



European Aviation Safety Agency  
**Comment-Response Document 2017-13**

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Appendix  
to ED Decision 2018/006/R

RELATED NPA: 2017-13 — RMT.0196 — 3.5.2018

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## 1. Summary of the outcome of the consultation

Despite the fact that NPA 2017-13 included three different elements, this CRD contains only responses to comments on CS-FSTD(A) Book 1 and Book 2, which have been individually addressed.

The comments referring to Part-ARA, i.e. 'inspector competency framework', shall be addressed in the context of another decision, which is planned to be published soon.

The comments referring to Part-FCL, i.e. 'training matrix', shall be addressed after the focused consultation that took place on 6 March 2018 in the context of a new rulemaking task (RMT).

A great number of comments referred to the tests, new tests and changes to existing tests. The overarching goal of harmonisation with the FAA has been decisive in deciding whether or not to accept certain comments. Thus, comments suggesting a deviation from FAA Part 60 Change 2 have not been accepted.

On the other hand, numerous comments pointed out differences between CS-FSTD(A) and FAA Part 60, for instance, in the table of FSTD validation tests for the engine and airframe icing effects; the tolerances have been removed to ensure alignment with FAA Part 60 Change 2.

A few comments were related to the use of training devices, which have not been accepted as they are outside the scope of CS-FSTD(A).

Finally, the comments requesting further clarification or adding references have been generally accepted.



## 2. Individual comments and responses

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

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

### (General comments)

comment	172	comment by: <i>EUROCONTROL</i>
	The EUROCONTROL Agency welcomes the publication of EASA Notice of Proposed Amendment 2017-13. It also thanks EASA for the opportunity that has been given to submit comments. However, despite the fact that the EUROCONTROL Agency has no comments to make, it will read the future CRD with interest.	
response	Noted.	

### EXECUTIVE SUMMARY

p. 1

comment	5	comment by: <i>French civil aviation authority</i>
	Please be advised that French DGAC has no comments on this NPA. On behalf of Bruno Haller / Bertrand Huron.	
response	Noted.	
comment	184	comment by: <i>CAE Inc.</i>
	Given that NPA 2017-013 requirements are in support of the EASA Opinion 06/2017 which has a compliance date of 8 April 2019 (taking into account the transition period), we expect that the same date of 8 April 2019 will be considered as the compliance date for the update of the simulators. CAE would like to highlight that the period from the entry into force and the compliance date may not provide operators adequate time to comply, due to following key considerations:	
	- Some of the updates are highly dependant on OEM data, and whilst many platforms may have been addressed as a result of the FAA Part-60 Change 2 regulation, some OEMs are still lagging in developing and providing the necessary data to support the updates required	



under this NPA. Furthermore, it should be noted that the FAA regulation was limited to Part 121 air carriers and as such did not extend to all aircraft types whereas the EASA regulation applies to all operators.

- Training Device Manufacturers (TDM) can only finalize solutions after receipt of the necessary data and this requires additional time.
- Operators have to go through the normal ordering process and the related contracts, and this also can add a few months to the overall time.
- TDMs are updating simulators that are already in service and operators have to re-schedule their training to provide the necessary down time required to support the updates.
- Operators have to schedule their competent authority to complete the necessary evaluations. These updates will put tremendous demands for evaluations, and the agency and other member states already have resource issues.
- Notwithstanding the above points, instructors will need to be scheduled for their training well prior to the compliance date.

Accordingly, CAE recommends the agency consider including provisions to extend the compliance dates for operators who are unable to comply in a timely manner and have demonstrated that they have exhausted all available means to achieve compliance.

response

Noted.

## 2. In summary — why and what | 2.1. Why we need to change the rules — issue/rationale

p. 4-8

comment

178

comment by: *International Development of Technology b.v.*

The statement made by EASA that it is "not realistic to train for "unexpected" or "sudden" stalls could be misleading:

- Stalls are usually not an expected event to begin with. Do we suggest then that these events not be trained?
- The skills applied to "stall event" training also apply to stall recovery; namely:
  - recognition/confirmation/communication of the stall event
  - reduction of AoA
  - recovery through the use of appropriate control inputs
- Regardless of the aircraft type, industry consensus is to reduce AoA first, in exchange of potential energy (altitude)
- Some aircraft will exhibit a tendency to roll off, tempting the pilot to first counter the roll. The correct action is still "reduce AoA".
- EASA has chosen to require operators conducting full-stall recovery training to comply with the stall model requirements (in case they do include that limited yet critical portion of that training).

Hence, the statement "not realistic" is perhaps misleading and could be reconsidered.

response

Not accepted.

EASA has sent this reply to the Russian authority in the context of the safety



recommendation received ('simulate an unexpected or sudden aircraft stall').

To reach this conclusion, EASA consulted this recommendation with the pool of flight training experts, a pool that was established in the context of RMT.0581 on 'Loss of control prevention and recovery training'. The group advised that this sudden stall situation does not match the stall prevention objective which aims to recognise the indicators of an incipient stall and develop appropriate skills to recover from it. EASA highlighted in its Opinion No 06/2017 that approach-to-stall exercises should be delivered as manoeuvre-based exercises led by the instructor, rather than scenario-based, to avoid negative transfer of training. The possibility is kept to train to full-stall recovery. However, starting abruptly in a stall situation is not realistic and not supported.

**2. In summary — why and what | 2.2. What we want to achieve — objectives** p. 9-10

comment 93 comment by: Dick Verburg

UPRT should be trained through ALL levels of flight training, so why restrict UPRT to FFS devices only. There is no reason why a type specific FTD2 (or even FTD1 with all functions) could or should not be required to have the UPRT solutions from this NPA included.

response

Noted.

Agreed on the principle — this is captured in the following:

a) to ensure that FSTDs better facilitate current and future training needs by establishing the necessary simulation fidelity levels required to support training tasks;

and

f) to align CS-FSTD(A) with the outcome of RMT.0581 'Loss of control prevention and recovery training'.

As mentioned already, nothing restricts to FFS devices only, except when explicitly stated in Part-ORO or Part-FCL, or identified as a limitation of the FSTD.

EASA Opinion No 06/2017 states:

'An FFS can be used by the ATO to either train recovery from a stall or demonstrate the type-specific characteristics of a stall, or both, provided that:

(a) the FFS has been qualified in accordance with the special evaluation requirements in CS-FSTD(A); and

(b) the ATO has successfully demonstrated to the competent authority that any negative transfer of training is mitigated.'

comment 119 comment by: FAA

11	2.3.1	Concerning the phrase "as well as to demonstrate to the competent authority (CA) how the ATO mitigates any potential negative transfer of training", why is this raised specifically for post-stall training tasks in a simulator? First,	First, it is suggested that negative transfer of training concerns be raised at a general level, rather than at a specific level for one task such as post-stall training. Second, EASA should state whether negative transfer of
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	<p>mitigating negative transfer of training should be proferred as a general precept that applies to all simulator training. Second, these concerns were raised via comments on NPA 2015-13 and appear not to have been validated. To the FAA's knowledge, such concerns are hypotheses and have not been supported with substantiating evidence. Did the RMT.0196 validate the concerns or treat them as axiomatic? If these simulator concerns have been validated, then how will negative transfer of training be mitigated for full stall training conducted in flight under the advanced UPRT course FCL.745.A? For example, will the stall warning systems in flight be disabled for the stall exercises?</p>	<p>training concerns raised in comments were validated with supporting evidence or accepted at face value. Third, EASA should explain the apparent logical inconsistency between the hypothesized negative transfer of training concerns for post-stall tasks in a simulator and the lack of such concerns in the advanced UPRT course FCL.745.A.</p>
<p>response</p>	<p>Noted.</p> <p>This concern stems from EASA Opinion No 06/2017 on 'Loss of control prevention and recovery training'. By using the term 'stall event', training providers may decide, in addition to the mandatory approach to stall exercise, to deliver stall exercises on the basis of a careful evaluation in consultation with the competent authority to ensure that negative transfer of training is avoided.</p> <p>The justification is based on RMT.0581 work (EASA Opinion No 06/2017 — published following the NPA public consultation process).</p>	

**2. In summary — why and what | 2.3. How we want to achieve it — overview of the proposals** p. 10-13

<p>comment</p>	<p>155 <span style="float: right;">comment by: <i>Flight Simulation Company FSC</i></span></p> <p><b><u>Page 11, 2.3.1 UPRT</u></b></p> <p><b>Comment/proposed text:</b> The word FFS should be replaced by FSTD.</p>	
<p>response</p>	<p>Accepted.</p> <p>Changed to ensure consistency.</p>	



<b>3. Proposed amendments and rationale in detail   3.1. Draft certification specifications (Draft EASA decision)   3.1.1. CS-FSTD(A) — Book 1</b>	p. 15-32
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comment	<p style="text-align: right;">17 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 18</p> <p><b>Paragraph No:</b> Appendix 1 to CS FSTD(A).300 – Row 1.d.3</p> <p><b>Comment:</b> There is no applicability on FNPT II or MCC for instrument indications responding appropriately to icing effects.</p> <p><b>Justification:</b> , Row 2.t.2 on page 29 states that modelling that includes the effects of airframe and engine icing applies to FNPT II and MCC. This appears to be inconsistent with Row 1.d.3 on page 18.</p> <p><b>Proposed Text:</b> Add FNPT II and MCC applicability to Row 1.d.3 on page 18.</p>
response	Accepted.
comment	<p style="text-align: right;">18 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 18, 27, 28 &amp; 74</p> <p><b>Paragraph No:</b> Appendix 1 to CS FSTD(A).300 –Rows 1.d.3, 1.s.2, 1.t.1 and GM1 Appendix 9 to Part-FCL</p> <p><b>Comment:</b> If a level B FFS is considered suitable for training, testing and checking licensing and OPs items, it is not understood why it should not be capable to demonstrate icing effects and flaps up stalling characteristics.</p> <p><b>Justification:</b> GM1 Appendix 9 to Part-FCL (on page 74) shows level B FFS can support Type Rating Courses for SP and MP. It is questioned therefore, why does Appendix 1 to CS FSTD(A).300 state that a level B FFS is not suitable to support icing, upset or stall training.</p>
response	<p>Noted.</p> <p>Level C and Level D FSTDs were chosen in order to be consistent and to harmonise with FAA 14 CFR Part 60 Change 2 amendment.</p> <p>With reference to GM4 ORO.FC.220 &amp; 230 ‘Operator conversion training and checking &amp; recurrent training and checking’, it is possible to use a Level B device if it meets at least Level C equivalence.</p>
comment	<p style="text-align: right;">19 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 21</p> <p><b>Paragraph No:</b> Appendix 1 to CS FSTD(A).300, Row 1.g.2</p> <p><b>Comment:</b> A ‘stick pusher system’ is a very specific term, other systems achieving the same</p>

effect are available. In terms of the CS, if the intent is to ensure that any system which impacts the longitudinal response of the aircraft on approach to stall be appropriately modelled, then a more generic term may be applicable.

For example, Boeing term the system on the B737 as ‘Elevator Feel Shift System’, it is not a traditional stick pusher system.

**Justification:** Appropriate terminology / clarity

**Proposed Text:**

Amend Row 1.g.2, column headed ‘Flight Simulation Training Device Standards’ to read as follows:

‘For aeroplanes equipped with systems to modify the longitudinal control feel and/or position on approach to stall, control forces, displacement, and surface position of the aeroplane correspond to those of the aeroplane being simulated.’

Amend Row 1.g.2, column headed ‘Compliance’ to read as follows:

‘A statement of compliance (SOC) is required verifying that the system has been modelled, programmed, and validated using the aeroplane manufacturer’s design data or other acceptable data source. The SOC must address, at a minimum, the system activation and cancellation logic as well as system dynamics, control displacement and forces as a result of the system activation.’

response

Partially accepted.

The ‘stick pusher system’ term is maintained to ensure alignment with FAA Part 60.

Clarification added.

comment

20

comment by: UK CAA

**Page No:** 22

**Paragraph No:** Appendix 1 to CS FSTD(A).300, Row 1.h.2

**Comment:** The ‘COMPLIANCE’ column states “An SOC is required that defines the source data used to construct the FSTD validation envelope. Please refer to AMC11 FSTD(A).300” . We believe this is incorrect as AMC 11 appears to be concerned with the testing requirements AMC12 FSTD(A).300(b)(2) appears to define the Validated Envelope.

**Justification:** Incorrect reference.

response

Accepted.

comment

21

comment by: UK CAA

**Page No:** 28



response	<p><b>Paragraph No:</b> Appendix 1 to CS FSTD(A).300, Row 1.t.1</p> <p><b>Comment:</b> The ‘COMPLIANCE’ column states “<i>Please refer to AMC12 FSTD(A).300</i>”. AMC13 FSTD(A).300 would appear to be more applicable.</p> <p><b>Justification:</b> Incorrect reference.</p> <p>Accepted.</p>
comment	<p>22 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 29 (new amendment to current FSTD document to be added)</p> <p><b>Paragraph No:</b> Appendix 1 to CS FSTD(A).300, Row 1.(v)(1)</p> <p><b>Comment:</b> We believe consideration should also be given to include the effects of ice on the mass properties including the airplane mass, centre of gravity and moments of inertia and have therefore proposed an additional amendment to Row 1.(v)(i) in the current FSTD document.</p> <p><b>Justification:</b> The accretion of ice also increases the overall mass and can move the cg resulting in further handling issues.</p> <p><b>Proposed Text:</b> Add additional amendment to text in first column in Row 1.(v)(i) in current FSTD document as follows:</p> <p>“... be implemented as a function of payload, fuel loading and ice accreted.”</p>
response	<p>Not accepted.</p> <p>It is not considered as a separate item. Please refer to t.1 and t.2 for the effects of icing.</p>
comment	<p>23 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 29</p> <p><b>Paragraph No:</b> Appendix 1 to CS FSTD(A).300, Row 2.a.1</p> <p><b>Comment:</b> The ‘COMPLIANCE’ column states ‘<i>....specific emphasis has to be placed on tuning out objectionable motion system responses</i>’</p> <p>It is not clear who/ how it is determined what is objectionable. Motion responses will always be unrepresentative and violent during aggressive handling inputs, such as may be required during UPRT.</p> <p><b>Justification:</b> Appropriateness/clarity</p> <p><b>Proposed Text:</b> Amend to read as follows: ‘<i>.... specific emphasis <u>should</u> be placed on tuning out objectionable motion system responses <u>where possible</u></i>’.</p>

response	Accepted.
comment	<p>24 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 30</p> <p><b>Paragraph No:</b> Appendix 1 to CS FSTD(A).300, Row 2.d.1</p> <p><b>Comment:</b> It is unclear whether the 'COMPLIANCE' statement: <i>"If there are known flight conditions where buffet is the first indication of the stall, or where no stall buffet occurs, this characteristic should be included in the model."</i> only applies to Level A devices.</p> <p>If not, we believe this sentence should be placed ahead of the Level A sentence. Alternatively, given that the requirement, in Row d.1.(6), already contains the text "(where applicable)", this could be deleted.</p> <p><b>Justification:</b> Clarity</p>
response	<p>Accepted.</p> <p>Text amended to ensure harmonisation with FAA CFR 14 Part 60 Change 2 amendment.</p>
comment	<p>55 <span style="float: right;">comment by: Luftfahrt-Bundesamt</span></p> <p>h.2 (page 22): it should be referenced to AMC<del>12</del>FSTD(A).300</p> <p>s.2 (page 27): it should be referenced to AMC9 FSTD(A).300</p> <p>s.3 (page 27): It is not clearly defined what a "subject-matter expert acceptable to the authority" is!</p>
response	Accepted.
comment	<p>60 <span style="float: right;">comment by: Dassault-Aviation</span></p> <p>Dassault-Aviation</p> <p>Page 27, CS FSTD(A).300.s.1, compliance column</p> <p><b>Text:</b> "- determine that the combination of...while performing the upset recovery manoeuvre"</p> <p><b>Comment:</b> AMC9 FSTD(A).300(a)(2) details a minimum of 3 manoeuvres (plural) to be evaluated</p> <p><b>Proposed changes:</b> "...performing the upset recovery manoeuvres"</p>
response	Not accepted.



The paragraph refers to each one of the three manoeuvres that have been performed individually.

comment

61

comment by: *Dassault-Aviation*

Dassault-Aviation

Page 27 CS FSTD(A).300,s.3 Compliance column

Text:

"An SOC is ...validation, as well and check...of the FSTD

Comment:

"as well" looks like a typo error

Proposed change:

remove "as well"

response

Accepted.

comment

62

comment by: *Dassault-Aviation*

Dassault-Aviation

Page 28, CS FSTD(A).300, T.1 compliance column

Text:

"Icing models must simulate...simulated aeroplane"

Comment:

"Must" is not an usual modal verb for EASA's publication. Should n't be replaced by "should"

Proposed change:

"Icing models should simulate...simulated aeroplane"

response

Partially accepted.

CS-FSTD are non-binding technical standards; however, the current rulemaking style guide does not foresee the use of 'should' but the use of verbs in the present tense instead.

comment

63

comment by: *Dassault-Aviation*

Dassault-Aviation

Page 28, CS FSTD(A).300, t.1, compliance column

Text:

"...in drag. Aeroplane systems (such as the stall protection system and auto flight system ( must respond...aeroplane"



<p>response</p>	<p>Comment: replace the second opening bracket by a closing bracket.</p> <p>Proposed change: systems (such as the stall protection system and auto flight system) must respond...aeroplane"</p>
<p>comment</p>	<p>64 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 28 CS FSTD(A).300, t1 Compliance column</p> <p>Text: "Icing models must simulate ...overall increase in drag"</p> <p>Comment: This statement is more stringent than the statement developed in AMC13 FSTD(A).300(d)(2)- First paragraph, last sentence: "Typical recognition cues <b>that may be present</b> depending on the simulated aeroplane include..."</p> <p>Proposed change: Icing models...including (if present on the simulated airplane) loss of lift...increase in drag"</p>
<p>response</p>	<p>Accepted.</p>
<p>comment</p>	<p>65 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 28, CS FSTD(A).300, t.1 compliance column</p> <p>Text: Acceptable analytical...with tuning and supplemental subjective assessment by a subject-matter expert pilot"</p> <p>Comment: What is the profile/experience required from this "icing" SME pilot? Must he/she the same SME pilot described in AMC10 FSTD(A).300(e)?</p>
<p>response</p>	<p>Accepted. Text amended for clarity.</p>
<p>comment</p>	<p>67 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 28 CS FSTD(A).300, t.1 Compliance column</p>

response	<p>Text: " Please refer to AMC12 FSTDA.300"</p> <p>Comment: AMC12 provides guidance on UPRT whereas t.1 is about icing</p> <p>Proposed change: " Please refer to AMC13 FSTDA.300"</p>
Accepted.	
comment	<p>68 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 29, CS FSTD(A).300, t.2 first column</p> <p>Text: "Modelling that includes the effects of airframe and engine icing"</p> <p>Comment: Shouldn't this paragraph replicate the wording of t.1 which has been modified</p> <p>Proposed change: "Modelling that includes the effects of icing where appropriate, on the airframe ..."</p>
response	<p>Accepted.</p> <p>Redrafted to make it consistent with t.1.</p>
comment	<p>95 <span style="float: right;">comment by: <i>The Boeing Company</i></span></p> <p>Page: 21 of 118 Appendix 1 to CS FSTD(A).300 Flight Simulation Training Device Standards Paragraph: g.2</p> <p><b><u>THE PROPOSED TEXT STATES:</u></b> For aeroplanes equipped with a stick pusher system, control forces, displacement, and surface position of the aeroplane correspond to those of the aeroplane being simulated.</p> <p><b><u>REQUESTED CHANGE:</u></b> For aeroplanes equipped with a stick pusher system, control forces, displacement, and surface position of the aeroplane <b><i>shall</i></b> correspond to those of the aeroplane being simulated.</p> <p><b><u>JUSTIFICATION:</u></b> Editorial correction.</p>



response

Not accepted.  
CS-FSTD states mandatory requirements, thus 'shall' is not foreseen.

comment

96

comment by: *The Boeing Company*

Page: 21 of 118  
Appendix 1 to CS FSTD(A).300 Flight Simulation Training Device Standards  
Paragraph: g.2

The same requirement in 14 CFR Part 60 Change 2 notes that "The requirements in this section only apply to those FSTDs that are qualified for full stall training tasks."

**THE PROPOSED TEXT STATES:****REQUESTED CHANGE:**

Add a note to the requirement that states: "*The requirements in this section only apply to those FSTDs that are qualified for full stall training tasks.*"

**JUSTIFICATION:**

Ensures harmonization with 14 CFR Part 60 Change 2.

response

Accepted.  
To ensure harmonisation with FAA Part 60 Change 2.

comment

97

comment by: *The Boeing Company*

Page: 22 of 118  
Appendix 1 to CS FSTD(A).300 Flight Simulation Training Device Standards  
Paragraph: h.2

**THE PROPOSED TEXT STATES:**

The FSTD must have a real-time feedback tool to notify the instructor/evaluator whenever the FSTD training envelope or aeroplane operating limits have been exceeded.

**REQUESTED CHANGE:**

The FSTD must have a real-time feedback tool *that provides* to notify the instructor/evaluator *visibility of* whenever the FSTD training envelope or aeroplane operating limits have been exceeded.



<p>response</p>	<div style="border: 1px solid black; padding: 5px;"> <p><b>JUSTIFICATION:</b> The intent of our suggested change is to provide clarity. The proposed text would imply that the IOS needs to actively alert the instructor of exceedance of the different envelopes. Is that the intent of this requirement? The use of the FSTD training envelope requires some judgement and interpretation and is not a discrete answer.</p> </div> <p>Accepted. Text amended to provide clarity.</p>
<p>comment</p>	<p>98 <span style="float: right;">comment by: <i>The Boeing Company</i></span></p> <div style="border: 1px solid black; padding: 5px;"> <p>Page: 22 of 118 Appendix 1 to CS FSTD(A).300 Flight Simulation Training Device Standards Paragraph: h.2</p> </div> <p><b><u>THE PROPOSED TEXT STATES:</u></b></p> <p>(a) FSTD validation envelope: this must be in form of an alpha/beta envelope (or equivalent method) depicting the ‘confidence level’ of the aerodynamic model,. This ‘confidence level’ depending on the degree of flight validation or on the source of predictive methods.</p> <p><b><u>REQUESTED CHANGE:</u></b></p> <p>(a) FSTD validation envelope: this must be in form of an alpha/beta envelope (or equivalent method) depicting the ‘confidence level’ of the aerodynamic model,. This ‘confidence level’ depending <b><i>depends</i></b> on the degree of flight validation or on the source of predictive methods.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b><u>JUSTIFICATION:</u></b> Editorial correction.</p> </div>
<p>response</p>	<p>Accepted.</p>
<p>comment</p>	<p>99 <span style="float: right;">comment by: <i>The Boeing Company</i></span></p>

Page: 27 of 118  
 Appendix 1 to CS FSTD(A).300 Flight Simulation Training Device Standards  
 Paragraph: s.1

**THE PROPOSED TEXT STATES:**

Statement of compliance require, to:

- include Mach effect, aeroelastic representations, and non-linearities due to sideslip;
- include separate tests for thrust effects;
- determine that the combination of angle of attack and sideslip does not exceed the range of flight-test-validated data or wind tunnel/analytical data while performing the upset recovery manoeuvre.

**REQUESTED CHANGE:**

Statement of compliance *required*, to:

- include Mach effect, aeroelastic representations, **ground effect** and non-linearities due to sideslip;
- include separate tests for thrust effects;
- determine that the combination of angle of attack and sideslip does not exceed the range of flight-test-validated data or wind tunnel/analytical data while performing the upset recovery manoeuvre.

**JUSTIFICATION:**

This entry mixes aerodynamic modelling requirements under the control of the data provider and how training will be conducted. The ability to stay within the flight test validated or wind tunnel/analytical alpha/beta envelope is dependent on the technique used to recover and the method used to induce the upset. The last requirement should be removed from this entry and linked to IOS requirements. This is done in AMC9 FSTD(A).300 *Guidance on upset, stall (including in icing conditions), and qualification of FSTDs* where the removed text appears.

This change also ensures consistency with 14 CFR Part 60.

response

Accepted.

Alignment with FAA 14 CFR Part 60.

comment

100

comment by: *The Boeing Company*

Page: 27 of 118  
 Appendix 1 to CS FSTD(A).300 Flight Simulation Training Device Standards  
 Paragraph: s.2

**THE PROPOSED TEXT STATES:**

The aerodynamic model has to incorporate an angle of attack and sideslip range to support the training tasks.

**REQUESTED CHANGE:**



The aerodynamic model has to **shall** incorporate **data representing the aeroplane characteristics covering** an angle of attack and sideslip range to support the training tasks.

**JUSTIFICATION:**

Editorial change to provide clarity of the requirement.

response

Partially accepted.  
CS-FSTD states mandatory requirements, thus 'shall' is not foreseen.

comment

101

comment by: *The Boeing Company*

Page: 29 of 118

Appendix 1 to CS FSTD(A).300 Flight Simulation Training Device Standards

Paragraph: a.1

**THE PROPOSED TEXT STATES:**

Special consideration is given to the motion system response during upset prevention and recovery manoeuvres. Notwithstanding the limitations of simulator motion, specific emphasis has to be placed on tuning out objectionable motion system responses.

**REQUESTED CHANGE:**

**For Level C or D devices,** Special consideration is given to the motion system response during upset prevention and recovery manoeuvres. Notwithstanding the limitations of simulator motion, specific emphasis has to be placed on tuning out objectionable motion system responses.

**JUSTIFICATION:**

Editorial change to provide clarity of the requirement. This text only applies to Level C or D devices and does not apply to Level A or B devices. The original text would imply UPRT can be accomplished on a Level A or B device.

response

Accepted.

comment

120

comment by: *FAA*

27	s.1	This section appears to explicitly limit aerodynamic model development to the use of flight test data provided only by the aircraft OEM.	Change language to allow for alternate paths for Training Device Manufacturers (TDMs) or others to independently collect flight test and other data to model and validate FSTDs.
27	s.3	Section does not contain recommended aerodynamic modeling to 10 degrees beyond the stall identification AOA. If the belief is that the phrase "to support stall-recovery training	Consider including a specification for minimum AOA range as recommended in the IATA FSTD data document and in ICAO

	<p>tasks" suffices as a replacement for 10 deg requirement, considerable caution should be applied. Establishing the necessary angle-of-attack range to properly train the general pilot population requires a sufficient number of pilot subjects for statistical validity, and evidence to date suggests that manufacturers may not fully appreciate the requirements to do so.</p>	<p>9625. The purpose of this requirement is to ensure aerodynamic model continuity to a representative level should the trainee exceed the stall AOA during the recovery.</p>
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response

Noted.

s.1. This is the same language as before (therefore no change for WP1).

s.3 Angle of attack range is described in AMC10 FSTD(A).300(d)(2) Validity range.

comment

131

comment by: GAMA

h.2 states "Additionally, and optionally, a recording system may be utilized." GAMA reinforces the statement that the recording system must remain optional.

response

Noted.

comment

132

comment by: GAMA

h.2 Compliance (b) states, in part, "... These must enable the instructor and examiner to assess..."

That indicates both an instructor and examiner must be present.

Suggest the wording is changed to say "... These must enable the instructor/evaluator to assess..." The change indicates either an instructor or evaluator may be present and keeps the wording consistent with the first section of h.2 and the associated AMC.

response

Accepted.

s.2 validity range in AMC10 FSTD(A).300 covers the AoA range.

comment

135

comment by: FlightSafety International - Regional Director Regulatory Affairs

Flight Simulation Training Device Standards h.2 states "Additionally, and **optionally**, a recording system may be utilized."

FlightSafety International wishes to emphasise the optional nature of this recording mechanism. It must remain optional and not become a requirement

response

Noted.

comment

136

comment by: FlightSafety International - Regional Director Regulatory Affairs



	<p>Flight Simulation Training Device Standards - h.2 Under Compliance subpara (b) states, in part, "... these must enable the instructor and examiner to assess..."</p> <p>That wording implies that both an instructor and examiner must be present. FlightSafety International suggests the following text change to clarify this compliance measure:</p> <p>"... These must enable the instructor or evaluator to assess..." The change clarifies that <u>either</u> an instructor or an evaluator may be present. It also keeps the wording consistent with the wording of h.2 and the associated AMC.</p>
response	Accepted.
comment	<p>141 <span style="float: right;">comment by: Ryanair ATO</span></p> <p><b>Comment:</b> Minor text adjustment – close bracket</p> <p><b>Recommended Text Change:</b> Icing models must simulate the aerodynamic degradation effects of ice accretion on the aeroplane-lifting surfaces, including loss of lift, decrease in stall angle of attack, change in pitching moment, decrease in control effectiveness, and changes in control forces in addition to any overall increase in drag. Aeroplane systems (such as the stall protection system and auto flight system) (must respond properly to ice accretion, consistent with the simulated aeroplane.</p>
response	Accepted.
comment	<p>157 <span style="float: right;">comment by: Flight Simulation Company FSC</span></p> <p><b>Comment:</b> A 'stick pusher system' is a specific term and should be more generic.</p>
response	<p>Not accepted.</p> <p>The term is used in FAA Part 60, and is maintained to ensure harmonisation and consistency.</p>
comment	<p>158 <span style="float: right;">comment by: Flight Simulation Company FSC</span></p> <p><b>Comment:</b> The feedback tool should not only give a notification of an operating limits exceedance but the deviation to it as well.</p> <p><b>Justification:</b> Only the exceedance notification is not enough for a proper debriefing after a session. Deviation information in relation to inputs is necessary for a complete understanding.</p>
response	<p>Noted.</p> <p>Please refer to AMC12 and GM12.</p>
comment	<p>160 <span style="float: right;">comment by: Flight Simulation Company FSC</span></p>

response	<p>Comment/question: Is it possible to give a definition of real-time?</p> <p>Applicable to all real-time references.</p> <p>Noted.</p> <p>'Real-time' is used in the general accepted terms by FSTD operators/manufacturers. May be addressed in work package 3 (WP3).</p>
comment	<p>164 <span style="float: right;">comment by: <i>Flight Simulation Company FSC</i></span></p> <p><b><u>Page 22, h.2</u></b></p> <p><b>Comment:</b> The word 'displacements' should be changed in 'inputs' as it is applicable to fly-by-wire aircraft as well.</p>
response	<p>Not accepted.</p> <p>The text already clarifies that is applicable to fly-by-wire aeroplanes.</p>
comment	<p>165 <span style="float: right;">comment by: <i>Flight Simulation Company FSC</i></span></p> <p><b><u>Page 23, h.3</u></b></p> <p><b>Comment:</b> The upset scenarios should be configured on the basis of input by the OEM's. This input can (should) be published within OSD to have it available to all stake-holders.</p>
response	<p>Noted.</p> <p>Already implemented:</p> <ul style="list-style-type: none"> <li>— There is a validated FSTD envelope derived from the data package, hence the OEM input (or better 'type-specific input') occurs with regard to the FSTD capabilities.</li> <li>— Furthermore, when there is a need for type-specific upset scenarios beyond generic training profiles, these will be identified in the OSD FC as mandatory training areas of special emphasis (TASEs), including any associated scenarios, as needed.</li> </ul>
comment	<p>177 <span style="float: right;">comment by: <i>International Development of Technology b.v.</i></span></p> <p>Regarding Item s.1 on page 27, it is stated in CS-FSTD(A) under the column "compliance":</p> <ul style="list-style-type: none"> <li>• determine that the combination of angle of attack and sideslip does not exceed the range of flight-test-validated data or wind tunnel/analytical data while performing the upset recovery manoeuvre.</li> </ul> <p>I would like to raise a concern regarding the proper understanding of this:</p> <p>Firstly, it may be possible to do several prevention and recovery exercises <i>without</i> exceeding</p>

the VTE, even when the bounds are not displayed in the simulator. For example, an exercise may be conducted to demonstrate a condition that is well within the flight envelope or g-limit boundaries. This can already advance the knowledge on, for example, energy management and AoA awareness.

**It would be inappropriate for authorities to prevent operators from starting their upset awareness and prevention exercises immediately as several “UPRT” maneuvers could occur well within the valid flight envelope.**

Secondly, the determination of a “VTE” may be through the expert opinion of an SME who may be in a better position to determine if the maneuver or exercise would endanger the aircraft. This is because the certification envelope may in fact be very limited and there may be no data outside of this limit. Please keep in mind that the OEM may not be the only source available for *acceptable* data w.r.t. the training requirements.

The FAA has approved FSTD's that adhere to the latter defined method through a prudent interaction with the SME pilot, operator and provider of that system.

response

Noted.

comment

179

comment by: *International Development of Technology b.v.*

EASA requires training up to "first indication of stall". It has been brought to our attention that, in stick shaker/pusher equipped aircraft, certain operators believe that the training is complete once the stick shaker training has been carried out.

This would suggest that the pilots of stick pusher equipped aircraft would not experience the secondary level of protection that the pusher offers (namely, envelope protection).

Perhaps EAS will need to clarify this at a higher level.

response

Noted.

SIB 2013-02 clarifies the point. The training objective is ‘Recognition of the stall warning indications and understanding the need to initiate the stall recovery procedure at the first indication of a stall’. First indication of stall might be the SW, stick shaker, or even the buffet.

For aeroplanes equipped with a stick pusher, it is recommended that pilots accomplish theoretical training and practical training in an FFS and experience the sudden forward movement of the control wheel during the stick pusher activation.

comment

180

comment by: *International Development of Technology b.v.*

There is an impetus to introduce a more objective means of qualifying motion cueing with respect to the cues perceived by the pilot in the aircraft. As a system becomes less stable (such as an aircraft approaching a stall), the human pilot relies increasingly on visual and non-visual feedback to maintain stability.

ICAO and the FAA have adopted the Objective Motion Cueing Test as a step towards non-subjective qualification of the motion cues in FSTD's.



response	<p>Not accepted.</p> <p>Not considered during the current work package (WP1). It may be considered for work package 2 (WP2).</p>
comment	<p>181 <span style="float: right;">comment by: <i>International Development of Technology b.v.</i></span></p> <p>NOTE: The stall deterrent buffet may at times be heavy. The realistic simulation of these amplitudes may impact the integrity of the simulator, especially older devices.</p> <p>It has been brought to our attention that that certain operators (and authorities) are struggling with this.</p> <p>Perhaps further clarification is required.</p>
response	<p>Accepted.</p> <p>See comment #15 by Airbus.</p>
comment	<p>192 <span style="float: right;">comment by: <i>CAE Inc.</i></span></p> <p>Page #46, i.1 Engine and airframe icing effects Demonstration (high angle of attack).</p> <p>Please clarify the use of tolerances for this test, per its title it is intended to be a "Demonstration". This deviates from the 14 CFR Part-60 Change 2 requirement for the same test (2.i) as well the ICAO Doc. 9625 Edition 4 requirements. Furthermore AMC9 300(b)(3)(ii and iii) also speaks to a requirement for the demonstration of the icing effects.</p> <p>We expect this is simply an editorial error.</p>
response	<p>Accepted.</p> <p>To ensure harmonisation with FAA Part 60 Change 2.</p>
comment	<p>197 <span style="float: right;">comment by: <i>Finnish Transport Safety Agency</i></span></p> <p>Appendix 1 to CS FSTD(A).300 – table point h.2</p> <p>It is not clear on what "equivalent methods" are appropriate. For example apparently a V-n diagram would not substitute alpha/beta envelope. But a Alpha/Mach envelope could be acceptable.</p> <p>It is recommended to change the text to give better information on what is acceptable and what is not.</p>
response	<p>Noted.</p> <p>See AMC12(c) (IOS feedback mechanism) and GM12 for further guidance material. AMC12 also refers to the ICAO Airplane Upset Prevention &amp; Recovery Training Aid (AUPRTA), Revision 3, February 2017. It is required that the instructor/evaluator is provided with a minimum set of feedback tools to properly evaluate the trainee's performance in</p>

accomplishing an upset recovery training task. FSTD operators may develop other methods and feedback mechanisms that provide the required parameters and support the training programme objectives.

comment	198 <span style="float: right;">comment by: <i>Finnish Transport Safety Agency</i></span>
	<p>Appendix 1 to CS FSTD(A).300 – table point s.3</p> <p>There is no clear criteria on what is required for a pilot to be acceptable as a subject matter expert (SME) on this area. Please add such criteria. If a clear criteria is not included, it is evident that different authorities will make very different interpretations on this area.</p> <p>AMC9 FSTD(A).300 paragraph (a)(1)(i) tells information on pilot requirements, but it is not self evident if that paragraph is talking about SME or not. Cross reference from here to AMC9 FSTD(A).300 should be added to make if AMC9 FSTD(A).300 tells about SMEs.</p>
response	<p>Not accepted.</p> <p>References are already provided in the compliance field.</p>

**3. Proposed amendments and rationale in detail | 3.1. Draft certification specifications (Draft EASA decision) | 3.1.2. CS-FSTD(A) — Book 2**

p. 33-72

comment	9 <span style="float: right;">comment by: <i>AIRBUS</i></span>
	<p>Airbus comment 2: COMMENT SECTION: Page 42 / Table FSTD validation tests / test 2.c.8(a) "In normal state, it is expected that stall envelope protections will take effect, and it may not be possible to reach the aerodynamic-stall condition. In these circumstances, it is adequate to complete the test until the envelope protection is cancelled."</p> <p>PROPOSED TEXT: "For CCA aircraft with stall envelope protection systems: In normal state, it is expected that stall envelope protections will take effect, and it may not be possible to reach the aerodynamic-stall condition. In these circumstances, it is adequate to complete the test once the effects of the envelope protection system are demonstrated. These tests may be used to satisfy the required (angel of attack) flight maneuver and envelope protection tests (2.h.6.)"</p> <p>REASON FOR COMMENT: Airbus proposes to be aligning more with the FAA, FAR Part-60 change 2 and allow the use of the reference data of the 2.h.6 test; otherwise, it might become necessary to provide extra data, which is not relevant.</p>
response	<p>Noted.</p> <p>Text amended to align with FAA Part 60 Change 2.</p>



comment	<p style="text-align: right;">comment by: AIRBUS</p> <p>10</p> <p>Airbus comments 3 (&amp; 4) COMMENT RELATED SECTION: Page 46 / FSTD validation tests / test 2.i Engine and Airframe icing effects/ column TOLERANCE: Airspeed and rate of climb are under tolerance"</p> <p>PROPOSED TEXT: Airbus proposes to replace the text with "none" in the TOLERANCE column.</p> <p>REASON FOR COMMENT: Airbus believes there should be no parameter under tolerance, as it is the case in the FAA, FAR Part-60 change 2.</p> <p>Airbus comment 4 COMMENT RELATED SECTION: Page 48 / FSTD validation tests / test 3.g.5 and following/ Numbering.</p> <p>PROPOSED (NEW) TEXT: What we suggest is to align the numbering of the 3.g tests with the one of the 3.f tests in the FAA, FAR Part-60 change 2. This means that:</p> <ul style="list-style-type: none"> <li>- 3.g.5 should become "Stall buffet";</li> <li>- 3.g.6 should remain "High speed or Mach buffet";</li> <li>- 3.g.7 should remain "In-flight vibrations";</li> <li>- 3.g.8 should be created as "Approach to Stall buffet"</li> </ul> <p>REASON FOR COMMENT: Airbus proposes alignment with FAA, FAR Part-60 change 2.</p>
response	<p>Partially accepted.</p> <p>To ensure alignment with FAA Part 60 Change 2.</p> <p>3.g.8 not required as 3.g.5 is applicable for those aeroplanes which exhibit stall buffet before the activation of the stall warning system.</p>
comment	<p style="text-align: right;">comment by: AIRBUS</p> <p>11</p> <p>Airbus comment 5: COMMENT RELATED SECTION: Page 62 / AMC10 FSTD(A) 300 / Paragraph (d) (2) Validity Range /"distinctive indication to <b>ease</b> any further increase in the angle of attack"</p> <p>PROPOSED TEXT: "distinctive indication to <b>cease</b> any further increase in the angle of attack"</p> <p>REASON FOR COMMENT: Editorial change, the wording "ease" should be "cease".</p>
response	<p>Accepted.</p>
comment	<p style="text-align: right;">comment by: AIRBUS</p> <p>12</p> <p>Airbus comment 6.</p>

response	<p>COMMENT RELATED SECTION: Page 65 / AMC11 FSTD(A).300. Airbus opinion is that the 2.j QTG test is not required for FSTDs already qualified under CS-FSTD(A) issue 1.</p> <p>PROPOSED NEW TEXT: Airbus proposes to add the following new text as subparagraph (f): "(f) Objective demonstration tests of engine and airframe icing effects (AMC1, FSTD validation tests, test 2.i) are not required for previously qualified FSTDs"</p> <p>REASON FOR COMMENT: Airbus proposal is to be in alignment with FAA, FAR Part-60 change 2 /directive 2, section III)</p>
comment	<p>13 <span style="float: right;">comment by: AIRBUS</span></p> <p>Airbus comment 7: COMMENT RELATED SECTION: Page 65 / AMC11 FSTD(A).300 / (d) "Objective testing for characteristic motion vibrations (please refer to Table of FSTD Validation tests, 3.g.(6)) is not required where the FSTD's stall buffets have been subjectively evaluated by an SME pilot. For previously qualified Level D FSTD's that currently have objective <b>stall buffet</b> tests in their approved MQTG, the results of these existing tests must be provided to the competent authority with the updated stall and stall buffet models in place."</p> <p>PROPOSED TEXT: Airbus proposes the following change: (d) Objective testing for characteristic motion vibrations (please refer to Table of FSTD Validation Tests 3.g.(6)) is not required where the FSTD's stall buffets have been subjectively evaluated by an SME pilot. For previously qualified Level D FSTD's that currently have <b>objective approach to stall buffet</b> tests in their approved MQTG, the results of these existing tests must be provided to the competent authority with the updated stall and stall buffet models in place.</p> <p>REASON FOR COMMENT: Justification. Airbus changes are made for more consistency, previously qualified FSTD comply with CS-FRSTD(A) issue 1 (or earlier JAA documents), where there is only an "approach to stall buffet" QTG test.</p>
response	Accepted.
comment	<p>14 <span style="float: right;">comment by: AIRBUS</span></p> <p>Airbus comment 8: COMMENT RELATED SECTION: Page 69 / GM12 / (c) (2) Pimary flight display, including: (i) pitch attitude; (ii) roll attitude; (iii) turn/sideslip; (iv) indicated airspeed; (v) stall-warning speed / stall buffet speed;</p>

(vi) VMO/MMO;  
 (vii) altitude;  
 (viii) rate of climb;  
 (ix) autopilot status; and  
 (x) auto-throttle status

PROPOSED TEXT:  
 Do not make explicit reference to a Primary Flight Display (which is not present on every aircraft).  
 Airbus proposal: " Display of the primary flight parameters; if applicable , display a copy of the Primary Flight Display (PFD); if a PDF is displayed, then the parameters shall be the same as the ones displayed on the aircraft PFD."

REASON FOR COMMENT:  
 Airbus proposes to be less prescriptive of one solution; be more open to all types of Aircraft...

response

Accepted.

comment

15 comment by: AIRBUS

Airbus comment 9:  
 COMMENT RELATED SECTION: Page 59/ AMC9 FSTD(A).300 / (b) (1) "(ix) The maximum buffet may be limited based on motionplatform capability / limitations or other simulator system limitations"

PROPOSED TEXT:  
 Airbus proposes:  
 (ix) The maximum buffet may be limited based on motion platform capability / limitations or other simulator system limitations. If the maximum buffet is limited, the limit should be sufficient to allow proper use in training (e.g.: not less that 0.5 g peak to peak). And in any case the instructor should be informed of the limitations.

REASON FOR COMMENT:  
 Stall buffet is paramount for stall training on Airbus aircraft.  
 Do not allow down-turning of the stall buffet for maintenance reasons, this would be detrimental to fidelity and training value.

response

Accepted.

comment

16 comment by: AIRBUS

Airbus comment 10.  
 COMMENT RELATED SECTION: Page 67 / AMC12 FSTD(A)300 / (b) (2) (ii) Wind tunnel and / or analytical region.  
 This is the region of the flight envelope for which the FSTD has not been compared to flight test data, but for which there has been wind tunnel testing or the use of other reliable predictive methods (typically by the aeroplane manufacturer) to define the aerodynamic model."

PROPOSED TEXT:



response	<p>Airbus proposes: (ii) Wind tunnel and / or analytical region. This is the region of the flight envelope for which there has been wind tunnel testing or the use of other reliable predictive methods (typically by the earoplane manufacturer) to define the aerodynamic model. "</p> <p>REASON FOR COMMENT: In some part of the envelope, flight test data may be available, where no wind tunnel data is available. The absence of flight test data does not define the wind tunnel envelope.</p>
	Accepted.
comment	<p>25 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 34</p> <p><b>Paragraph No:</b> AMC1 FSTD(A).200, paragraph 3.1.2 (b)</p> <p><b>Comment:</b> We believe the meaning for MMO is incorrect and propose that the ICAO definition should be used.</p> <p><b>Justification:</b> Appropriate terminology.</p> <p><b>Proposed Text:</b> Amend to read: 'MMO – Maximum Mach Operating Speed'</p>
response	<p>Partially accepted.</p> <p>The terminology is consistent with CS 25.1505 'Maximum operating limit speed', which is defined as follows:</p> <p>'The maximum operating limit speed (Vmo/Mmo, airspeed or Mach number, whichever is critical at a particular altitude) is a speed that may not be deliberately exceeded in any regime of flight.'</p>
comment	<p>26 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 34</p> <p><b>Paragraph No:</b> AMC1 FSTD(A).200, paragraph 3.1.2 (b)</p> <p><b>Comment:</b> We believe the meaning for VMO is incorrect and propose that the ICAO definition should be used.</p> <p><b>Justification:</b> Appropriate terminology.</p> <p><b>Proposed Text:</b> Amend to read: 'VMO – Maximum Operating Speed'</p>
response	<p>Partially accepted.</p> <p>The terminology is consistent with CS 25.1505 'Maximum operating limit speed', which is</p>

defined as follows:

'The maximum operating limit speed (Vmo/Mmo, airspeed or Mach number, whichever is critical at a particular altitude) is a speed that may not be deliberately exceeded in any regime of flight.'

comment

27

comment by: UK CAA

**Page No:** 37

**Paragraph No:** AMC1 FSTD(A).300, Test 2.a.(10)

**Comment:** Test 2.a.(10) states '*Stick pusher system force calibration (if applicable)*'  
However, other systems need to be considered.

For example, Boeing term the system on the B737 as 'Elevator Feel Shift System', it is not a traditional stick pusher system. Were this system to be tested on ground as suggested there would be no effect on the column, it would have to have the column displaced from neutral for any effect.

**Justification:** Appropriate terminology / clarity.

**Proposed Text:** Amend Test 2.a.(10) to read: '*Longitudinal Control Stall (if applicable)*'.

response

Not accepted.

The 'stick pusher system' terminology is maintained to ensure alignment with FAA Part 60.

comment

28

comment by: UK CAA

**Page No:** 37

**Paragraph No:** AMC1 FSTD(A).300, Test 2.a.(10), Notes column

**Comment:** It is not clear how this may be validated or whether a computed force is to be allowable We believe a real force measurement (e.g. Fokker style) will be very problematic.

**Justification:** The instantaneous, dynamic nature of a Stick Pusher system could cause problems in accurately measuring the column force that it generates.

response

Noted.

The flight condition allows for the test to be conducted either on ground or in flight. Data would be expected to meet either case.

comment

29

comment by: UK CAA

**Page No:** 41

**Paragraph No:** AMC1 FSTD(A).300, Test 2.(c).(8a)



	<p><b>Comment:</b> The flaps up ‘stall area’ at lower altitudes as well as the cruise has been found to be lacking on numerous occasions by the UK CAA in the past, we recommend that it is also tested at the lower altitudes as well</p> <p><b>Justification:</b> Safety.</p>
response	<p>Not accepted.</p> <p>The requirement is based on harmonisation with FAA Part 60. This would have been an additional requirement. Therefore, no addition to ensure consistency and alignment with FAA 14 CFR Part 60 Change 2 amendment.</p>
comment	<p>30 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 42 and 43</p> <p><b>Paragraph No:</b> AMC1 FSTD(A).300, Test 2.c.(8a)</p> <p><b>Comment:</b> There are two statements in the COMPLIANCE column where the wording is not clear and its meaning is not fully understood, as follows:</p> <ol style="list-style-type: none"> <li>1. “... In these circumstances, it is adequate to complete the test until the envelope protection is cancelled”.</li> <li>2. “... and the modelling beyond the stall angle of attack is limited to continuity and completion of recovery”.</li> </ol> <p><b>Justification:</b> Clarity requested.</p>
response	<p>Accepted.</p> <p>Item 1: see comment #9 by Airbus.</p> <p>Item 2: reference to AMC9 FSTD(A).300(3).</p>
comment	<p>31 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 42 and 59</p> <p><b>Paragraph No:</b> AMC1 FSTD(A).300 Test 2.c.(8a) and AMC9 FSTD(A).300(b)(1)(xii)</p> <p><b>Comment:</b> We believe it may be helpful to clarify that this test is only required if full stall training privileges are sought.</p> <p><b>Justification:</b> This test is only required for FSTDs qualified to conduct full-stall training tasks, ref FSTD(A).300(b)(1)(xii)</p>

response	<p><b>Proposed Text:</b> Amend as follows:</p> <p>Change test name to (8a) “Stall characteristics <b>(if applicable)</b>” and include in COMMENTS column: “This test is only for FSTDs qualified to conduct full-stall training tasks”.</p> <p>Move AMC9 FSTD(A).300(b)(1)(xii) to AMC9 FSTD(A).300(b)(1)(i) so that it is the first statement that is read.</p>
comment	<p>32 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 46</p> <p><b>Paragraph No:</b> AMC1 FSTD(A).300 Test 2.i.(1)</p> <p><b>Comment:</b> The test tolerances state “<i>but not less than aeroplane performance data</i>”. If the intention is that this should be compared with published airplane minimum performance data from the AFM it should state as such to be consistent with other tests.</p> <p><b>Justification:</b> Alignment with other tests, , e.g. 1.c(2)</p> <p><b>Proposed Text:</b> Change: “but not less than aeroplane performance data.” to “but not less than applicable AFM data”.</p>
response	<p>Accepted.</p> <p>No tolerance needed for this test.</p>
comment	<p>33 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 48</p> <p><b>Paragraph No:</b> AMC1 FSTD(A).300 Test 3.g.(6)</p> <p><b>Comment:</b> The text in the COMMENTS column: “... <i>for those aeroplanes which exhibit stall buffet before the activation of the stall-warning system.</i>” needs clarification on the difference between this case test and 3.g.(5) in the current FSTD document– Approach to Stall buffet. It is not clear what the difference between these two tests would be.</p> <p>Test 3.g.(6) implies that approach to stall buffet checking is required for a level C FFS, but 3.g.(5) implies that it is not. We believe that 3.g.(5) in the current FSTD document should also be subject to the same amendment to address this inconsistency.</p> <p><b>Justification:</b> Clarification</p>
response	<p>Accepted.</p> <p>To ensure alignment with FAA Part 60.</p> <p>QTG test is required only for FSTDs that are qualified for full-stall training tasks or for those aeroplanes which exhibit stall buffet before the activation of the stall warning system. Thus, if a Level C device is to be qualified for the optional full-stall training task, then the stall</p>

buffet test is required.

comment

34

comment by: UK CAA

**Page No:** 52

**Paragraph No:** AMC1 FSTD(A).300 Test 3.n.(6)

**Comment:** We believe the Note appears to be misplaced for a Subjective section. The content is more Objective based.

**Justification:** Validation of this requirement will be more through Objective testing.

response

Partially accepted.

Indeed, there is an element which refers to the objective evaluation; however, the text is maintained to ensure harmonisation with FAA Part 60.

comment

35

comment by: UK CAA

**Page No:** 53

**Paragraph No:** AMC1 FSTD(A).300 Test 3.p.(2)(a)

**Comment:** We believe the reference at the foot of the page in column 1 is incorrect.

**Justification:** The reference quoted should be AMC13 FSTD(A).300.

**Proposed Text:** Amend to read: "Please refer to AMC13 FSTD(A).300."

response

Accepted.

comment

36

comment by: UK CAA

**Page No:** 56

**Paragraph No:** AMC9 FSTD(A).300 ,sub-paragraph (a)(1)(i)(B)

**Comment:** With regard to the statement '*have first-hand experience in recovering upset situations on a real aeroplane;*', it is not understood whether this must be on the FSTD type being tested or on any aeroplane type

**Justification:** Clarity required.

response

Accepted.

To ensure consistency and harmonisation with FAA 14 CFR Part 60 Change 2 amendment.

With reference to RMT.0581, it does not mandate a pilot with real aeroplane experience — item (B) deleted.



comment	<p>37 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 57</p> <p><b>Paragraph No:</b> AMC9 FSTD(A).300.(a)(3)(i)</p> <p><b>Comment:</b> Use of the word “contiguous” is not considered the best term.</p> <p><b>Justification:</b> It may not make sense to non-primary English speakers</p> <p><b>Proposed Text:</b> Amend to read as follows:</p> <p>“...the model should remain useable, without any apparent discontinuities, beyond the FSTD training envelope....”</p>
response	Accepted.
comment	<p>38 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 57</p> <p><b>Paragraph No:</b> AMC9 FSTD(A).300.(a)(4)(ii)</p> <p><b>Comment:</b> The text appears to be two requirements in one line and we believe should be separated..</p> <p><b>Justification:</b> Two separate stages of the stall are referenced together.</p> <p><b>Proposed Text:</b> Amend to read:</p> <p>“(ii) degradation in control response (pitch, roll, yaw).  (iii) uncommanded roll response or roll-off requiring significant control deflection to counter”</p> <p>Then all lines following to be renumbered</p>
response	Accepted.
comment	<p>39 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 59</p> <p><b>Paragraph No:</b> AMC9 FSTD(A).300(b)(3).</p> <p><b>Comment:</b> The formatting of this paragraph is not in line with the previous paragraph</p> <p><b>Justification:</b> Consistency of formatting.</p> <p><b>Proposed Text:</b> Align paragraph (3)(i) through ((iv) with previous section.</p>



response	Accepted.
comment	<p>40 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 59</p> <p><b>Paragraph No:</b> AMC9 FSTD(A).300.(b)(3)(i)</p> <p><b>Comment:</b> The wording in the first sentence is not fully understood.</p> <p>Confirmation is requested that time histories to <u>full stall</u> due to icing accretion are required and not just to stall speed. This is not referenced anywhere else. In fact, page 28 Row 1.t.1, states that any stall protection system “....must respond properly to ice accretion....”, so it is unclear what is required if the aircraft does not stall under icing conditions</p> <p><b>Justification:</b> Clarity requested.</p>
response	<p>Accepted.</p> <p>To ensure alignment with FAA Part 60. Time history to full stall due to icing accretion.</p>
comment	<p>41 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 62</p> <p><b>Paragraph No:</b> AMC10 FSTD(A).300.(d)(2)(v)</p> <p><b>Comment:</b> Stick Pusher is not mentioned. We believe explicit mention of Stick Pusher should be included.</p> <p><b>Justification:</b> The Stick Pusher should be considered as part of the stall envelope protection system and, therefore, disabling it and/or suggested failures associated with it should also be included.</p>
response	<p>Not accepted.</p> <p>To ensure alignment with FAA Part 60.</p> <p>The stick pusher is considered as a cue in itself, whereas the envelope protections do not provide cues.</p>
comment	<p>42 <span style="float: right;">comment by: UK CAA</span></p> <p><b>Page No:</b> 69</p> <p><b>Paragraph No:</b> GM12 FSTD(A).300.(c)(1)(ii)</p> <p><b>Comment:</b> We believe the list of parameters should be more specific for flight control inputs.</p> <p><b>Justification:</b> AMC 12 FSTD(A).300.(c).(1).(ii) states that cockpit control forces, and flight</p>

	<p>control law for fly by wire aeroplanes, must be part of the feedback data in the mechanism available to instructors. The new GM mentions “Time history of control inputs” only.</p> <p><b>Proposed Text:</b> Amend as follows:</p> <p>Replace ‘Time history of control inputs’ with the following: “Time history of control inputs, including cockpit control forces and flight control law (fly by wire aircraft), as applicable.”</p>
response	Accepted.
comment	<p>57 <span style="float: right;">comment by: <i>Luftfahrt-Bundesamt</i></span></p> <p>i.(1) (page 47): What is meant by “ice on and ice off”? Only Icing conditions or Anti-Ice System of the Aeroplane?</p>
response	<p>Noted.</p> <p>To ensure alignment with FAA Part 60. It refers to ‘without ice accretion/with ice accretion’.</p>
comment	<p>66 <span style="float: right;">comment by: <i>Estonian Civil Aviation Administration</i></span></p> <p>AMC11 FSTD(A).300 Guidance on approach to stall for qualified FSTDs gives guidance for FSTDs already qualified under CS-FSTD(A). Is it also applicable for FSTDs qualified under JAR requirements (for example JAR-STD 3A) taking into account ORA.FSTD.210 requirement that the qualification basis that was effective on the date of the application for the initial qualification shall be applicable for future recurrent qualifications of the device?</p>
response	<p>Noted.</p> <p>Yes, it is applicable.</p>
comment	<p>70 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 41, AMC1 FSTD(A).300, (3), table of FSTD validation, 2.C(8a)</p> <p>Comment:</p> <p>It should be clearly stated that this item is only applicable to those FSTDs used to conduct stall training</p> <p>Proposed change:</p> <p>Add "Applicable only for those FSTDs that are to be qualified for aerodynamic stall training tasks"</p>
response	Accepted.
comment	<p>71 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p>

response	<p>Page 42 AMC1 FSTD(A).300, (3), 2.C(8a)</p> <p>Text: "...condition. In these circumstances, it is ...protection is cancelled"</p> <p>Comment: This sentence should be clarified. Does it mean that it is acceptable for completing the test to enter the stall event until the envelope protection system ceases ?</p>
	<p>Noted.</p> <p>Please refer to comment #9 by Airbus.</p>
comment	<p>72 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>P 46, AMC1 FSTD(A).300, 2.i(1) tolerance column.</p> <p>Comment: This precision is a non sense. If compared to the FAA part60 rev 2 (attachment 2 to appendix A to part 60- FFS OBJECTIVE TESTS- 1.c.2), it looks like the word "requirement" is missing</p> <p>Proposed change: "...aeroplane performance data requirement"</p>
response	<p>Accepted.</p> <p>To ensure alignment with FAA Part 60.</p>
comment	<p>73 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 46, AMC1 FSTD(A).300, 2.i(1) tolerance column</p> <p>Text:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>± 3 kt airspeed ± 0.5 m/s (100 ft/ min) or ±5 % rate of climb, but not less than aeroplane performance data.</p> </div> <p>Comment: What is the reference this figures should be compared to ? Additionnaly, to align with the FAA part 60 rev 2 (Attachment 2 to appendix A to part 60- FFS objective tests-2.i), these figures should be deleted.</p> <p>Proposed change: remove the tolerances</p>

response Accepted.  
To ensure alignment with FAA Part 60.

comment 74 comment by: *Dassault-Aviation*  
Dassault-Aviation  
Page 56 AMC9 FSTD(A).300, (a)(1)(ii)  
Text:  
The statement...validation envelope, or when the envelope... accuracy"  
Comment:

This statement is a copy and paste from the Part60 . It is not in line with the spirit of this NPA:  
- The recovery procedure must be reasonably achievable within the FSTD training envelope;  
- If the recovery manoeuvre requires to overshoot the training envelope, then the SOC should present it as a limitation (CF AMC9 FSTD(A).300 (a)(3)(ii) & (a)(4)(vi)(B)), not as something acceptable based on the sole judgement of the evaluation pilot. If this statement is unchanged, then making the evaluation will require additional guidance on what is the "realms of confidence in the simulation accuracy".

Proposed change:  
"The statement of...the FSTD does not to exceed the FSTD training envelope"

response Accepted.

comment 75 comment by: *Dassault-Aviation*  
Dassault-Aviation  
Page 57, AMC9 FSTD(A).300, (a)(2)(i)(A)  
Text:  
"a nose high-wing level aeroplane upset"  
Comment:  
Is there any reason to mandate the wing to be level for the nose-high upset manoeuvre and not the nose-low?  
Proposed change:  
"a nose-high wing-level aeroplane upset"

response	<p>Not accepted.</p> <p>To ensure alignment with FAA Part 60.</p>
comment	<p>76 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 57, AMC9 FSTD(A).300, (a)(2)(iii)</p> <p>Comment:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Because the word "evaluator" is placed side-by-side with instructor, I believe it designates the individual supervising the pilots' examinations. --&gt; If YES: In the FCL language, he/she is designated as "examiner" instead of "evaluator". Moreover, NPA 2015-13 (loss of control prevention and recovery training) does not allow the examiner to select stall and upset exercises for testing or checking (Appendix 9 - training matrix - items 3.7 and 3.7.1). As a consequence, "evaluator" should be deleted. --&gt; If NO, then "evaluator" refers to the SME pilot or the "suitably qualified pilot". In that case the wording should be clarified.</p> </div> <p>As a consequence all the "instructor/evaluator" instances in the document should be evaluated and clarifies as necessary.</p>
response	<p>Not accepted.</p> <p>The term 'instructor/evaluator' is in alignment with FAA Part 60. The term is used to show to the evaluator that the requirement, as described under CS-FSTD(A), is also available to the instructor.</p>
comment	<p>77 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 58 AMC9 FSTD(A).300, (b)(1)(ii)</p> <p>Text:</p> <p>"Each of the following stall entries must be demonstrated in at least on the three flight conditions:"</p> <p>Comment:</p> <p>It could be helpful to precise/repeat what the flight conditions are</p> <p>Proposed change:</p> <p>Each of the following stall entries must be demonstrated in at least on the three flight conditions (2nd segment climb- high altitude-approach/landing):</p>

response

Accepted.  
Reference added in the text.

comment

78 comment by: *Dassault-Aviation*  
Dassault-Aviation  
Page 59 AMC9 FSTD(A).300,(b)(3)(i)  
Comment:  
Typo/tabulation: (3) and (i)(ii)... shouldn't be at the same level

response

Accepted.

comment

79 comment by: *Dassault-Aviation*  
Dassault-Aviation  
Page 62 AMC10 FSTD(A).300, (d)(2)(v)  
Comment:  
The four preceding items (identified (i), (ii), (iii) and (iv)) are different characteristics answering the open point: "where one or more of the following characteristics occur". But item (v) does not answer that point and therefore should be placed at the same level than the preceding paragraph "The FSTD operator should declare..."

response

Accepted.

comment

80 comment by: *Dassault-Aviation*  
Dassault-Aviation  
Page 64 AMC10 FSTD(A).300, (e)(4)(1)  
Text:  
"an assessment of pilot availability demonstrating that a suitably qualified pilot, meeting...available."  
Comment:  
The term "suitably qualified pilot" should be avoided as it can confused with the term (and its definition) detailed in AMC9 FSTD(A).300(a)(1)(i)  
Proposed change:  
an assessment of pilot availability demonstrating that a suitably qualified pilot, meeting...available."



response	Partially accepted. Text amended.
comment	<p>81 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>page 64 AMC10 FSTD(A).300,(f)</p> <p>Text: "The increase in angle of attack beyond...a value greater than the...manoeuvre"</p> <p>Comment: This sentence is a non-sense except if adding "not" before "greater than".</p> <p>Proposed text: "The increase in angle of attack beyond...a value not greater than the...manoeuvre"</p>
response	Accepted.
comment	<p>82 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 64 AMC10 FSTD(A).300, f</p> <p>Comment: The instructor should be fully aware of the limitations and deviances of the simulator compared to the real airplane. It is suggested to complement the paragraph f with the following recommandation.</p> <p>Proposed change: Add the folowing in paragraph f</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>"For the instructor to properly manage and debrief the high angle of attack / stall events, additional information should be accessible which indicates the limitations of the aerodynamic model for particular stall event manoeuvres (such as aeroplane configuration, approach-to-stall entry methods, and limited range for continuity of the modelling), the deviances from the real airplane the SME pilot accepted during the evaluation and the magnitude of the buffet damping when the buffet is limited based on motion platform capability/limitations or other simulator system limitations."</p> </div>
response	<p>Not accepted.</p> <p>This reference is relevant to the high angle of attack/staff model evaluation subjective tests. It is not meant to provide guidance for the instructor — this is covered by AMC12 and GM12.</p>



See also reference to instructors in Part-ORO, ORO.FC.220 & 230.

comment

83

comment by: *Dassault-Aviation*

Dassault-Aviation

Page 65 AMC11 FSTD(A).300, (b)

Text:

"For the testing of the high-altitude cruise and turning-flight stall conditions, these manoeuvres may be subjectively evaluated by a qualified SME pilot and addressed in the required statement of compliance (SOC)"

Comment:

It could be precised for clarification that the required SME pilot profile is detailed in AMC10

Proposed change:

For the testing of the high-altitude cruise and turning-flight stall conditions, these manoeuvres may be subjectively evaluated by a qualified SME pilot (please refer to AMC10 FSTD(A).300 (e)) and addressed in the required statement of compliance (SOC)

response

Accepted.

comment

84

comment by: *Dassault-Aviation*

Dassault-Aviation

Page 65 AMC 11 FSTD(A).300,(b)

" these tests should utilise the footprint method to document the SME evaluation and this should be included in the approved master qualification test guide (MQTG)"

Comment:

Shouldn't the "footprint method" be detailed for clarification?

response

Not accepted.

Please refer to GM1 ORA.FSTD.200.

comment

85

comment by: *Dassault-Aviation*



response	<p>Dassault-Aviation</p> <p>Page 65 AMC11 FSTD(A).300, (c)</p> <p>Comment: It could be precised that the SME pilot profile is detailed in AMC10</p> <p>Proposed change:</p> <div style="border: 1px solid black; padding: 5px;"> <p>Where existing flight test validation data in the FSTD's MQTG is missing required parameters, or is otherwise unsuitable to fully meet the objective testing provisions, the competent authority may accept alternative sources of validation, including subjective validation by an SME pilot with direct experience in the stall characteristics of the aeroplane (please refer to AMC10 FSTD(A).300 (e)).</p> </div> <p>Accepted.</p>
comment	<p>86 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 67 AMC12 FSTD(A).300, (c)(1) First paragraph last sentence</p> <p>Text: "At a minimum, the following must be available to the instructor/evaluator"</p> <p>Comment:</p> <div style="border: 1px solid black; padding: 5px;"> <p>From direct experience with the FAA, it can happen that the instructor sits down in a pilot seat (thus being side-by-side with the trainee) for initiating an exercise or demonstrating a recovery for example. The rule should precise that the IOS feedback data should be available to the instructor whatever his/her seat</p> <p>Proposed text: "At a minimum, the following must be available to the instructor/evaluator (whatever the seat he/she is occupying)"</p> </div>
response	<p>Not accepted.</p>
comment	<p>87 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 68 AMC12 FSTD(A).300, (c)(1)(iii)(C)</p>

<p>response</p>	<p>Text: "angle of attack and stall identification angle-of-attack (please refer to AMC 10 FSTD(A).300(d)(2) for additional information on the definition of the stall identification angle-of-attack)</p> <p>Comment: Because stall identification can be subjective (when the deterrent buffet comes first), the rule should precise who is in charge of determining the stall identification angle-of-attack (aircraft manufacturer, data provider, SME pilot?).</p> <p>Accepted. Text amended. Concerning the provision of the information, the data provider can give some values, but providing the information for all weights, CGs, Mach numbers, configurations, etc., would require a dedicated model. The data provider needs to supply the stall identification angle of attack.</p>
<p>comment</p>	<p>89 <span style="float: right;">comment by: Dassault-Aviation</span></p> <p>Dassault-Aviation</p> <p>Page 68 AMC12 FSTD(A).300, (c)(2)</p> <p>Text: Optionally, a recorded feedback mechanism is available to the instructor/evaluator</p> <p>Comment: The interest of a replay mainly lies in a "hot" debriefing (i.e. in the cockpit, before doing again an exercise that was poorly executed at first). As a consequence, the verbiage should suggest that both pilots should be able to see a replay of the recorded data from their seats in the simulator.</p> <p>Proposed change: "Optionally, a recorded feedback mechanism is available to the instructor/evaluator. For a "hot" debriefing during the training session, both pilots should be able to see the replay of the recorded data from their seats."</p>
<p>response</p>	<p>Not accepted. The option has been provided to allow FSTD operators to develop other methods and feedback mechanisms that are not available under AMC12 (c)(1).</p>

comment	<p>90 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 69 GM12 FSTD(A).300, (c)(1)</p> <p>Text: " Control inputs, including:..."</p> <p>Comment:</p> <div style="border: 1px solid black; padding: 5px;"> <p>To be more precise, especially for CCA aircraft, what should be displayed is the pilot induced control inputs.</p> <p>Proposed change: " Pilot induced Control inputs, including:..."</p> </div>
response	<p>Accepted.</p>
comment	<p>91 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 72 AMC13 FSTD(A).300, (d)(1)(vii)</p> <p>Text: "flight control inputs;.."</p> <p>Comment:</p> <div style="border: 1px solid black; padding: 5px;"> <p>To be more precise, especially for CCA aircraft, what should be displayed is the pilot induced control inputs.</p> <p>Proposed change: "Pilot induced flight control inputs;.."</p> </div>
response	<p>Accepted.</p>
comment	<p>92 <span style="float: right;">comment by: <i>Dassault-Aviation</i></span></p> <p>Dassault-Aviation</p> <p>Page 72 AMC13 FSTD(A).300, (d)(2)</p>

Comment:  
It should be precised that the 'fuu' stall pmanoeuvre is only required for those FSTD to be qualified for aerodynamic-stall training tasks.

Proposed change:

"...The selected manoeuvre must demonstrate the effects of ice accretion at high angles of attack from a trimmed condition through approach to stall and 'full' stall ('full' stall is only required for those FSTD to be qualified for aerodynamic-stall training tasks), as compared to a baseline (no ice build-up) test..."

response

Accepted.

comment

102

comment by: *The Boeing Company*

Page: 33 of 118  
AMC1 FSTD(A).200 Terminology and abbreviations  
Paragraph: (a) Terminology

**THE PROPOSED TEXT STATES:**

'High angle of attack' means flying at an angle higher than in normal operation beyond the first indication of stall or stall protection systems, whichever occurs first.

**REQUESTED CHANGE:**

'High angle of attack' means flying at an angle ***of attack*** higher than in normal operation beyond the first indication of stall or stall protection systems, whichever occurs first.

**JUSTIFICATION:**

Editorial change to provide clarity of the requirement.

response

Accepted.

comment

103

comment by: *The Boeing Company*

Page: 37 of 118  
SUBPART C – AEROPLANE FLIGHT SIMULATION TRAINING DEVICES  
AMC1 FSTD(A).300 Qualification basis  
Table of FSTD Validation Tests  
Test 2a(10) Stick pusher system force calibration

**THE PROPOSED TEXT STATES:**

**REQUESTED CHANGE:**

Add note stating: ***"This test is required only for FSTDs qualified to conduct full stall training"***

	<p><b>tasks.”</b></p> <p><b>JUSTIFICATION:</b> Ensures consistency with 14 CFR Part 60.</p>
response	<p>Not accepted.</p> <p>The stick pusher can be part of the approach-to-stall training even if the FSTD is not capable of simulating full stall.</p>
comment	<p>104 <span style="float: right;">comment by: <i>The Boeing Company</i></span></p>
	<p>Page: 42 of 118 SUBPART C – AEROPLANE FLIGHT SIMULATION TRAINING DEVICES AMC1 FSTD(A).300 Qualification basis Table of FSTD Validation Tests Test 2c(8a) Stall characteristics</p> <p><b>THE PROPOSED TEXT STATES:</b> In normal state, it is expected that envelope protections will take effect, and it may not be possible to reach the aerodynamic-stall condition. In these circumstances, it is adequate to complete the test until the envelope protection is cancelled.</p> <p><b>REQUESTED CHANGE:</b> In normal <i>control</i> state, it is expected that envelope protections will take effect, and it may not be possible to reach the aerodynamic-stall condition <b>for some aeroplanes</b>. In these circumstances, it is adequate to complete the test until the envelope protection is cancelled. <b>the test is only required for an angle of attack range necessary to demonstrate the correct operation of the system.</b></p> <p><b>JUSTIFICATION:</b> The suggested change is consistent with the language used in Paragraph (b)(1) (vi) in AMC9 FSTD(A).300 <i>Guidance on upset, stall (including in icing conditions), and qualification of FSTDs.</i></p>
response	<p>Accepted.</p> <p>The test is only required for an angle of attack range necessary to demonstrate the correct operation of the system.</p> <p>Please refer to comment #9 by Airbus.</p>
comment	<p>105 <span style="float: right;">comment by: <i>The Boeing Company</i></span></p>

Page: 42/43 of 118  
 SUBPART C – AEROPLANE FLIGHT SIMULATION TRAINING DEVICES  
 AMC1 FSTD(A).300 Qualification basis  
 Table of FSTD Validation Tests  
 Test 2c(8a) Stall characteristics

**THE PROPOSED TEXT STATES:**

For safety of flight considerations, the flight test data may be limited to the stall angle of attack, and the modelling beyond the stall angle of attack is limited to continuity and completion of recovery.

**REQUESTED CHANGE:**

For safety of flight considerations, the flight test data may be limited to the stall angle of attack, and the modelling beyond the stall angle of attack is **only required to ensure** limited to continuity and completion of recovery.

**JUSTIFICATION:**

Editorial change to provide clarity of the requirement.

response

Accepted.

comment

106

comment by: *The Boeing Company*

Page: 46 of 118  
 SUBPART C – AEROPLANE FLIGHT SIMULATION TRAINING DEVICES  
 AMC1 FSTD(A).300 Qualification basis  
 Table of FSTD Validation Tests  
 Test 2i ENGINE AND AIRFRAME ICING EFFECTS

**THE PROPOSED TEXT STATES:**

± 3 kt airspeed.  
 ± 0.5 m/s (100 ft/ min) or ± 5 % rate of climb, but not less than aeroplane performance data.

**REQUESTED CHANGE:**

± 3 kt airspeed.  
 ± 0.5 m/s (100 ft/ min) or ± 5 % rate of climb, but not less than aeroplane performance data.

**JUSTIFICATION:**

Our suggestion is to ensure consistency with 14 CFR Part 60. This test is intended to demonstrate representative effects relative to the baseline case and do not require tolerances.

response

Accepted.



To ensure alignment with FAA Part 60.

comment

107

comment by: *The Boeing Company*

Page: 50 of 118  
Table of Functions and Subjective Tests  
f Manoeuvres

**THE PROPOSED TEXT STATES:**

(1)(a) High angle of attack, approach to stalls, stall warning, and stall buffet, (and g-break if applicable)(take-off, cruise, approach, and landing configuration) including reaction of the autoflight system and stall protection system

**REQUESTED CHANGE:**

(1)(a) High angle of attack, approach to stalls, stall warning, and stall buffet, (and g-break if applicable)(take-off, cruise, approach, and landing configuration) including reaction of the autoflight system and stall protection system

**JUSTIFICATION:**

“g-break” is typically associated with full stall and does not belong in the approach to stall test.

response

Accepted.  
Reference added in 1.b and deleted in 1.a.

comment

108

comment by: *The Boeing Company*

Page: 52 of 118  
Table of Functions and Subjective Tests  
n Motion Effects

(6) Approach to stall buffet and stall buffet

**THE PROPOSED TEXT STATES:**

6) Approach to stall buffet and stall buffet (where applicable)

(a) Conduct an approach-to-stall with engines at idle and a deceleration of 1 kt/s. Check that the motion cues...

**REQUESTED CHANGE:**

6) Approach to stall buffet and s Stall buffet (where applicable)



**(a) Approach-to-stall buffet** (with check marks for Level A through D devices)

**(b) Full stall buffet (where applicable)** (with check marks for Level C and D devices)

Conduct **a stall entry** with **the** engines at idle and a deceleration **rate** of 1 kt/s. Check that the motion cues...

**JUSTIFICATION:**

Editorial change to provide clarity of the requirement.

response

Partially accepted.

Clarification added in the note.

comment

109

comment by: *The Boeing Company*

Page: 56 of 118

AMC9 FSTD(A).300 Guidance on upset, stall (including in icing conditions), and qualification of FSTDs

Paragraph: (a)(1)(i)(B)

**THE PROPOSED TEXT STATES:**

(i) a suitably qualified pilot should:

(A) hold a type rating qualification for the aeroplane being simulated;

(B) have first-hand experience in recovering upset situations on a real aeroplane;

(C) be familiar with the upset scenarios and associated recovery methods as well as the cues necessary to accomplish the required training objectives;

**REQUESTED CHANGE:**

(i) a suitably qualified pilot should:

(A) hold a type rating qualification for the aeroplane being simulated;

(B) have first-hand experience in recovering upset situations on a real aeroplane;

**(BC)** be familiar with the upset scenarios and associated recovery methods as well as the cues necessary to accomplish the required training objectives;

**JUSTIFICATION:**

The proposed text in (B) is not consistent with 14 CFR Part 60. Entries (A) and (C) should be adequate requirements for UPRT that does not focus on stall or icing.

response

Partially accepted.

To ensure consistency and alignment with FAA 14 CFR Part 60 Change 2 amendment.

With reference to RMT.0581, it does not mandate a pilot with real aeroplane experience — item (B) deleted.



comment

110

comment by: *The Boeing Company*

Page: 57 of 118

AMC9 FSTD(A).300 Guidance on upset, stall (including in icing conditions), and qualification of FSTDs

Paragraph: (a)(3)(ii)

**THE PROPOSED TEXT STATES:**

(ii) where known limitations exist in the aerodynamic model for particular stall event manoeuvres (such as aeroplane configuration, approach-to-stall entry methods, and limited range for continuity of the modelling), these limitations should be declared in the required SOC.

**REQUESTED CHANGE:**

This paragraph should be removed.

**JUSTIFICATION:**

The paragraph in question is repeated in (a)(4)(vi)(B) of this section and refers specifically to s.3 dealing with stall characteristics. This is the proper location for this language.

response

Not accepted.

Paragraph (a)(4)(vi)(B) applies only to those FSTDs that are qualified for full-stall training tasks. There may be FSTDs which do have this capability, but are required to have an SOC as described in (a)(3)(ii).

comment

111

comment by: *The Boeing Company*

Page: 57/58 of 118

AMC9 FSTD(A).300 Guidance on upset, stall (including in icing conditions), and qualification of FSTDs

Paragraph: (a)(4) 1. General, s.3:

**THE PROPOSED TEXT STATES:**

(vi) stall buffet,

as appropriate to the aeroplane type;

(A) the model should be capable of capturing the variations seen in the stall characteristics of the aeroplane (e.g. the presence or absence of a pitch break, deterrent buffet, or other indications of a stall where present on the aeroplane);

(B) where known limitations exist in the aerodynamic model for particular stall manoeuvres (such as aeroplane configuration and stall-entry methods), these limitations must be declared in the required SOC;

(C) specific guidance should be available to the instructor which clearly communicates the flight configurations and stall manoeuvres that have been evaluated in the FSTD for use in training; and

(D) FSTDs qualified for full-stall training tasks must also meet the instructor operating



station (IOS) provisions for upset prevention and recovery training (UPRT) tasks as described under 1. General, h.2 of the FSTD standards table.

**REQUESTED CHANGE:**

(vi) stall buffet,

as appropriate to the aeroplane type;

(vii)(A) as appropriate to the aeroplane type the model should be capable of capturing the variations seen in the stall characteristics of the aeroplane (e.g. the presence or absence of a pitch break, deterrent buffet, or other indications of a stall where present on the aeroplane);

(viii)(B) where known limitations exist in the aerodynamic model for particular stall manoeuvres (such as aeroplane configuration and stall-entry methods), these limitations must be declared in the required SOC;

(ix)(C) specific guidance should be available to the instructor which clearly communicates the flight configurations and stall manoeuvres that have been evaluated in the FSTD for use in training; and

(x)(D) FSTDs qualified for full-stall training tasks must also meet the instructor operating station (IOS) provisions for upset prevention and recovery training (UPRT) tasks as described under 1. General, h.2 of the FSTD standards table.

**JUSTIFICATION:**

Entries (A) through (D) do not apply to (vi) stall buffet. These are general aerodynamic model and/or device requirements.

response

Accepted.

comment

112

comment by: *The Boeing Company*

Page: 62 of 118

AMC10 FSTD(A).300 Guidance on high-angle-of-attack/stall model evaluation

Paragraph: (d)(2)

**THE PROPOSED TEXT STATES:**

(v) for aeroplanes equipped with a stall envelope protection system, the model should allow training with the protection systems disabled or otherwise degraded (such as a degraded flight control mode as a result of a pitot/static system failure).

**REQUESTED CHANGE:**

(v) for **For** aeroplanes equipped with a stall envelope protection system, the model should allow training with the protection systems disabled or otherwise degraded (such as a degraded flight control mode as a result of a pitot/static system failure).

**JUSTIFICATION:**

This item is not part of the preceding list of characteristics identifying a stall; it is a requirement on the simulation model.



response

Accepted.

comment

113

comment by: *The Boeing Company*

Page: 64 of 118

AMC10 FSTD(A).300 Guidance on high-angle-of-attack/stall model evaluation

Paragraph: (f) SOC (subjective tests)

**THE PROPOSED TEXT STATES:**

In aeroplane certification flight tests, there is no provision to go beyond the maximum coefficient of lift (CL max), and the aeroplane is not to be held in full-stall condition, so this provision should be applied in the same way during the simulator's subjective evaluation.

The subjective tests of the simulation model should assess modelling continuity when slightly increasing the angle of attack beyond CL max.

The increase in angle of attack beyond CL max should be limited to a value greater than the maximum angle achieved two seconds after stall recognition, which is sufficient to allow a proper recovery manoeuvre.

**REQUESTED CHANGE:**

In aeroplane certification flight tests, there is no provision to go beyond the maximum coefficient of lift (CL max), and the aeroplane is not to be held indefinitely in a full-stall condition, so this provision should be applied in the same way during the simulator's subjective evaluation.

The subjective tests of the simulation model should assess modelling continuity when slightly increasing the angle of attack beyond ***the validity range defined in paragraph (d)(2) of this section*** CL max.

The increase in angle of attack beyond ***the validity range*** CL max should be limited to a value ***not to exceed*** greater than the maximum angle achieved two seconds after stall recognition, which is sufficient to allow a proper recovery manoeuvre.

**JUSTIFICATION:**

Editorial change to provide clarity of the requirement.

response

Accepted.

comment

114

comment by: *The Boeing Company*

Page: 64 of 118

AMC10 FSTD(A).300 Guidance on high-angle-of-attack/stall model evaluation

Paragraph: (f) SOC (subjective tests)



**THE PROPOSED TEXT STATES:**

Stall recognition is defined as:

- (1) no further increase in pitch when the pitch control is held on the aft stop for two seconds, leading to an inability to arrest the descent rate;
- (2) an uncommanded nose-down pitch that cannot be readily arrested, which may be accompanied by an uncommanded rolling motion;
- (3) buffeting of a magnitude and severity that is a strong and effective deterrent to a further increase in the AOA; and
- (4) activation of a stick pusher.

**REQUESTED CHANGE:**

This definition is slightly different than the one contained in paragraph (d)(2) of this AMC.

**JUSTIFICATION:**

Editorial comment. The definitions should be the same.

response

Accepted.

comment

115

comment by: *The Boeing Company*

Page: 64 of 118

AMC10 FSTD(A).300 Guidance on high-angle-of-attack/stall model evaluation

Paragraph: (f) SOC (subjective tests)

**THE PROPOSED TEXT STATES:**

The handling provisions at low speed and maximum angle of attack cover aeroplanes with protection. For pusher-equipped aeroplanes, this should be adequate to capture any inappropriate pilot action during the recovery procedure.

**REQUESTED CHANGE:**

Remove the paragraph.

**JUSTIFICATION:**

The intent of this paragraph is not clear. Stick pusher equipped aeroplanes are adequately covered under paragraph (d)(2)(iv) Validity Range on page 62.

response

Accepted.

See comment #96 by Boeing.

comment

116

comment by: *The Boeing Company*

Page: 65 of 118



AMC11 FSTD(A).300 Guidance on high angle of attack/stall model evaluation, and approach to stall for qualified FSTDs

**THE PROPOSED TEXT STATES:**

AMC11 FSTD(A).300 Guidance on high angle of attack/stall model evaluation, and approach to stall for qualified FSTDs

**REQUESTED CHANGE:**

AMC11 FSTD(A).300 Guidance on high angle of attack/stall model evaluation, and approach to stall for *previously* qualified FSTDs

**JUSTIFICATION:**

Editorial change to provide clarity of the requirement.

response

Accepted.

comment

117

comment by: *The Boeing Company*

Page: 66 of 118

AMC12 FSTD(A).300 Guidance on upset prevention and recovery training (UPRT) for the FSTD standards table

Paragraph: (b)(1)(iii)

**THE PROPOSED TEXT STATES:**

(iii) upset scenarios: where dynamic upset scenarios or aeroplane system malfunctions are used to drive the FSTD into an aeroplane upset condition, specific guidance must be available to the instructor on the IOS which describes how the upset scenario is driven along with any malfunction or degradation in FSTD functionality required to stimulate the upset.

**REQUESTED CHANGE:**

(iii) upset scenarios: where dynamic upset scenarios or aeroplane system malfunctions are used to drive the FSTD into an aeroplane upset condition, specific guidance must be available to the instructor on the IOS which describes how the upset scenario is driven along with any malfunction or degradation in FSTD functionality required to stimulate the upset.

**JUSTIFICATION:**

The current text is too restrictive. There should be other methods of having the guidance available to the instructor besides having it available electronically on the IOS. Is having the specific guidance available on a handout unacceptable?

response

Accepted.



comment

118

comment by: *The Boeing Company*

Page: 69 of 118

GM12 FSTD(A).300 Additional guidance on upset prevention and recovery training (UPRT) for the FSTD standards table

Paragraph: (c)

**The proposed text states:**

**GM12 FSTD(A).300 Additional guidance on upset prevention and recovery training (UPRT) for the FSTD standards table**

(c) IOS parameters

The tool should normally display:

(1) Control inputs, including:

(i) pitch,

(ii) roll,

(iii) rudder,

**REQUESTED CHANGE:**

(c) IOS parameters

The tool should normally display:

(1) Control inputs, including:

(i) pitch,

(ii) roll,

(iii) rudder *pedal*,

**JUSTIFICATION:**

Pedal should replace rudder on the IOS to distinguish system inputs (e.g. yaw damper) from pilot control inputs.

response

Accepted.

comment

121

comment by: *FAA*

41	2.c.8a	Requirement for control inputs to be plotted for correct trend and magnitude are missing.	Consider aligning test condition requirements with part 60 and ICAO 9625 Edition 4.
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response

Accepted.

To ensure alignment with FAA Part 60.

comment

122

comment by: FAA

64	5.(f)	The statement, “The increase in angle of attack beyond CL max should be limited to a value greater than the maximum angle achieved two seconds after stall recognition, which is sufficient to allow a proper recovery manoeuvre.” should also consider the aerodynamic modeling range as well.	Consider adding a statement to include consideration of the AOA range of the stall model validity. If EASA decides to not use the 10 degrees beyond stall modeling AOA criteria, it is possible the margin between the AOA range needed for stall identification/recovery and the end of stall model validity could be quite close and potentially be exceeded in this subjective checkout procedure.
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response

Accepted.

Statement added.

comment

128

comment by: *Frasca International, Inc.***Validation Test 2.c.(8b) – Approach-to-stall**

Three new cases have been added for the approach-to-stall validation test:

- **High altitude cruise** – AMC1 FSTD(A).300, FSTD Validation test 2.c.8b
- **Turning flight of at least 25°** – AMC9 FSTD(A).300(b)(2)(ii)(B)
- **Power-on** (propeller-driven aeroplanes only) – AMC9 FSTD(A).300(b)(2)(ii)(C)

These cases may not exist in existing data packages and would need to be collected for new FSTD qualifications, possibly at considerable expense to TDMs and operators. For FTDs in particular, the tolerances for the new Approach-to-stall test, along with the general level of expectation we have experienced during FTD evaluations, suggest that aircraft-specific data would almost certainly be required to validate this test.

Frasca International, Inc. proposes three changes to test 2.c.(8b), Approach-to-stall characteristics:

1. Allow the provisions in AMC11 FSTD(A).300 to be applied to the new approach-to-stall cases (as with post-stall) when existing flight test data are not available. With this provision, sub-part (c) of AMC11 would need to be amended to account for the class-representative nature of FNPT and BITD devices: “... SME pilot with direct experience in the stall characteristics of the aeroplane or class of aeroplanes, as appropriate to the qualification level.”
2. Limit the High Altitude Cruise case to aircraft with service ceilings above 25000 ft, or as deemed appropriate.
3. Clarify in AMC9 FSTD(A).300(b)(2) whether buffet needs to be validated in cases where it occurs after the first indication of stall. AMC10 FSTD(A).300(a) suggests that modeling only needs to be validated to the first indication unless the FSTD is approved for full-stall.



response	Accepted. It was not intended to add additional requirements for FTD in the context of WP1. Text amended.
comment	133 <span style="float: right;">comment by: GAMA</span>  (c)(2) states “Optionally, a recorded feedback mechanism is available to the instructor/evaluator.”  GAMA again wishes to reinforce that the recorded feedback mechanism must remain as an option and not a requirement.
response	Noted.
comment	134 <span style="float: right;">comment by: GAMA</span>  Para (b) last sentence states “The FSTD should include tools for the instructor to be able to immediately debrief the pilots after the training event.” Add the statement “All data collected for use in the UPRT debrief should be easily deleted after the UPRT training event.”
response	Accepted. Statement added.
comment	137 <span style="float: right;">comment by: FlightSafety International - Regional Director Regulatory Affairs</span>  Re: AMC12 FSTD(a).300 Guidance on upset prevention and recovery training (UPRT) for the FSTD standards table - Para (c) IOS feedback mechanism (c)(2) states “ <b>Optionally</b> , a recorded feedback mechanism is available to the instructor/evaluator.” FlightSafety International wishes to emphasise the OPTIONAL nature of this measure. It is not, nor should it be allowed to become, a requirement.
response	Noted.
comment	138 <span style="float: right;">comment by: FlightSafety International - Regional Director Regulatory Affairs</span>  Re: GM12 FSTD(A).300 Additional guidance on upset prevention and recovery training (UPRT) for the FSTD standards table - Para (b) - The last sentence states “The FSTD should include tools for the instructor to be able to immediately debrief the pilots after the training event.” FlightSafety strongly recommends insertion of the following statement: “The data collected for use in the debrief should be easily deleted after the training event.”  It is known that industry, manufacturer and pilot associations were adamant that such data should be deleted after each UPRT debriefing; no record should be kept of the pilot’s performance in UPRT scenarios.
response	Accepted.



comment	<p>142 <span style="float: right;">comment by: <i>Ryanair ATO</i></span></p> <p><b>Engine and Airframe Icing Effects i.(1)</b></p> <p>Ref: AMC9 FSTD(A).300(b)(3).Recommend that reference to Engine Core Icing is incorporated. Current text suggests that engines will only suffer from icing effects if the airframe has icing; however, this is not always the case.</p>
response	<p>Accepted.</p> <p>To ensure alignment with FAA Part 60. The text addresses both engine and airframe icing as distinct phenomena.</p>
comment	<p>143 <span style="float: right;">comment by: <i>Ryanair ATO</i></span></p> <p><b>Comment:</b></p> <p>Clarification requested as to whether this will be instructor initiated or environment initiated.</p> <p>Recommend that an Engine Core Icing scenario is incorporated which excludes airframe icing.</p>
response	<p>Not accepted.</p> <p>CS-FSTD(A) does not prescribe how icing is introduced. The objective is to ensure the demonstration of icing effects.</p>
comment	<p>144 <span style="float: right;">comment by: <i>Ryanair ATO</i></span></p> <p><b>AMC9 FSTD(A).300 Guidance on upset, stall (including in icing conditions), and qualification of FSTDs</b></p> <p><b>Comment:</b></p> <p>(a) (1) 1. (i) (B) should be considered in conjunction with RMT.0581.</p> <p>The requirement for the suitably qualified pilot to have first-hand UPRT experience on a real aeroplane (which is unlikely to be the type being simulated) is an unnecessary burden.</p> <p>The RMT.0581 rule making group have acknowledge the above and suggest that any real aircraft UPRT for existing instructors should be non-mandatory.</p>
response	<p>Partially accepted.</p> <p>Please refer to the same comment #109 by Boeing.</p> <p>After consideration, and with reference to RMT.0581, the requirement on (B) is removed.</p>
comment	<p>145 <span style="float: right;">comment by: <i>Ryanair ATO</i></span></p> <p><b>AMC10 FSTD(A).300 Guidance on high-angle-of-attack/stall model evaluation</b></p>

	(2) Validity range
	<p><b>Comment:</b></p> <p>Recommend that the responsibility to identify the validity range of the source data should rest with the simulator manufacturer and not the operator.</p>
response	<p>Not accepted.</p> <p>The operator applies for qualification, not the TDM.</p>
comment	<p>146 <span style="float: right;">comment by: Ryanair ATO</span></p> <p><b>AMC 10 FSTD(A).300 Guidance on high-angle-of-attack/stall model evaluation – SOC(aerodynamic model) ‘Statement of Compliance’</b></p> <p><b>Comment:</b></p> <p>(e) SOC (subject-matter expert (SME) pilot’s evaluation)</p> <p>This section should be rephrased to clarify that an SME SOC is only required for the certification of a ‘first of type’ simulator and therefore it should be provided by the simulator manufacturer and not the operator. Any other models of the same simulator should be exempt from this requirement once it’s using the ‘approved’ or ‘accepted’ data package.</p> <p>The requirements for the SME qualification would be unachievable for most operators.</p>
response	<p>Partially accepted.</p> <p>This section is based on harmonisation with FAA 14 CFR Part 60 Change 2 amendment, particularly as this is applicable only for those FSTDs that are to be qualified for aerodynamic stall training tasks.</p> <p>It is agreed that further clarity should be provided. In particular, the following is provided as information for this requirement:</p> <p>1) A statement of compliance (SOC) is provided by the data provider of the stall model (e.g. the OEM, or an alternative) that states how the model was put together, and verifies that it has been subjectively assessed by an appropriate SME.</p> <p>a. This is only required once, for each aeroplane stall model.</p> <p>b. This can be done on an appropriate engineering simulator, if that device is deemed appropriate by the competent authority.</p> <p>2) An additional statement of compliance (SOC) that relates to the implementation of the model on the specific FSTD that is to be qualified for stall training. This is the responsibility of the FSTD operator. (The FSTD operator can seek support to provide this SOC, e.g. from the aeroplane OEM, the FSTD manufacturer, the data provider, or from an acceptable alternative.)</p>
comment	<p>147 <span style="float: right;">comment by: Ryanair ATO</span></p> <p><b>AMC12 FSTD(A).300 Guidance on upset prevention and recovery training (UPRT) for the FSTD standards table.</b></p>

**(a) Background**

(3) FSTDs used to conduct training manoeuvres where the FSTD is repositioned either into an aeroplane upset condition or an artificial stimulus (such as weather phenomena or system failures) that is intended to result in a flight crew entering an aeroplane upset condition must be evaluated and qualified.

**Comment:**

Recommend that further consideration is given in the context of 'flight freeze' being active during a reposition for UPRT manoeuvres.

Suggest a requirement for dynamic manoeuvres to be used to avoid the threat of negative training associated with flight freeze and the motion fading in as the simulator is released from flight freeze.

response

Noted.

Guidance has been provided to ensure that negative training is prevented.

Please refer to 2. Motion system a.1 and h.3 Upset scenarios.

comment

150

comment by: *Bombardier*

AMC12 FSTD(A).300 (b)(1) (iii)

A severe dynamic upset or system malfunction could drive a pusher equipped aircraft to an AOA above the natural aerodynamic stall of this class of aircraft. The stall in this case may be an uncontrollable roll-off or pitch-up. How is this scenario to be handled? Is this expected to be modeled?

response

Noted.

The use of an FSTD in training is not within the CS-FSTD(A) scope.

Reference: AUPRTA rev3, section 8 'OEM recommended training sequences - Upset Prevention and Recovery Training - FSTD Scenarios'.

As part of the OSD process and related special emphasis training, such requirements will normally be addressed.

comment

151

comment by: *Bombardier*

AMC10 FSTD(A).300 (d)(2)(iv)

Inconsistent test requirements. Typical stick pusher system reliability is 10-5, typical FBW "Normal Mode" envelope protection reliability 10-7. Why should a failure in the envelope protection system have to be addressed but not the stick pusher system?

Why is a failure case combined with a stall (probability 10-5) considered at all?

response

Noted.

To ensure alignment with FAA Part 60.

comment

152

comment by: *Bombardier*

AMC13 FSTD(A).300(c)(1)



response	<p>Some "hard" wing aircraft are vulnerable to ice accretion along the leading edges. The stall AOA can be reduced significantly. Typically this type of wing is protected by a highly effective fully evaporative wing leading edge anti-icing system. The aircraft is vulnerable if the system is not activated when required. Does this scenario have to be modeled?</p> <p>Noted.</p> <p>As per current requirements, aircraft anti-icing systems should already be fully modelled to support training requirements, including any malfunctions as needed.</p> <p>Please refer to AMC13 FSTD(A).300 and the table of general requirements (Appendix to CS-FSTD(A).300 t.1.).</p>
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comment	<p>153 <span style="float: right;">comment by: <i>Bombardier</i></span></p> <p>AMC10 FSTD(A).300 (d)(3)(iii)          For protected aircraft (pusher or envelope protected) there is no aerodynamic stall and there may be little or no aerodynamic characteristics prior to system activation.</p>
response	<p>Noted.          The wording 'as applicable' caters for different types of aeroplanes.</p>

comment	<p>154 <span style="float: right;">comment by: <i>AIRBUS</i></span></p> <p>PAGE / SECTION COMMENT RELATED:          Page 64 of AMC10 FSTD(A)300 "Guidance on high-angle-attack/stall model evaluation".          Subject § (e) SOC "subject-matter expert (SME) pilot's evaluation"          .... An FSTD operator may submit a request to the competent authority for approval of a deviation from the SME pilot's experience provisions under this paragraph. This request for deviation must include the following information:          (1) an assessment of pilot availability demonstrating that a suitable qualified pilot, meeting the experience described in AMC10 FSTD(A), 300(e), is not available; and          (2) alternative methods to subjectively evaluate the FSTD's capability to provide the stall recognition cues and handling characteristics needed to accomplish the training objectives. ....</p> <p>PROPOSED TEXT:          Airbus would recommend to remove the above mentioned paragraph. Airbus strongly believes that an operator should not be allowed to deviate from the requirement to have the stall model of the FSTD validated by an SME, as validation covers a part of flight envelope that only dedicated SME's are knowledgeable about and may have experienced in their pilot like for being eligible to validate on a FSTD (mainly when referring to FFS cues).</p> <p>REASON:          It is currently very difficult, seen from an aircraft manufacturer perspective, to imagine alternative method to subjectively evaluate FSTD's capability to provide stall recognition cues and handling characteristics to accomplish the training objective.          It cannot be guaranteed that a non SME would validate adequately such an area of the flight envelope and as an outcome the FSTD may not replicate adequately the actual aircraft behavior. This would be detrimental to training objective as the model may not replicate</p>
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response	<p>adequately all the cues this misleading the trainee in an adequate recognition of such events.</p> <p>Not accepted.</p> <p>To ensure alignment with FAA Part 60.</p>
comment	<p>159 <span style="float: right;">comment by: <i>Flight Simulation Company FSC</i></span></p> <p><b><u>Page 56, Appendix 8 to AMC1 FSTD(A).300 General technical requirements for FSTD qualification levels, Qualification Level C and D.</u></b></p> <p><b>Comment:</b> This addition seems to implicate that the feedback mechanism should be part of the instructor operating station (IOS).</p> <p><b>Justification:</b> This is not the intention as it is contrary to GM12 FSTD(A).300 (b) "..... which may also be via a separate mobile device...".</p> <p>All text should be consistent when referring to the feedback mechanism tool. This is different than referring to the IOS, which can be the current IOS in case of a FSTD update.</p> <p><b>Proposed text:</b> An upset prevention and recovery training (UPRT) instructor feedback mechanism tool should be available.</p>
response	<p>Not accepted.</p> <p>The IOS may be made of several components, one being a separate mobile device.</p>
comment	<p>162 <span style="float: right;">comment by: <i>Flight Simulation Company FSC</i></span></p> <p><b>Comment:</b> A 'stick pusher system' is a specific term and should be more generic.</p>
response	<p>Not accepted.</p> <p>The 'stick pusher system' terminology is maintained to ensure alignment with FAA Part 60.</p>
comment	<p>163 <span style="float: right;">comment by: <i>Flight Simulation Company FSC</i></span></p> <p><b>Comment:</b> In our opinion there should be a connection between the upset recovery scenarios and OSD where the OEM can advise or prescribe on the scenarios to be trained. At this point there is no connection at all between OSD and this NPA.</p> <p>In general, the FSTD operator has the knowledge of the FSTD capabilities and/or limitations. But could have no knowledge regarding most effective scenarios to be trained for a specific type of aircraft. Furthermore, the input in this case, of a "suitably qualified pilot" is completely subjective.</p>

response	<p>Noted.</p> <p>The use of an FSTD in training is not within the CS-FSTD(A) scope.</p> <p>Reference: AUPRTA rev3, section 8 'OEM recommended training sequences - Upset Prevention and Recovery Training - FSTD Scenarios'. As part of the OSD process and related special emphasis training, such requirements will normally be addressed.</p>
comment	<p>199 <span style="float: right;">comment by: <i>Finnish Transport Safety Agency</i></span></p> <p>AMC9 FSTD(A).300 point (a)(1)(i)</p> <p>It is not clear if this requirement is applicable to SME pilot or not. If it is applicable, then it should be emphasized in the heading or in the text.</p>
response	<p>Not accepted.</p> <p>The SME and the suitably qualified pilot can be two different persons.</p>
comment	<p>8 <span style="float: right;">comment by: <i>AIRBUS</i></span></p> <p>Airbus comment 1:</p> <p>COMMENT RELATED TO SECTION: <b>Page 57</b> / AMC9 FSTD(A).300 / paragraph (a) (3) (i) "for continuity purposes, the model should remain contiguous beyond the FSTD training envelope to the extent to allow completion of the recovery training; and"</p> <p>PROPOSED TEXT 1:</p> <p>Airbus proposes "the continuity of model should be ensured beyond the FSTD training envelope in order to allow completion of the recovery training; and"</p> <p>REASON FOR COMMENT 1: Airbus proposes a better clarification of the sentence, removal of the term "contiguous".</p>
response	<p>Accepted.</p>



**4. Impact assessment (IA) | 4.5. What are the impacts** p. 102-112

comment	<p>129 <span style="float: right;">comment by: <i>KLM</i></span></p> <ul style="list-style-type: none"> <li>· The economic impact is not realistic. EASA assumes that for option 2 the total costs for the FSTD operators is 27.584.950 euro, for the assumed 805 devices that means 34.267 euro per device. We asked the sim manufacturers for quotations for our simulators, the quotations we got for our FSTD updates are almost 10 times higher.</li> </ul>
response	<p>Noted. The impact assessment has been updated.</p>

**4. Impact assessment (IA) | 4.6. Conclusion | Question to stakeholders** p. 114

comment	<p>130 <span style="float: right;">comment by: <i>KLM</i></span></p> <p>The economic impact is not realistic. EASA assumes that for option 2 the total costs for the FSTD operators is 27.584.950 euro, for the assumed 805 devices that means 34.267 euro per device. We asked the sim manufacturers for quotations for our simulators, the quotations we got for our FSTD updates are almost 10 times higher.</p>
response	<p>Noted. The impact assessment has been updated.</p>