE document ED-91A, 'Aircraft Lightning Zoning', dated January 2019 and the equivalent SAE ARP5414B dated December 2018, so the evaluation need not consider failures in combination with such an attachment *or the resultant conducted currents*, but should demonstrate that no catastrophic effect will occur when no failures are present.

JUSTIFICATION:

The suggested added wording clarifies the requirement that all threats associated with lightning strikes that do not have a high probability of occurrence do not require a demonstration of fault tolerance.

response

Not accepted.

The intent is to indicate that a direct lightning attachment in zone 3 does not need to be considered. Adding the proposed wording could lead to the wrong assumption that conducted currents are, in general, not to be considered. Besides, the NPA wording is harmonised with the FAA and closer to the proposal initially made by the SAE AE-2 committee and the EUROCAE WG-31 working group on the FAA NPRM for the equivalent rulemaking proposal.

comment

97

comment by: *The Boeing Company*

Page: 26/27

Paragraph: <AMC 25.954> 2.9.4.2

THE PROPOSED TEXT STATES:

Fuel system design elements that are not intrinsically safe and require design features to provide lightning protection should be designed so that a failure associated with these elements or features will not result in an ignition source. Reliable fault-tolerant lightning ignition source prevention, in combination with the fuel tank flammability control required by CS 25.981 and the statistics of lightning strikes to aeroplanes, is acceptable for showing compliance with CS 25.954(c). Detailed guidance for showing compliance for reliable fault-tolerant lightning protection is provided in Section 3 of this AMC.

REQUESTED CHANGE:

Fuel system design elements that are not intrinsically safe and require design features to provide lightning protection should be designed so that a failure



associated with these elements or features will not result in an ignition **source from a highly probable lightning strike. For threats from highly probable lightning attachment, reliable** ~~Reliable~~ fault-tolerant lightning ignition source prevention, in combination with the fuel tank flammability control required by CS 25.981 and the statistics of lightning strikes to aeroplanes, is acceptable for showing compliance with CS 25.954(c). **For threats associated with unlikely lightning attachment (when applicable), demonstration of no catastrophic effects with no failures of reliable lightning ignition source prevention elements or features present, in combination with the fuel tank flammability control required by CS 25.981 and the statistics of lightning strikes to aeroplanes, is acceptable for showing compliance with CS 25.954(c).** Detailed guidance for showing compliance for reliable fault-tolerant lightning protection is provided in Section 3 of this AMC.

JUSTIFICATION:

The suggested added wording clarifies the requirement that all threats associated with lightning strikes that do not have a high probability of occurrence do not require a do not require a demonstration of fault tolerance and that a demonstration of no catastrophic effects with no failures present is acceptable for showing compliance with CS 25.954(c).

response

Not accepted.
The term 'highly probable lightning strike' is not defined in the rule, nor in its AMC. EASA does not intend to introduce such a term.
The proposed additional sentence does not bring clearer information than the already proposed sentence immediately before it.

comment

98

comment by: *The Boeing Company*

Page: 27
Paragraph: <AMC 25.954> 2.9.4.3

THE PROPOSED TEXT STATES:

Certain fuel system design elements and lightning protection features could have conditions where a single failure of these elements or features results in an ignition source when combined with a critical lightning strike.

REQUESTED CHANGE:

Certain fuel system design elements and lightning protection features could have conditions where a single failure of these elements or features results in an ignition source when combined with a critical lightning strike **from a highly probable attachment.**

JUSTIFICATION:

The suggested wording clarifies that an assessment of fault tolerance, thus a classification of non-fault tolerant, is only applicable to ignition sources associated with threats from highly probably lightning attachments. Threats



associated with unlikely lightning attachments are compliant to 25.954(c) when shown to demonstrate that no catastrophic effect will occur when no failures are present, thus are not applicable to be classified as non-fault tolerant.

response Not accepted.
The term 'highly probable lightning attachment' is not defined in the rule, nor in its AMC. EASA does not intend to introduce such a term.

AMC 25.981(a)

p. 42-80

comment

31

comment by: AIRBUS

PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:

Item 3: Fuel tank and system lightning protection - Amend CS 25.981 – Section 3.1 – AMC 25.981 page 55

PROPOSED TEXT / COMMENT

Section 5 – Safety analysis of the proposed AMC should be rewritten consistently with the comment n°1 about CS 25.981(a)(3). As already mentioned in comment 1, the NPA is lacking justifications from EASA for changing the historical position in place in the past 20 years to apply the general 25.1309 system safety approach to the fuel system ignition risk. In the absence of such justifications, Airbus consider that 25.981(a) safety assessment should continue to refer to 25.1309.

The proposed changes to be made to section 5 of the AC include:

- Delete the sentence: The requirements of CS 25.981 are in addition to the more general propulsion failure analysis requirements of CS 25.901 and CS 25.1309 that have been applied to propulsion installations.
- Update § 5.1.1.2 No single failure, regardless of the probability of occurrence, in combination with any latent failure condition not shown to be at least extremely remote (i.e., not shown to be extremely remote or extremely improbable), may cause an ignition source. To reference to CS25.1309(b)(4) and (b)(5) provisions for latent failures
- Remove text of § 5.3.3 about Latent failures and refer to refer to AMC 25.1309 instead (in particular §9.b.6, §9.c, §12 and appendix 5)

RATIONALE / REASON for comment: Justification

The NPA does not contain any rationale supporting the apparent new EASA position to impose more severe safety requirements to the fuel system ignition risk assessment. Airbus is not aware of any recent experience justifying this change. Consequently Airbus consider that EASA should continue to apply to the fuel system ignition risk the same proven safety requirement as for any other aircraft system.

response Not accepted.
Please also refer to the response to comment No 29.



comment	<p data-bbox="379 241 416 271">32</p> <p data-bbox="1129 241 1385 271" style="text-align: right;">comment by: AIRBUS</p> <p data-bbox="379 300 1394 398">PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: Item 3: Fuel tank and system lightning protection - Amend CS 25.981 – Section 3.1 – AMC 25.981 page 65</p> <p data-bbox="379 479 746 539">PROPOSED TEXT / COMMENT Remove the paragraph 6.3.11.</p> <p data-bbox="379 620 967 649">RATIONALE / REASON for comment: Justification</p> <p data-bbox="379 692 1394 1323">This paragraph is redundant and in contradiction with § 4.1.3 page 50 of the AMC. §6.3.11 arbitrarily prescribes a safety assumption (a single fuel pump connector failure can create both an ignition source and a fuel leak) irrespective of any design specific considerations. This assumption consequently drives installation of AFCB/GFI and subsequent considerations about loss of the AFCB/GFI protection. Airbus consider this AMC paragraph is equivalent to add a new CS 25 requirement to install AFCB/GFI for fuel pumps. This is therefore ‘rulemaking by AC’. Depending on the applications, several failures in the pump design could be necessary to create an ignition source and a fuel leak at the same time. Airbus therefore consider that the EASA should not arbitrarily impose installation of AFCB or GFI but instead rely on the safety assessment of a given overall pump ignition prevention design for compliance. The AC wording of §4.1.3 allows this, since it is describing alternate means of compliance (installation of AFCB/GFI being one). §6.3.11 implies that whatever the pump design is, the applicant should assume a potentially catastrophic single failure at the connector and therefore implement AFCB or GFI with specific reliability/safety requirements in order to mitigate the consequences. This is an unduly severe safety constraints based on arbitrary assumptions.</p>
response	<p data-bbox="379 1361 552 1391">Not accepted.</p> <p data-bbox="379 1397 1394 1496">Paragraph 6.3 provides a list of ‘possible failure modes, but not all the conditions, that should be explored in determining the maximum temperature expected for fuel tank components’.</p> <p data-bbox="379 1503 1394 1713">Item 6.3.11 should therefore be considered, as supported by experience regarding arcing in electrical connectors. This paragraph does not universally mandate the implementation of AFCBs or GFIs. It nevertheless reminds readers that ‘the design of traditional fuel pumps has resulted in the need to install AFCB or GFI protection features to address foreseeable failures and limit the energy release during an arcing event to prevent an ignition source from occurring’.</p> <p data-bbox="379 1720 1394 1818">The experience from in-service aeroplanes has shown the benefits of such mitigation means when the applicant did not anticipate/identify some fuel pump failure modes (refer to A330/A340).</p>
comment	<p data-bbox="379 1883 416 1912">33</p> <p data-bbox="1129 1883 1385 1912" style="text-align: right;">comment by: AIRBUS</p> <p data-bbox="427 1942 1235 1971">1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:</p>

Item 3: Fuel tank and system lightning protection - Amend CS 25.981 – Section 3.1 – AMC 25.981 Appendix A page 73

PROPOSED TEXT / COMMENT

Merge § A.3.4.3 and A.3.4.5 and amend as follows:

Failure of an AFCB or GFI device to detect an arc or ground fault condition in a fuel pump circuit can contribute to a catastrophic fuel tank ignition failure condition. If the loss of arc or ground fault protection is latent, it should therefore be assessed when showing compliance to the CS25.981(a)(3) latent failure provisions. The safety assessment should also analyze common cause failures or design errors that could result in these conditions and verify that appropriate protection to prevent them is provided. Due to the nature of AFCB and GFI devices, special attention should be given to protection from lightning, EMI, and HIRF. The applicant should show by design, analysis, and fault insertion testing, if applicable, the validity of failure analysis assumptions

RATIONALE / REASON for comment: Justification

The proposed § A3.4.3 states that the undetected failure of an AFCB or GFI alone is 'a hazardous failure condition'. Airbus disagrees with this statement since depending on the individual specific designs, several additional failures of pump features could be necessary to potentially create a catastrophic ignition source. It is therefore an undue arbitrary assumption to consider that the failure of an AFCB/GFI to detect an arc or ground fault condition would leave the aircraft only one failure away from a catastrophic fuel tank ignition. Airbus therefore consider that EASA shall not arbitrarily impose safety requirement on the AFCB or GFI design using this assumption but rely instead on the overall pump ignition prevention safety assessment for compliance. The AC wording should allow to adapt safety requirements to the actual applicant design and not unduly prescribe too severe safety constraints based on arbitrary assumptions. Refer also to comment n°3 about AMC §6.3.11.

response

Partially accepted.

The commented section of the proposed AMC includes the assumption of a first condition resulting from a single failure (i.e. arcing at the pump electrical connector, or loss of pump explosion proof features) that, combined with a latent failure (of the protection by AFCB/GFI), could lead to a catastrophic failure condition. In such a scenario, the AFCB/GFI failure condition, considered alone, is hazardous and must be shown to be extremely remote as required by the proposed CS 25.981(a)(3) (latent failure +1 failure criterion). EASA agrees with Airbus that several additional failures of the pump features may be necessary to potentially create a catastrophic ignition source. However, the experience gathered from in-service aeroplanes has shown that such single failures occurred (see also Section A2.1 of the AMC) and continue to occur because the safety analysis failed to anticipate/identify the fuel pump single failure modes. This has been experienced recently, despite the safety assessment methods/technics applied during the last 20 years (e.g. A330/A340). Recent aeroplane certification project experience has also showed that some unexpected failure modes may be encountered during the development phase, in which case the



presence of an AFCB/GFI can be used as an essential feature to allow the justification of corrective actions while allowing the entry into service of the aeroplane (e.g. the A350). Finally, there is very limited benefit from the installation of an unreliable AFCB/GFI while at the same time, some single failure modes exist, but have not been identified. The proposed text is provided as guidelines for the certification of AFCBs/GFIs that EASA recognises as practical and beneficial means for fuel tank ignition prevention. Harmonisation with the FAA approach is also retained. Therefore, Section A.3.4.3 is not changed. However, a clarification is brought to Section A.3.4.5, i.e. the condition 'when combined with a single failure as assumed in Section A.3.4.3' has been added after 'extremely remote (10^{-7} or less)'.

comment

34

comment by: AIRBUS

PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:

Item 3: Fuel tank and system lightning protection - Amend CS 25.981 – Section 3.1 – AMC 25.981 Appendix A page 74

PROPOSED TEXT / COMMENT

§ A.3.6 Built-in test should be reworded as follows:

AFCB and GFI devices should incorporate the built-in test and annunciation features as needed to meet the reliability requirements for showing compliance with CS 25.981(a)(3).

RATIONALE / REASON for comment: Justification

As per the comments n°5 and n°3 the proposed paragraph in the NPA is prescribing reliability requirements and even design solutions (e.g. install multiple protective devices in series or provide built-in tests with annunciation) on the basis of arbitrary/undue assumptions (i.e. failure of an AFCB/GFI to detect an arc or ground fault condition is a hazardous failure condition). The AC wording should allow to adapt safety/design requirements to the actual applicant design and associated safety assessment.

response

Not accepted.

The commented text belongs to an AMC and it therefore does not prescribe requirements. Regarding the consideration of the AFCB/GFI hazardous failure condition, please refer to the response to comment No 33.

comment

35

comment by: AIRBUS

PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:

Item 3: Fuel tank and system lightning protection - Amend CS 25.981 – Section 3.1 – AMC 25.981 Appendix A page 75

PROPOSED TEXT / COMMENT

Amend § 3.10.2 to read:



When AFCB or GFI are installed, the applicant should provide design features to minimize possibility of the inadvertent substitution of an AFCB or GFI with a non-AFCB or GFI device or identify them as CDCCL. In such case the applicant must provide, as practical, visible means of identifying the AFCB or GFI as a CDCCL.

RATIONALE / REASON for comment: Justification

Airbus considers that an AFCB or GFI should be considered as a critical design configuration control limitations (CDCCL) only if they can physically be replaced by non-AFCB/GFI device. The AMC wording should therefore be more open and should prescribe that AFCB/GFI be systematically considered as CDCCL.

response

Not accepted.

The possibility of inadvertent substitution is not the only criterion used for the declaration of an equipment/component as CDCCL (e.g. fuel pumps).

comment

36

comment by: AIRBUS

PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:

Item 3: Fuel tank and system lightning protection –

Amend CS 25.954 Section 3.1 - AMC 25.954 paragraph 5.1.4 page 37

Amend CS 25.981 – Section 3.1 – AMC 25.981 section 7.2.3 page 69, Appendix C, definition C5.5 page 77

PROPOSED TEXT / COMMENT

Revise AMC 25.981 §7.2.3 as follows

7.2.3 Certain CDCCLs apply to elements of fuel system components. As such, maintenance of those critical features may be covered in a CMM. When airworthiness limitations need to call out aspects of CMMs, it is a best practice to limit the CDCCL-controlled content to only those maintenance tasks directly impacting a CDCCL feature, rather than requiring the complete CMM to be a CDCCL. (See the CMM deviation definition in Appendix C of this AMC.)

Revise AMC 25.954 §5.1.4 to read as AMC 25.981 §7.2.3 above

Delete definition C5.5 COMPONENT MAINTENANCE MANUAL (CMM) DEVIATION

RATIONALE / REASON for comment: Justification

Airbus understand it may be useful in a CS 25 AMC to provide best practice for defining CDCCL in CMM. On another hand, Airbus consider that he proposed C5.5 definition is really only pertinent for operators/MRO, hence related to part M/part 145 regulatory material. In addition, in the EASA world, operators/MRO have to comply with the latest revisions of the published ICA. This is a difference with the FAA world which can explain the references included in the FAA AC material about the CMM revisions. Airbus consider these references are not necessary for the EASA part 25 AMC and may be more confusing than useful



response Accepted.

comment 49 comment by: FNAM

AMC25.981(a):

"This AMC provides additional guidance to comply with CS.25.981 (a). It indicates a means of compliance, using circuit protection devices (AFCB / GFI) to provide safety functions that have been accepted by the authorities and therefore complies with point CS.25.981 (a).

Position: Positive impact: this AMC provides a complete and precise means of compliance in order to comply with point CS.25.981 (a). "

Appendix A:

"This annex provides guidelines for the certification of AFCB or GFI devices which have been shown to be practical means of protecting the circuits of electrically driven fuel pumps and other fuel tank components that use electrical power greater than the intrinsic safety.

Position: The FNAM assesses this point with a positive impact since it provides additional assistance in order to certify the AFCB and GFI devices making it possible to comply with point CS.25.981 (a). "

Appendix B:

"This appendix provides a list of documents in order to comply with the regulations in force.

Position: Neutral impact: this list of documents is a support in order to comply with the regulations in force. "

Appendix C:

"Addition of definitions of terms used in AMC 25.954.

Position: Positive impact: additional details to the AMC. "

response Noted.

comment 95 comment by: The Boeing Company

Page: 48

Para: 3.5.2 Maximum surface temperature

THE PROPOSED TEXT STATES:

A surface whose temperature reaches a value 10 °C (50 °F) below the auto-ignition temperature of the fuel air mixture is defined as being at the maximum allowable surface temperature providing a safe margin below the lowest auto-ignition temperature of the fuel. A temperature of 204 °C (400 °F) is accepted as the maximum surface temperature inside fuel tanks for kerosene type fuels without further substantiation.

REQUESTED CHANGE:

A surface whose temperature reaches a *delta* value 28 °C (50 °F) below the auto-ignition temperature of the fuel air mixture is ~~defined~~ *accepted without further substantiation* as ~~being at the maximum allowable surface temperature~~ providing a safe margin below the lowest auto-ignition temperature of the fuel. A temperature of 204 °C (400 °F) is accepted as the maximum surface temperature inside fuel tanks for kerosene type fuels without further substantiation. *Higher maximum surface temperatures may be accepted, provided that it is*



response	<p><i>substantiated that the higher surface temperature will not become an ignition source in the installation.</i></p> <p>JUSTIFICATION: Bring AMC content up to the latest FAA and EASA approved guidance for hot surface ignition which allows for temperatures up to 400F (200C) without substantiation, and temperatures above 400F (200C) with substantiation.</p> <p>Accepted.</p>
comment	<p>99 comment by: <i>The Boeing Company</i></p> <p>Page: 59 and 60 Para: 5.3.6.3 Surface temperatures in areas adjacent to fuel tanks</p> <p><u>THE PROPOSED TEXT STATES:</u></p> <p>5.3.6.3 Surface temperatures in areas adjacent to fuel tanks</p> <p>EASA has approved installations where surfaces adjacent to the tank experience temperatures in excess of the internal fuel tank surface temperature limit. Manufacturers have substantiated that the conditions (ambient pressure, dwell time, fuel type, etc.) within these areas are such that a higher value may be used. For example, applicants have successfully substantiated, for certain pneumatic system installations, a maximum allowable surface temperature of 204 °C (400 °F) with a transient excursion up to 260 °C (500 °F) for a maximum duration of two minutes. The excursion above 204 °C (400 °F) occurs only during failure conditions such as a failure of the engine pneumatic system to regulate the temperature, or a duct rupture. Approval of these elevated temperatures has been based on specific design features, such as an over-temperature shutoff of the pneumatic system so that the surface temperatures adjacent to the tank cannot exceed the surface ignition temperature justified for the fluid type, including the effect of local airflow and ventilation conditions within the zone. The internal tank surface temperatures resulting from the failure should not exceed the surface temperature limit for the fuel type used as described in paragraph 3.5 of this AMC.</p> <p><u>REQUESTED CHANGE:</u> We recommend revising the text as follows:</p> <p>5.3.6.3 Surface temperatures in areas adjacent to fuel tanks</p> <p>EASA has approved installations where surfaces adjacent to the tank experience temperatures in excess of the internal fuel tank surface temperature limit. Manufacturers have substantiated that the conditions (ambient pressure, dwell time, fuel type, etc.) within these areas are such that a higher value may be used. For example, applicants have successfully substantiated, for certain pneumatic system installations, a maximum allowable surface temperature of 204 °C (400 °F)</p>

~~with a transient excursion up to 260 °C (500 °F) for a maximum duration of two minutes. The excursion above 204 °C (400 °F) occurs only during failure conditions such as a failure of the engine pneumatic system to regulate the temperature, or a duct rupture.~~

Maximum Acceptable Surface Temperature for surfaces adjacent to the tank. While it has been generally accepted FAA, JAA [Joint Aviation Authority] and industry practice to use a maximum acceptable surface temperatures of 50° F below the applicable fluid AIT [Auto-Ignition Temperature] (i.e., approximately 400° F/200 °C for jet fuels), somewhat higher temperatures have been accepted in certain cases if substantiated. For example, manufacturers have substantiated that the conditions (ambient pressure, dwell time, fuel type, etc.) within certain flammable fluid leakage zones are such that a higher value may be used. For example, maximum allowable pneumatic bleed duct surface temperatures of 450°F, with a transient excursion up to 500°F for a maximum of two minutes has been approved. The excursion above 450°F occurs only during failure conditions such as an engine pneumatic high stage bleed valve failure or duct rupture. Approval of these elevated temperatures has been based on compensating design features such as cockpit indication of over-temperature and associated procedures to shutoff the overheated system, insulated ducts, zone ventilation airflow which produces a lean fuel to-air mixture, and an automatic over-temperature shutoff of the pneumatic system so that the temperature cannot exceed the accepted 450°F value for more than two minutes.

Recent Boeing certification projects have Issue Papers that allow use of the concepts defined in ARAC draft AC 25.863-1 and the proposed changes use the wording from ARAC draft AC 25.863-1. It is further suggested that AC 25.981-1D also be updated per these proposed changes.

Alternatively, the AC and AMC for 25.981 should remove the wording related to hot surfaces outside and adjacent to the fuel tank and capture these concepts in applicable AC and AMC specific to 25.863. See comment #2 for recommended change and justification.

response Partially accepted.
The proposed change has been implemented, but with a few clarifications.

comment 100 comment by: *The Boeing Company*

Page: 46, 48, 59/60
Para: 3.1.2, 3.5.2 and 5.3.6.3

THE PROPOSED TEXT STATES:

3.1.2 Any components located in or adjacent to a fuel tank must be designed and installed in such a manner that, during both normal and anticipated failure conditions, ignition of flammable fluid vapour will not occur. Compliance with this requirement is typically shown by a combination of component testing and



analysis. Testing of components to meet the appropriate level of explosion-proof....

3.5.2 Maximum surface temperature

A surface whose temperature reaches a value 10 °C (50 °F) below the auto-ignition temperature of the fuel air mixture is defined as being at the maximum allowable surface temperature providing a safe margin below the lowest auto-ignition temperature of the fuel. A temperature of 204 °C (400 °F) is accepted as the maximum surface temperature inside fuel tanks for kerosene type fuels without further substantiation. (Maximum surface temperature considerations for areas outside the fuel tank are discussed in paragraph 5.3.6.3 of this AMC.)

5.3.6.3 Surface temperatures in areas adjacent to fuel tanks

EASA has approved installations where surfaces adjacent to the tank experience temperatures in excess of the internal fuel tank surface temperature limit. Manufacturers have substantiated that the conditions (ambient pressure, dwell time, fuel type, etc.) within these areas are such that a higher value may be used. For example, applicants have successfully substantiated, for certain pneumatic system installations, a maximum allowable surface temperature of 204 °C (400 °F) with a transient excursion up to 260 °C (500 °F) for a maximum duration of two minutes. The excursion above 204 °C (400 °F) occurs only during failure conditions such as a failure of the engine pneumatic system to regulate the temperature, or a duct rupture. Approval of these elevated temperatures has been based on specific design features, such as an over-temperature shutoff of the pneumatic system so that the surface temperatures adjacent to the tank cannot exceed the surface ignition temperature justified for the fluid type, including the effect of local airflow and ventilation conditions within the zone. The internal tank surface temperatures resulting from the failure should not exceed the surface temperature limit for the fuel type used as described in paragraph 3.5 of this AMC.

REQUESTED CHANGE:

We recommend revising the text as follows:

3.1.2 Any components located in ~~or adjacent to~~ a fuel tank must be designed and installed in such a manner that, during both normal and anticipated failure conditions, ignition of flammable fluid vapour will not occur. Compliance with this requirement is typically shown by a combination of component testing and analysis. Testing of components to meet the appropriate level of explosion-proof....

3.5.2 Maximum surface temperature

A surface whose temperature reaches a value 10 °C (50 °F) below the auto-ignition temperature of the fuel air mixture is defined as being at the maximum allowable surface temperature providing a safe margin below the lowest auto-ignition temperature of the fuel. A temperature of 204 °C (400 °F) is accepted as the maximum surface temperature inside fuel tanks for kerosene type fuels



without further substantiation. ~~(Maximum surface temperature considerations for areas outside the fuel tank are discussed in paragraph 5.3.6.3 of this AMC.)~~

~~5.3.6.3 Surface temperatures in areas adjacent to fuel tanks~~

~~EASA has approved installations where surfaces adjacent to the tank experience temperatures in excess of the internal fuel tank surface temperature limit. Manufacturers have substantiated that the conditions (ambient pressure, dwell time, fuel type, etc.) within these areas are such that a higher value may be used. For example, applicants have successfully substantiated, for certain pneumatic system installations, a maximum allowable surface temperature of 204 °C (400 °F) with a transient excursion up to 260 °C (500 °F) for a maximum duration of two minutes. The excursion above 204 °C (400 °F) occurs only during failure conditions such as a failure of the engine pneumatic system to regulate the temperature, or a duct rupture. Approval of these elevated temperatures has been based on specific design features, such as an over-temperature shutoff of the pneumatic system so that the surface temperatures adjacent to the tank cannot exceed the surface ignition temperature justified for the fluid type, including the effect of local airflow and ventilation conditions within the zone. The internal tank surface temperatures resulting from the failure should not exceed the surface temperature limit for the fuel type used as described in paragraph 3.5 of this AMC~~

CS 25.981 and the associated AMC should be applicable only to inside the fuel tanks. CS 25.863 is the regulation governing compliance for flammable leakage zones adjacent to the fuel tanks. For that reason, the proposal should be adopted to incorporate the proposed text in the AMC for 25.863. The FAA should harmonize by revising AC 25.981-1 to remove reference to areas adjacent to fuel tanks and place that guidance in (and publish) AC 25.863-1.

response

Not accepted.

This proposal conflicts with comment 99.

CS 25.863 requires that, in each area where flammable fluids or vapours might escape by leakage of a fluid system, a means is provided to minimise the probability of ignition of the fluids and vapours, and the resultant hazards if ignition does occur. This differs from the intent of CS 25.981, which requires applicants to address the ignition sources that enter a fuel tank, including any source originating from adjacent zones. Adjacent zones to a fuel tank fall under the scope of CS 25.981 for nominal, and possible combinations, of failures leading to the generation of an ignition source in the tank. The specific CS 25.981 criteria (no single failure, no latent (not extremely remote) + one failure, etc.) may impose more design mitigation means than a minimisation objective like the one imposed by CS 25.863.

Appendix J

p. 80

comment

50

comment by: *FNAM*

"Add criteria for ambient lights during an emergency evacuation.



	Position: Positive impact: Normalization of ambient lights. "
response	Noted.

AMC 25.785

p. 80-81

comment	51	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.791

p. 81

comment	52	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.803

p. 81

comment	53	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.807

p. 81

comment	54	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.809

p. 81-82

comment	5	comment by: <i>Michael Bogner, Austro Control GmbH</i>
	<i>Austro Control Panel 11 Team comment:</i>	



	<p>The NPA references the AMC content to CS25.809 (c) and (e). Austro Control Panel 11 considers that the content of this proposed AMC is also covering items of CS25.809 (b)(2) and therefore recommends to also add a reference to (b)(2). The AMC do not explicitly refer any pass/fail criteria. Austro Control Panel 11 team understands that any design change causing a delay in opening the emergency exit compared with the initial emergency evacuation demonstration may require further analysis. Even if this should be covered within other CS25 paragraphs, ACG proposes to include a note for clarification. In addition, CS 25.809 (b) (2) requires that each exit must be openable within 10 seconds. This aspect might still be required to be considered for such demonstrations.</p> <p>A definition of “naïve” subjects, like the proposed definition included in the NPA2020-01 for AMC25.1411(f), should be added (also to be consistent within the AMC). Beside the definition, Austro Control Panel 11 team proposes to include further notes as e.g. that it will be acceptable that the “naïve” subject can study all markings / instructions before start of the demonstration and that the planned cabin briefing should be accomplished accordingly before start of the demonstration. Adding these information could ensure a more standardized way of accomplishing these demonstrations.</p>
response	<p>Partially accepted.</p> <p>EASA agrees with the intent of the comment made by Austrocontrol. EASA has developed the text of the proposed AMC 25.809(c) and (e) taking into account all the items addressed in the comments, and therefore the text of the AMC will not be changed.</p> <p>The proposed AMC clarifies that EASA expects that naïve subject testing is performed in order to demonstrate compliance with CS 25.809(c) and (e). In particular, CS 25.809(e) refers to CS 25.809(b). Based on the new AMC, naïve subject testing needs to be performed to evaluate the designs of emergency exits that are intended to be operated by passengers, while the requirements of CS 25.809(b)(2) apply to every emergency exit.</p> <p>Austrocontrol has suggested to include in AMC 25.809(c) and (e) the definition of a more detailed test protocol, such as the one outlined in the proposed AMC 25.1411(f). EASA prefers to outline the main principles on which the test setup and procedure, as well as the evaluation of the results, should be based, while keeping some margin to select test conditions that may be driven by the consideration of specific critical aspects of the emergency exit design under evaluation.</p> <p>Finally, the proposed AMC clarifies that the tests may be conducted either on the aeroplane or on a representative mock-up, and that the test setup should include all the relevant safety markings and exit opening instructions. The pre-flight briefing delivered to occupants of the exit seat rows does not include any detailed explanation on the instructions for opening the emergency exits, therefore the simulation of the pre-flight briefing is not part of the test procedure.</p>
comment	<p>55 comment by: <i>FNAM</i></p> <p>"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "</p>
response	<p>Noted.</p>

AMC 25.810 p. 82

comment	56	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.811 p. 82

comment	57	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.811(d) p. 82

comment	58	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.812 p. 82

comment	59	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.813 p. 83

comment	60	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.815 p. 83

comment	61	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.819

p. 83

comment	62	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.853

p. 83

comment	63	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC to CS 25.855 and 25.857

p. 84

comment	64	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC to Appendix S, S25.20(b)(2)

p. 84

comment	65	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.562

p. 84

comment	66	comment by: <i>FNAM</i>
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	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "
response	Noted.

AMC to CS 25.793 and CS 25.810(c)

p. 84-85

comment	67	comment by: <i>FNAM</i>
	"This point provides details on the non-slip properties that floor surfaces must comply with. Position: Neutral impact. "	
response	Noted.	

comment	101	comment by: <i>The Boeing Company</i>
	<p>Page:84 Paragraph: 2, bullet 1</p> <p>THE PROPOSED TEXT STATES: - Military Specifications MIL-W-5044B (dated 24 February 1964) and MIL-W-5044C (dated 25 August 1970), titled 'Walkway Compound, Nonslip and Walkway Matting, Nonslip'.</p> <p>REQUESTED CHANGE: Add the following specification to the list - <i>SAE standard AS8993 (dated, TBA), titled 'Coefficient of Friction Test Method for Aircraft Flooring and Walkway Surfaces'</i></p> <p>JUSTIFICATION: SAE created AS8993 as a direct replacement with the intention to supersede the MIL standard which has been canceled for approximately 20 years. When identifying the accepted test specifications, SAE standard AS8993 should be taken into account at the time of updating the AMC guidance. SAE standard AS8993 has just completed the ballot process and is expected to be issued very soon.</p>	
response	<p>Partially accepted.</p> <p>SAE AS8993 was published on 21st April 2020. At the time of publication of the NPA, SAE AS8993 had not been published. EASA has not yet had the opportunity to evaluate and accept the use of this standard in any certification project. The aim of the NPA is to include in the AMC a reference to standards that EASA has evaluated and accepted in projects during the last few years. EASA will consider the possibility to revise the AMC in the future and include a reference to SAE AS8993.</p>	

AMC to CS 25.809(c) and (e)

p. 85



comment	68	comment by: <i>FNAM</i>
	<p>"This point is modified with the addition of tests allowing a simple and fast opening of the emergency exits of an aircraft. Tests will be carried out on a neutral and naive population. Position: Positive impact: improved flight safety in the event of an aircraft incident. "</p>	
response	Noted.	
comment	103	comment by: <i>National Civil Aviation Agency - ANAC Brazil</i>
	<p>The AMC should be more prescriptive in terms of the minimum number of test subjects required to accomplish the test. It also should be more prescriptive in terms of definition of test pass/fail criteria, establishing, for example the percentage of failed tries allowed to consider the test a pass. This percentage would depend eventually on the number of test subjects, i.e. a greater percentage of failure is allowed for a greater number of test subjects, limited to a certain percentage (10 to 15 percent). This is always subject of discussion with the applicants during the test plan evaluation/approval.</p>	
response	<p>Partially accepted. EASA agrees with these considerations. However, the AMC is not intended to provide the detailed definition of a specific test protocol. Please refer to the response to comment No 5.</p>	

AMC 25.810(a)(1)(v)

p. 85-86

comment	13	comment by: <i>Airbus-Regulations-SRg</i>
	<p>Pages 84&85, item 4.6, proposed AMC 25.810(a)(1)(v)</p> <p><u>Airbus request:</u> Please clarify that when mirrored installations (L/H and R/H) can be proven by analysis, only one compatibility test on one side (L/H or R/H) needs to be performed on the aircraft.</p>	
response	<p>Partially accepted. EASA agrees that similarity can be used to reduce the number of escape slide part numbers to be tested to demonstrate compliance with CS 25.810(a)(1)(v). However, EASA does not intend to include in the AMC detailed guidance on how to demonstrate the similarity between different escape slide part numbers, for example, criteria that should be met to consider two escape slide part numbers as 'mirrored installations'.</p>	
comment	69	comment by: <i>FNAM</i>
	<p>"Add this point to indicate that at least one deployment and inflation test should be performed on the aircraft, in accordance with previous EASA certification projects.</p>	



response	Position: Positive impact on flight safety. "
	Noted.

AMC 25.1411(f)	p. 86-87
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comment	6	comment by: <i>Michael Bogner, Austro Control GmbH</i>
	Austro Control Panel 11 Team comment:	
	<p>The in the AMC proposed wording “It does not include the time for the occupant to return to the upright position, to remove a pull strap from the preserver (if used) or to open the preserver package provided by the preserver manufacturer.” might be adapted to avoid confusions. Austro Control Panel 11 team either asks for clarification about what is the mentioned pull strap (strap of life vest or the strap attached to a life vest container) or proposes to completely remove the sentence as the before given definition of the end of the test is considered to be well defined (“end with the occupant having the preserver in their hand(s) and fully removed from the stowage container”). Alternatively, it might be added that no further actions/tasks despite having the preserver in hand and fully removed should be accounted within the test time.</p>	
response	<p>Not accepted. Certain life preservers can be removed from their packaging by pulling a strap attached to the life preserver. The text of the AMC is harmonised with ETSO C127b, and is considered sufficiently clear on how to determine the time necessary to retrieve the life preserver.</p>	

comment	70	comment by: <i>FNAM</i>
	<p>"This new point is proposed and it is intended to ensure that the storage of lifejackets, which are not part of a seat system conforming to ETSO-C127b, will be certified according to the same standard with regard to the range and the recovery of life jacket. Position: Positive impact on flight safety. "</p>	
response	Noted.	

comment	102	comment by: <i>The Boeing Company</i>
	<p>Page:85 Paragraph: <i>AMC 25.1411(f)</i></p> <p>THE PROPOSED TEXT STATES:</p> <p>Life preserver stowage provisions</p> <p>The applicant should demonstrate that the life preserver is within easy reach of, and can be readily removed by, a seated and belted occupant (shoulder strap(s) may be removed prior to demonstration), for all seat orientations and</p>	



installations that are intended for use during taxi, take-off and landing. In lieu of an actual life preserver, a representative object (e.g. of the same size and weight) may be utilised for testing. The evaluation to quickly retrieve the preserver is to begin with the occupant moving their hand(s) from the seated position to reach for the preserver and to end with the occupant having the preserver in their hand(s) and fully removed from the stowage container. It does not include the time for the occupant to return to the upright position, to remove a pull strap from the preserver (if used) or to open the preserver package provided by the preserver manufacturer.

The applicant should test the critical configuration(s) to demonstrate retrieval of the life preserver in less than 10 seconds by a minimum of 5 test subjects with a success rate of no less than 75 %. The test should evaluate three anticipated occupant test subject size categories: the 5th, 50th and 95th percentile. At least one occupant from each size category should demonstrate successful retrieval within 10 seconds. No more than 40 % of the overall test subject population should be in the 5th or 95th percentile occupant categories.

1) For passenger seats, the test subjects should be naïve. For the purpose of this test, naïve test subjects should be defined as follows: they should have had no experience within the prior 24 months in retrieving a life preserver. The subjects should receive no retrieval information other than a typical preflight briefing. The occupant size categories to be evaluated should be defined as:

- a. A 5th percentile occupant is no taller than 1.5 m (60 in).
- b. A 50th percentile occupant is at least 1.6 m (63 in) tall but no taller than 1.8 m (70 in).
- c. A 95th percentile occupant weighs at least 110.7 kg (244 lb).

2) For flight attendant and observer seats, the test subjects do not need to be naïve. The occupant size categories to be evaluated should be defined as:

- a. A 5th percentile occupant is no taller than 1.5 m (60 in).
- b. A 50th percentile occupant is at least 1.6 m (63 in) tall but no taller than 1.8 m (70 in.).
- c. A 95th percentile occupant weighs at least 110.7 kg (244 lb).

3) For pilot/co-pilot seats, the test subjects do not need to be naïve. The occupant size categories to be evaluated should be defined as:

- a. A 5th percentile occupant is no taller than 1.57 m (62 in).
- b. A 50th percentile occupant is at least 1.6m (63 in) tall but no taller than 1.8 m (70 in.).
- c. A 95th percentile occupant weighs at least 110.7 kg (244 lb).

REQUESTED CHANGE:

Add a paragraph directly following the above text:

“If the naïve subject testing has been conducted as part of an ETSO approval, the data is considered valid. If the life vest container is installed on a product that

does not have an ETSO approval covering life vest retrieval by naïve subject testing (such as non-ETSO furniture or ETSO-C127a seats), the naïve subject testing may be conducted in parallel with the seat ETSO processes but cannot be approved under the ETSO authorization. If the testing is done in parallel with an ETSO approval, we will accept statements made by the seat ETSO approval holder regarding the pass/fail criteria pertaining to the naïve subject testing of life vest retrieval.”

JUSTIFICATION:

The proposed AMC adopts the ETSO requirements for lifevest retrieval for locations that are not approved by ETSO. Typically, these locations would be on seat furniture and under the design oversight of the ETSO seat supplier, even though they may not be the manufacturer. However, as the furniture is non-ETSO (and therefore part of the OEM’s Type Certificate) the OEM would be responsible for arranging and witnessing the naïve subject tests.

In order for this not to be burdensome, requiring witnesses to travel around the world, and still obtain data that is useful in ensuring life vest retrievability, adding the above text permits the ETSO holder to conduct life vest retrieval testing in parallel with the ETSO process. Naturally, the ETSO could not approve the data, but the ETSO holder’s statement could be accepted by EASA and the data acknowledged as valid (for example, by using the Declaration of Design and Performance (DDP) or Installation Instructions and Limitations (IIL) approved under the ETSO). This is similar to the methodology defined by the FAA in Policy statement ANM-03-115-31 for the collection of data used by the OEM to show compliance to 14CFR 25.785 (b) and (d).

response

Not accepted.

The change proposed by the commentator is outside the scope of the airworthiness specifications issued by EASA. The requirements applicable to the installation of equipment, with or without an ETSO Approval (ETSOA), are included in EASA Part 21 and in the related AMC and GM.

comment

104

comment by: *National Civil Aviation Agency - ANAC Brazil*

The gender of the occupant size categories are not specified. There should also be specification of gender percentage of the "into the range" test subjects. The standard definition of occupant size categories is not specified (American, European, etc..)

response

Not accepted.

The text of the AMC is harmonised with ETSO C127b and it is considered adequate to evaluate the retrieval of life preservers. The criteria for the selection of the test subjects do not have the objective of generating a test group that is fully representative of the flying public. The genders and the ages of the subjects are deemed to have negligible impact on the outcome of the evaluation.

comment	14	comment by: <i>Airbus-Regulations-SRg</i>
	Page 86, Item 4.8, proposed AMC 25.810	
	<p><u>Airbus Comment:</u> Although this specific combination of different environmental conditions can be understood from a safety standpoint Airbus does not agree to combine different environmental conditions within this AMC as it would modify the initial Certification Specification. Instead, CS 25.810 should be adapted accordingly.</p> <p><u>Airbus request:</u> The combination of different environmental conditions for the event of an emergency evacuation should be subject to a dedicated risk analysis in order to validate the associated additional cost for the necessary additional qualification for future applications.</p>	
response	Not accepted. The proposed AMC specifies wind conditions which are already required in CS 25.810. The other condition to be taken into account is the effect of cold temperatures during flight; the AMC (and the CS) does not specify figures for the cold temperature, which is to be evaluated by the applicant depending on the flight profiles envisaged for the aeroplane type at stake.	
comment	71	comment by: <i>FNAM</i>
	"This point provides compliance criteria for exhaust systems installed in non-pressurized compartments. Position: Positive impact on flight safety. "	
response	Noted.	

AMC 25.810(c)(2)

p. 87

comment	72	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.1581

p. 87-88

comment	24	comment by: <i>AIRBUS</i>
	1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1581 Appendix 1, paragraph 6.a(1)	



	<p>2. PROPOSED TEXT / COMMENT: AI disagree with the proposed amendment and suggest to come back to the original wording. Link to the CS 25.1309 could be replaced by a link to AMC 25.1309 definitions</p> <p>3. RATIONALE / REASON / JUSTIFICATION for the Comment: It is important to keep in this parag 6 overall guidelines for integrity target of the computerized AFM, on top of the other guidelines developed in this appendix. Indeed this ensures fair consistency of design targets between the various applicants for such a basic and shared topic of CS25. With the NPA proposal, this consistency might disappear, as more subject to interpretation about what the "assessment" could be. As stated in the Summary part of the NPA, with current Appendix1 parag 6.a(1) wording, this overall objective is inferred from this statement which is also fully consistent with FAA AC 25.1581-1: Quote: The computation of hazardously misleading primary information such as take-off speeds, landing approach speeds, engine thrust or power, engine limit data or other related aeroplane performance data, should be improbable (as defined in CS 25.1309) Unquote In this sentence "CS 25.1309" might be replaced by "AMC 25.1309" and "improbable" might be completed by a parenthesis "(remote or extremely remote, as defined in AMC 25.1309)" consistently with what was in AMJ 25.1309.</p>
response	<p>Not accepted. This option is not considered adequate, as it does not solve the ambiguity that exists with the current text using the term 'improbable'. For installed electronic AFMs, this would raise the question of the identification of the applicable failure condition classification and probability per AMC 25.1309 (i.e. remote or extremely remote). Furthermore, as an electronic AFM may not be installed in the aeroplane, the only reference to AMC 25.1309 is not adequate. As mentioned in the NPA, the safety analysis will help in defining an integrity level and architecture (taking into consideration potential prevention and mitigation means) commensurate with the actual severity of the failure condition. It also provides some flexibility to applicants to propose adequate means of compliance taking into account the variability of the systems that may be used as electronic AFMs (ground stations, tablets, etc).</p>
comment	<p>73 comment by: <i>FNAM</i></p> <p>"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "</p>
response	<p>Noted.</p>

AMC 25.1	p. 88
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comment	74 comment by: <i>FNAM</i>
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	"This point provides recognition of the EUROCAE ED-263 document as an acceptable standard to be used when demonstrating the compliance of an OBWBS with the applicable certification specifications. Position: Positive impact on flight safety. "
response	Noted.
comment	108 comment by: <i>National Civil Aviation Agency - ANAC Brazil</i> There are other documents discussing OBWBS such as FAA AC 20-161 and SAE ARP 1409C. It would be important to know if EASA accepts these other documents as alternatives to EUROCAE ED-263.
response	Noted. FAA AC 20-161 is referenced in several paragraphs of ED-263. SAE ARP 1409C is also referenced in ED-263, in the list of industry documents

AMC 25.831(a)

p. 88-89

comment	28 comment by: <i>DGAC France</i> In order to avoid ambiguity and further interpretation, it could be useful to precise the level of alerting required, according to CS25.1322. Our understanding is that a Caution alert would be required, since the air conditioning status is not changing: already 'off', and already indicated as such to the crew on a system display or control panel. Therefore, an Advisory only would not meet the intent of positively reminding the crew (with their acknowledgment) of the deactivated status of the air conditioning.
response	Not accepted. CS 25.1322 indeed applies, and EASA prefers not to prescribe the outcome of its application to this alert.
comment	75 comment by: <i>FNAM</i> "This point is modified to clarify that an alert must be triggered if the air conditioning system is still" turned off "after the authorized limited operating period, the air conditioning is turned off. Position: Positive impact on flight safety. "
response	Noted.
comment	85 comment by: <i>MITSUBISHI AIRCRAFT CORPORATION</i> [Page, Chapter] Page 88 of 98, Item 8 _ 8.1.2.1 Autopilot Disengagement Alerts [Comment] Several references to the certification requirement indicate "see CS 25.1329(j).



response	<p>[Reason for Change] Minor wording improvement: Advisory material, particularly where it is already paraphrasing the original requirement only need to reference the requirement (CS 25.1329(j)).</p> <p>[Change Proposal] from: "(see CS 25.1329(j))" to: "(CS 25.1329(j))"</p> <p>Not accepted. For editorial consistency with other paragraphs of this AMC, the proposed change is not made.</p>
comment	<p>105 comment by: <i>National Civil Aviation Agency - ANAC Brazil</i></p> <p>ANAC acknowledges that the proposed change aims to enhance safety by requesting an alert. However, we believe that the AMC could be less prescriptive and more performance based. We propose something like "the design should be such that the probability of the air conditioning remaining off after a certain time limit is minimized". This minimization could then be achieved by means of an alert but also by means of system automatims or even an AFM procedure (after takeoff checklist, for example, as per AC 25-22).</p>
response	<p>Not accepted. The condition for a need to alert the flight crew is that the system is 'off' after the maximum allowed time period. If this condition cannot exist because the system design prevents this condition happening, then there is no need for an alert. But this does not contradict the AMC. An AFM procedure would not be acceptable as a means to prevent the above condition.</p>
comment	<p>109 comment by: <i>Bombardier Aerospace</i></p> <p>BA comment: The proposed rule should be clarified to specify that the alert is applicable to the flight condition only. Also, air conditioning system in the "off" position means that the air conditioning system is in the off position and any alternate backup system will not be operative (e.g., RAM air ventilation system, Auxiliary pressurization system, etc.). Also, the addition of an alert should not be done through an AMC but rather by an update of the CS 25.831 rule.</p> <p>BA proposal:</p> <ol style="list-style-type: none"> 1. Update CS 25.831 rule to cover the additional alert; 2. Amend the proposed AMC as follows: Item 7: Air conditioning system It is proposed to amend AMC 25.831(a) to clarify that an alert should be triggered if in flight, the air conditioning system including backup system is still 'off' after the allowed limited time period of operation with air conditioning selected 'off'. AMC 25.831(a) Ventilation

	<p>(...)</p> <p>3. Operations with the air conditioning system 'off'</p> <p>The following provisions should be considered for the limited time periods, such as during take-off, during which the air conditioning system is 'off' in flight:</p> <p>a. There should be a means to annunciate to the flight crew that the air conditioning system and associated backup system (e.g., RAM air ventilation system, Auxiliary ventilation system, etc.) are is selected to 'off'. If in flight, after the end of the maximum allowed time period (e.g., typically after the take-off), the air conditioning system is still in the 'off' position, an alert should be triggered to inform the flight crew of the status of the air conditioning system.</p> <p>(...)</p>
response	<p>Item 1: Not accepted. This NPA proposes clarification of already existing AMC text. Furthermore, it does not create any new requirements, but only clarifies how to ensure compliance with CS 25.831(a) under a specific condition.</p> <p>Item 2: Partially Accepted. Only the condition 'in flight' is added to the AMC paragraph 3. as proposed. The term 'air conditioning system' is used in the AMC as a generic term to designate the means used to provide conditioned air to the cabin.</p>

AMC N°1 to CS 25.1329

p. 89-90

comment	<p>76</p> <p>comment by: <i>FNAM</i></p> <p>"This point is modified in order to provide more precise criteria on the audible and visual indicators necessary for the engagement and disengagement of the automatic pilot.</p> <p>Position: Positive impact on flight safety. "</p>
response	Noted.
comment	<p>87</p> <p>comment by: <i>MITSUBISHI AIRCRAFT CORPORATION</i></p> <p>[Page, Chapter] Page 89 of 98, Item 8 _ 8.4.1 Autopilot _ a)</p> <p>[Comment] Although the concern is that abrupt flight crew release of the force could result in a hazard, the release itself is not a hazard.</p> <p>[Reason for Change] Minor wording improvement</p> <p>[Change Proposal] from: "a) Sustained application of an override force should not result in a potential hazard, such as when the flight crew abruptly releases the force on the controls." to: "a) A potential hazard should not result from sustained application of an override force, nor by the flight crew abruptly releasing the force on the controls."</p>
response	Partially accepted.



The comment is understood and the sentence has been clarified, although not exactly as suggested by the comment. Also, the case of manual disengagement of the autopilot is added.

AMC 25-11

p. 90-91

comment

27

comment by: AIRBUS

1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO:
AMC 25.11

2. COMMENT

It should be clarified that this AMC 25-11 (chapter 5 - 31e(4)(b)) amendment is limited to main Primary Flight Display (PFD) as per item 9 "*Primary flight displays during unusual attitude and declutter modes*" of the NPA 2020-01. It is to be noted for HUD that, in case of excessive attitudes, the procedure is to revert to (head-down) PFD with associated message "REVERT TO PFD" displayed on HUD.

23 PROPOSAL

(b) To enhance pilot performance a means should be considered to declutter the display. For example, an attitude indicator may automatically declutter when the aeroplane is at an unusual attitude to aid the pilot in recovery from the unusual attitude by removing unnecessary information and retaining information required for the flight crew to recover the aeroplane. Failure messages, flags, or comparative monitoring alerts related to the information required by CS 25.1303 should not be removed from the main Primary Flight Display by decluttering the display.

response

Accepted.

comment

77

comment by: FNAME

"This point is modified so that information linked to error messages and alert messages is no longer deleted on the EFDs.
Position: Positive impact on flight safety. "

response

Noted.

comment

86

comment by: MITSUBISHI AIRCRAFT CORPORATION

[Page, Chapter]

Page 90 of 98, Item 9 _ AMC 25-11 _ (4) Clutter and deClutter _ (b)

[Comment]

The generic nature of the wording of 31.e(4)(b) seems to be too limiting on what should not be decluttered – eg. a heading comparator alert should be able to be decluttered in an unusual attitude scenario.



	<p>[Reason for Change] The intent is to declutter to assist the pilot, especially in an unusual attitude situation – trying to be too generic and leaving anything related to CS 25.1303 limits the declutter benefit.</p> <p>[Change Proposal] from: “Failure messages, flags, or comparative monitoring alerts related to the information required by CS 25.1303 should not be removed by decluttering the display.” to: “For an unusual attitude, only Failure messages, flags, or comparative monitoring alerts related to the information required by CS 25.1303(b)5) should not be removed by decluttering the display.”</p>
response	<p>Partially accepted. The decluttering of the primary display, in the case of unusual attitude, is provided as one example. Therefore, limiting the applicability of the sentence to this case only could be misleading. Nevertheless, it is recognised that in case of unusual attitude, it is not necessary to display a heading comparator alert if the heading information is not displayed. Based on the fact that the design of any declutter mode will have to consider the specific scenarios, e.g. failures, in the presence of which the declutter is triggered, and that the removal of some information required by CS 25.1303 will have to be justified, the removal of an alert could be acceptable if the associated information is not displayed. The proposed new text has therefore been revised to specify this point.</p>
comment	<p>88 comment by: <i>MITSUBISHI AIRCRAFT CORPORATION</i></p> <p>[Page, Chapter] Page 90 of 98, Item 9 _ AMC 25-11 _ (4) Clutter and deClutter _ (b)</p> <p>[Comment] Indicating that "Failure messages, flags, or comparative monitoring alerts related to the information .." should not be decluttered provides little guidance - should failure messages not be decluttered, or perhaps flags.</p> <p>[Reason for Change] Minor wording improvement: The wording from the original safety recommendation provides better advisory guidance: "pertinent cautions are not removed during unusual attitude or declutter modes".</p> <p>[Change Proposal] from: “Failure messages, flags, or comparative monitoring alerts related to the information...” to: “Pertinent failure messages, flags, and comparative monitoring alerts related to the information...”</p>
response	<p>Partially accepted. The objective of using the word ‘pertinent’ is understood and agreed. Nevertheless, it may not be sufficient to clarify the sentence. Instead, the sentence has been revised to specify that the recommendation not to remove failure messages, flags, or comparative monitoring alerts apply as long as the</p>

related information (required by CS 25.1303) is provided on the primary flight display.

AMC 25.581

p. 91-93

comment	78	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.899

p. 93

comment	15	comment by: <i>AIRBUS</i>
	<p>1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.899 industry standards</p> <p>2. PROPOSED TEXT / COMMENT: Suggested change replace "The following documents may be used when showing compliance with CS 25.581" by The following documents may be used when showing compliance with CS 25.899"</p> <p>3. RATIONALE / REASON for comment: Justification it seems that typo errors should be removed.</p>	
response	Accepted.	
comment	79	comment by: <i>FNAM</i>
	"Amendment of points: Terminology and documentary correction. Position: Neutral impact. "	
response	Noted.	

AMC 25.1351(d)

p. 93-94

comment	16	comment by: <i>AIRBUS</i>
	<p>1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1351(d)</p> <p>2. PROPOSED TEXT / COMMENT: Suggested change 6 Alternate Power Source Duration and Integrity 6.1 Time Limited.</p> <p>3. RATIONALE / REASON for comment: Justification</p>	



response	<p>Not clear if the change applies to § 6.1 or to 6.2. It is assumed that it is 6.1.</p> <p>Not accepted. The proposed new sub-paragraph (e) is at the end of paragraph '6.2 <i>Non-Time Limited</i>'.</p>
comment	<p>17 comment by: AIRBUS</p> <p>1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1351 (d)"e" first "-"</p> <p>2. PROPOSED TEXT / COMMENT: Suggested change replace the text "It must be shown that following the loss of normal electrical power ..." by "It should be shown that when the non-time-limited power source(s) is(are) not providing electrical power ..."</p> <p>3. RATIONALE / REASON for comment: Justification Harmonizing of text with the introduction to bullet "e". Change "must" by "should" as it is in the AMC part</p>
response	<p>Partially accepted. 'Must' is replaced by 'should' as proposed. A clarification is also brought to the sentence as intended by the comment, but with a slightly different wording.</p>
comment	<p>18 comment by: AIRBUS</p> <p>1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1351 (d)"e" second "-"</p> <p>2. PROPOSED TEXT / COMMENT: Suggested change replace the text "between the loss of normal electrical power and the alternate electrical power source being operational" by "between the loss of normal electrical power and the non-time-limited alternate electrical power source being operational"</p> <p>3. RATIONALE / REASON for comment: Justification harmonizing of text with the introduction to bullet "e"</p>
response	<p>Accepted.</p>
comment	<p>19 comment by: AIRBUS</p> <p>1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1351 (d)"e" third "-"</p> <p>2. PROPOSED TEXT / COMMENT: Suggested change replace "Loss of normal electrical power is usually associated" by "Loss of non-time-limited electrical power is usually associated"</p> <p>3. RATIONALE / REASON for comment: Justification harmonizing of text with the introduction to bullet "e"</p>

response	Not accepted. There is a confusion between 'normal electrical power source' and 'non-time limited <u>alternate</u> electrical power source'.
comment	20 comment by: AIRBUS 1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1351 (d)"e" third "-" 2. PROPOSED TEXT / COMMENT: Suggested change replace "Any battery located near this power centre will have to be considered as part of the normal electrical power generating" by "Any battery located near this power centre should have to be considered as part of the normal electrical power generating" 3. RATIONALE / REASON for comment: Justification the use of "should" instead of "will" in an AMC
response	Accepted.
comment	21 comment by: AIRBUS 1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1351 (d)"e" fifth "-" 2. PROPOSED TEXT / COMMENT: Suggested change delete this redundant sub-paragraph 3. RATIONALE / REASON for comment: Justification Section 6.1(b) of this AMC 25.1351(d) unambiguously covers the intent therefore where is the need to recall it at this stage?
response	Not accepted. As the scope of 6.1 (time-limited) is different from that of 6.2 (non-time limited), it is deemed useful to make the link with the proposed reference. This avoids repeating the same provision in 6.2.
comment	22 comment by: AIRBUS 1. PAGE / PARAGRAPH / SECTION THE COMMENT IS RELATED TO: AMC 25.1351 (d)"e" six "-" 2. PROPOSED TEXT / COMMENT: Suggested change replace "required minimum duration should be demonstrated by actual testing" by "required minimum duration should be demonstrated by actual testing or demonstrated equivalent means" 3. RATIONALE / REASON for comment: Justification the AMC should leave the industry to provide an adequate means of compliance
response	Accepted.



comment	80	comment by: <i>FNAM</i>
	<p>"This point is modified in paragraph e) in order to provide criteria on the back-up batteries allowing the aircraft to have a source of electrical energy in the event of breakdowns. Position: Positive impact on flight safety. "</p>	
response	Noted.	

6. References

p. 97

comment	83	comment by: <i>Gulfstream Aerospace Corporation</i>				
	<table border="1"> <thead> <tr> <th>Section/Page</th> <th>Comment</th> </tr> </thead> <tbody> <tr> <td>6.3, pg 96, Other reference documents</td> <td> <p>The FTHWG Topic 18 Final Report is in response to Phase 3 tasking rather than Phase 2.</p> <p>Suggest that EASA reference the FTWHG Topic 18 Go-Around Handling Qualities & Performance Recommendation Report, dated December 2018.</p> </td> </tr> </tbody> </table>		Section/Page	Comment	6.3, pg 96, Other reference documents	<p>The FTHWG Topic 18 Final Report is in response to Phase 3 tasking rather than Phase 2.</p> <p>Suggest that EASA reference the FTWHG Topic 18 Go-Around Handling Qualities & Performance Recommendation Report, dated December 2018.</p>
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response	<p>Noted. Thank you for this comment. But please note that this chapter of the NPA will not be re-published.</p>					

