Draft Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Regulations (EU) No 1178/2011 and (EU) No 965/2012

Important note:

This file is published for information purposes only. No quality control has been performed yet. The draft AMC and GM contained in this file are based on NPA 2024-101 and NPA 2024-108 consulted with the EASA Advisory Bodies through the focused consultations in 2024. The feedback and comments from these consultations have not been reflected yet in this version of the AMC and GM. In the event of significant updates, these be subject to a re-consultation in the course of 2025.

The amendments are arranged as follows to show deleted, new or amended, as well as unchanged text:

- deleted text is ~~struck through~~;
- new or amended text is highlighted in blue;
- an ellipsis '[...]' indicates that the rest of the text is unchanged.

Draft amendments – Regulation (EU) No 1178/2011 and associated AMC & GM

GM2 Article 2 Definitions

GROUP OF AIRCRAFT

When Part ARA, Subpart FSTD and Part ORA, Subpart FSTD refer to group of aircraft, it can be by defined by:

(1) aircraft category: aeroplane, helicopter, vertical take-off and landing (VTOL)-capable aircraft (VCA), airship, etc;

(2) engine configurations: single-engine piston, multi-engine piston, twin turboprop, twin-engine turbine, twinjet, trijet, etc.

(3) wake-turbulence categories: lightweight, medium-weight, heavyweight.

The following are some examples of how the group of aircraft can be displayed in the FSTD qualification certificate and other documents which refer to group of aircraft in Part ARA, Subpart FSTD and Part ORA, Subpart FSTD for the simulated aircraft:

Aeroplanes:

(a) lightweight single-engine piston aeroplane
(b) lightweight multi-engine piston aeroplane
(c) medium-weight twin turboprop aeroplane
(d) medium-weight twinjet aeroplane
(e) heavyweight trijet aeroplane

Helicopters:

(a) lightweight single-engine piston helicopter
(b) lightweight single-engine turbine helicopter
(c) lightweight twin-engine turbine helicopter
(d) medium-weight multi-engine turbine helicopter

Rationale: The GM is developed to provide clarifications on the use of the term "group of aircraft" in Part ARA. FSTD and ORA.FSTD.

AMC2 FCL.110.H LAPL(H) Experience requirements and crediting

RMT.0196

USE OF FSTD IN LAPL(H) TRAINING

(a) In case an FSTD is used in LAPL(H) training, it should:

(1) be qualified with an FCS in its qualification certificate;

(2) have all the following features at a fidelity level equal to or higher that R (representative):

(i) Flight Deck Layout and Structure;

(ii) Flight Controls Forces & Hardware;

(iii) Flight Controls Systems Operation;

(iv) Aircraft Systems;

(v) Performance & Handling – On Ground;

(vi) Performance & Handling – In Ground Effect;

(vii) Performance & Handling – Out of ground Effect.

(3) for those training tasks requiring cueing or environmental features, additionally, have an adequate fidelity level for the relevant features to complete such training tasks. The determination of the required fidelity levels should be based on an analysis of the training needs, taking into consideration the general requirements of CS-FSTD.

(b) Legacy FSTDs may be used for training provided that the representativeness of the FSTD to the type of helicopter used for the skill test is demonstrated by the training organisation, taking into consideration the technical specifications of the training device included in the qualification certificate and in the equipment specification list (ESL).

Rationale

In point FCL.110.H(a)(3)(i), the possibility to use in training an FSTD that represents the type of helicopter that is to be used for the skill test is granted. This AMC proposes two means to comply with such provision, by clarifying the technical requirements that an FSTD should have from a training perspective.

Point (a) presents the case of FSTDs qualified with an FCS, for which all the first seven FSTD features should be at least at representative 'R' fidelity level. In the case of training tasks that require cueing or environmental features, such features should present an adequate fidelity level for the execution of that task, whose determination should be based on an analysis of the training needs, taking into consideration the general requirements of CS-FSTD.

Point (b) presents the case of legacy FSTDs, which may be used if the representativeness of the FSTD is demonstrated.

AMC1 FCL.210.H PPL(H) Experience requirements and crediting

RMT.0196

USE OF FSTD IN PPL(H) TRAINING

(a) In case an FSTD is used in accordance with the provisions of point FCL.210.H(aa)(2)(i), it should:

(1) be qualified with an FCS in its qualification certificate;

(2) have all the following features at a fidelity level equal to or higher that R (representative):

(i) Flight Deck Layout and Structure

(ii) Flight Controls Forces & Hardware

(iii) Flight Controls Systems Operation

(iv) Aircraft Systems

(v) Performance & Handling – On Ground

(vi) Performance & Handling – In Ground Effect

(vii) Performance & Handling – Out of ground Effect

(3) for those training tasks requiring cueing or environmental features, additionally, have an adequate fidelity level for the relevant features to complete such training tasks. The determination of the required fidelity levels should be based on an analysis of the training needs, taking into consideration the general requirements of CS-FSTD.

(b) Legacy FSTDs may be used for training in accordance with the provisions of point FCL.210.H(aa)(2)(i), provided that the representativeness of the FSTD to the type of helicopter used for the skill test is demonstrated by the training organisation, taking into consideration the technical specifications of the training device included in the qualification certificate and in the equipment specification list (ESL).

Rationale

See the rationale for AMC2 FCL.110.H.

AMC2 FCL.1015 Examiner standardisation

RMT.0196

[...]

(p) Before undertaking a test or check, an examiner will verify that the aircraft or FSTD intended to be used is suitable and appropriately equipped for the test or check, on the basis of the FSTD

qualification certificate and the equipment specification list. Aircraft that fall under points (a), (b), (c), or (d) of Annex I to the Basic Regulation can be used provided that they are subject to an authorisation as per point ORA.ATO.135 or point DTO.GEN.240.

[...]

Rationale

The addition to point (p) is aimed to ensure that examiner relies on the FSTD qualification certificate and the equipment specification list (ESL) when assessing the suitability of the FSTD.

AMC3 to Appendix 9 Training, skill test and proficiency check for MPL, ATPL, type and class ratings, and proficiency check for IRs

RMT.0196

TRAINING MATRICES FOR TYPE RATING TRAINING

(a) General

(1) The training matrices provide, for each training task, the minimum fidelity levels that a training device should have for each of its features.

For each training task, the training matrices contain two rows with FCS as follows:

T (Training): The minimum FCS that an FSTD should have for the introduction of a training task. The training accomplished on such an FSTD should be credited towards the issuance of the type rating, but the training would not be completed to proficiency.

TP (Training to proficiency): The minimum FCS that an FSTD should have for the introduction, continuation or completion of a training task. The training accomplished on such an FSTD should be credited towards the issuance of the type rating and the training is completed to proficiency.

(2) When, in accordance with AMC5 ORA.ATO.125, determining the suitability of a training device for the execution of the applicable training tasks, the appropriate training matrix should be used.

(i) For multi-pilot aeroplanes and for single-pilot high performance complex aeroplanes:

	Manoeuvre/Procedure	Training to proficiency (TP) / Training (T)	1.Flight deck layout and structure	2. Flight controls forces & hardware	3. Flight controls systems operation	4. Aircraft systems	5. Performance & handling - On Ground	6. Performance & handling - In Ground Effect	7. Performance & Handling - Out of Ground Effect	8. Sound cues	9. Vibration cues	10. Motion cues	11. Visual cues	12. Navigation	13. Atmosphere and weather	14. Operating Sites and terrain
Section 1 – Flight preparation																
1.1	Performance calculation	TP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.2	Aeroplane external visual inspection; location of each item and purpose of inspection	TP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.3	Cockpit inspection	TP	S	R	G	S	G	N	N	N	N	N	N	N	G	N
		T	R	R	G	R	G	N	N	N	N	N	N	N	G	N
1.4	Use of checklist prior to starting engines, starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies	TP	S	R	G	S	G	N	N	R	N	N	G	S	R	G
		T	G	R	G	R	G	N	N	G	N	N	N	R	G	N
1.5	Taxiing in compliance with ATC instructions or instructions of instructor	TP	S	S	S	S	S	N	N	R	R	S	R	S	R	G
		T	G	R	R	R	R	N	N	G	N	N	R	R	G	G
1.6	Before take-off checks	TP	S	S	R	S	R	N	N	R	R	R	R	S	R	G

		T	G	G	G	R	G	N	N	G	N	N	N	R	G	N
Section 2 – Take-offs																	
2.1	Normal take-offs with different flap settings, including expedited take-off	TP	S	S	S	S	S	S	S	R	R	S	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.2	Instrument take-off; transition to instrument flight is required during rotation or immediately after becoming airborne	TP	S	S	S	S	S	S	S	R	R	S	S	S	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	R	G	G
2.3	Crosswind take-off	TP	S	S	S	S	S	S	S	R	R	S	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	R	R	N	G	G
2.4	Take-off at maximum take-off mass (actual or simulated maximum take-off mass)	TP	S	S	S	S	S	S	S	R	R	S	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.5.1	Take-offs with simulated engine failure shortly after reaching V2	TP	S	S	S	S	S	S	S	R	R	S	S	N	R	R
		T	R	R	R	R	R	R	R	G	G	R	R	N	G	G
2.5.2	Take-offs with simulated engine failure between V1 and V2	TP	S	S	S	S	S	S	S	R	R	S	S	S	S	S
		T	R	R	R	R	R	R	R	G	G	R	R	N	G	G
2.6	Rejected take-off at a reasonable speed before reaching V1	TP	S	S	S	S	S	N	N	R	R	S	S	N	R	R
		T	R	R	R	R	R	N	N	G	G	R	R	N	G	G
Section 3 – Flight manoeuvres and procedures																	
3.1	Manual flight with and without flight directors (no autopilot, no autothrust/autothrottle, and at different control laws, where applicable)	TP	R	S	S	S	N	N	S	G	R	R	R	N	G	N
		T	G	R	R	R	N	N	R	N	N	N	G	N	G	N
3.1.1	At different speeds (including slow flight) and altitudes within the FSTD training envelope	TP	R	S	S	S	N	N	S	G	R	R	R	N	G	N
		T	G	R	R	R	N	N	R	N	N	N	G	N	G	N
3.1.2	Steep turns using 45° bank, 180° to 360° left and right	TP	R	S	S	S	N	N	S	G	R	R	R	N	G	N
		T	G	R	R	R	N	N	R	N	N	N	G	N	G	N
3.1.3	Turns with and without spoilers	TP	R	S	S	S	N	N	S	G	R	R	R	N	G	N
		T	G	R	R	R	N	N	R	N	N	N	G	N	G	N
3.1.4	Procedural instrument flying and manoeuvring including instrument departure and arrival, and visual approach	TP	S	S	S	S	N	N	S	G	R	R	R	S	G	G
		T	G	R	R	R	N	N	R	N	N	N	G	R	G	G
3.2	Tuck under and Mach buffets (if applicable), and other specific flight characteristics of the aeroplane (e.g. Dutch Roll)	TP	S	S	S	S	S	S	S	G	S	S	S	S	S	S
		T	G	R	R	R	N	N	R	N	G	G	G	N	G	N
3.3	Normal operation of systems and controls engineer's panel (if applicable)	TP	R	N	N	S	N	N	N	N	N	N	N	N	G	N
		T	G	N	N	R	N	N	N	N	N	N	N	N	G	N
Section 3.4 – Normal and abnormal operations of following systems																	

3.4.0	Engine (if necessary propeller)	TP	S	S	S	S	N	N	S	R	R	R	N	N	G	N	
		T	G	G	G	R	N	N	G	G	N	N	N	N	G	N	
3.4.1	Pressurisation and air conditioning	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	
3.4.2	Pitot/static system	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	
3.4.3	Fuel system	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	
3.4.4	Electrical system	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	
3.4.5	Hydraulic system	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	
3.4.6	Flight control and trim system	TP	R	S	S	S	N	N	S	N	R	R	N	N	G	N	
		T	G	R	R	R	N	N	G	N	N	N	N	N	G	N	
3.4.7	Anti-icing/de-icing system, glare shield heating	TP	R	N	G	S	N	N	S	N	R	R	R	N	R	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	R	N	
3.4.8	Autopilot/flight director	TP	S	R	R	S	N	N	S	N	N	N	N	R	G	N	
		T	G	G	G	R	N	N	G	N	N	N	N	R	G	N	
3.4.9	Stall warning devices or stall avoidance devices, and stability augmentation devices	TP	R	R	R	S	N	N	S	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	
3.4.10	Ground proximity warning system, weather radar, radio altimeter, transponder	TP	R	R	R	S	N	N	S	N	N	N	N	N	R	R	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	R	
3.4.11	Radios, navigation equipment, instruments, FMS	TP	R	N	G	S	N	N	G	N	N	N	N	S	R	G	
		T	G	N	G	R	N	N	G	N	N	N	N	S	G	G	
3.4.12	Landing gear and brake	TP	R	S	S	S	S	S	S	R	R	R	G	N	G	G	
		T	G	R	R	R	R	R	R	G	N	N	N	N	G	N	
3.4.13	Slat and flap system	TP	R	S	S	S	S	S	S	N	N	R	N	N	G	N	
		T	G	R	R	R	R	R	R	N	N	N	N	N	G	N	
3.4.14	Auxiliary power unit (APU)	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	
Section 3.6 – Abnormal and emergency procedures																	
3.6.1	Fire drills e.g. engine, APU, cabin, cargo compartment, flight deck, wing and electrical fires including evacuation	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N	
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N	

3.6.2	Smoke control and removal	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N
3.6.3	Engine failures, shutdown and restart at a safe height	TP	S	S	S	S	N	N	S	R	R	R	N	N	G	N
		T	G	G	G	R	N	N	G	G	N	N	N	N	G	N
3.6.4	Fuel dumping (simulated)	TP	R	N	G	S	N	N	G	N	N	N	N	N	G	N
		T	G	N	G	R	N	N	G	N	N	N	N	N	G	N
3.6.5	Wind shear at take-off/landing	TP	S	S	S	S	S	S	S	R	R	S	S	S	S	S
		T	R	R	R	R	R	R	R	G	N	N	R	N	R	G
3.6.6	Simulated cabin pressure failure/emergency descent	TP	S	R	R	S	N	N	S	G	R	R	N	N	G	R
		T	G	G	G	R	N	N	R	N	N	N	N	N	G	N
3.6.7	Incapacitation of flight crew member	TP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.6.8	Other emergency procedures as outlined in the appropriate aeroplane flight manual (AFM)	TP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.6.9	TCAS event	TP	S	S	S	S	S	S	S	R	R	S	S	S	S	S
		T	G	R	R	R	N	N	G	N	N	N	N	N	G	N
Section 3.7 – Upset Prevention and Recovery																	
3.7.1	Recovery from stall events in: - take-off configuration - clean configuration at low altitude - clean configuration near maximum operating altitude - landing configuration	TP	S	S	S	S	S	S	S	R	S	S	S	S	S	S
		T	S	S	S	S	S	S	S	R	S	S	S	S	S	S
3.7.2	The following upset exercises: – recovery from nose-high at various bank angles; and – recovery from nose-low at various bank angles	TP	S	S	S	S	S	S	S	R	S	S	S	S	S	S
		T	S	S	S	S	S	S	S	R	S	S	S	S	S	S
Section 3.8 – Instrument flight procedures																	
3.8.1	Adherence to departure and arrival routes and ATC instructions	TP	R	R	R	S	N	N	R	G	N	N	N	S	R	N
		T	G	G	G	R	N	N	G	N	N	N	N	R	G	N
3.8.2	Holding procedures	TP	R	R	R	S	N	N	R	G	N	N	N	S	R	N
		T	G	G	G	R	N	N	G	N	N	N	N	R	G	N
3.8.3.1	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach procedure manually, without flight director	TP	S	S	S	S	N	N	S	R	N	N	R	S	R	G
		T	G	R	R	R	N	N	G	G	N	N	G	R	G	G

3.8.3.2	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach procedure manually, with flight director	TP	S	S	S	S	N	N	S	R	N	N	R	S	R	G
		T	G	R	R	R	N	N	G	G	N	N	G	R	G	G
3.8.3.3	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach procedure with autopilot	TP	S	S	S	S	N	N	S	R	N	N	R	S	R	G
		T	G	G	G	R	N	N	G	G	N	N	G	R	G	G
3.8.3.4	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach procedure manually, with one engine simulated inoperative during final approach, either until touchdown or through the complete missed approach procedure (as applicable), starting: (i) before passing 1 000 ft above aerodrome level; and (ii) after passing 1 000 ft above aerodrome level.	TP	S	S	S	S	S	S	S	R	R	R	S	S	R	R
		T	G	R	R	R	G	G	G	G	N	N	G	R	G	G
3.8.4	2D operations down to the MDH/A	TP	S	S	S	S	N	N	S	R	N	N	R	S	R	G
		T	G	G	G	R	N	N	G	G	N	N	G	R	G	G
3.8.5	Circling approach under the following conditions: (a)*approach to the authorised minimum circling approach altitude at the aerodrome in question in accordance with the local instrument approach facilities in simulated instrument flight conditions; followed by: (b) circling approach to another runway at least 90° off centreline from the final approach used in item (a), at the authorised minimum circling approach altitude.	TP	S	S	S	S	N	N	S	R	N	R	S	S	R	R
		T	R	R	R	R	N	N	G	G	N	N	R	R	G	R
3.8.6	Visual approaches	TP	S	S	S	S	N	N	S	R	N	R	S	N	R	R
		T	R	R	R	R	N	N	G	G	N	N	R	N	G	R
Section 4 – Missed approach procedures																	
4.1	Go-around with all engines operating during a 3D operation on reaching decision height	TP	S	S	S	S	N	N	S	R	N	S	N	S	R	G
		T	R	R	R	R	N	N	R	G	N	N	N	R	G	G
4.2	Go-around with all engines operating from various stages during an instrument approach	TP	S	S	S	S	N	N	S	R	N	S	N	S	R	G
		T	R	R	R	R	N	N	R	G	N	N	N	R	G	G
4.3	Other missed approach procedures	TP	S	S	S	S	N	N	S	R	N	S	N	S	R	G
		T	R	R	R	R	N	N	R	G	N	N	N	R	G	G
4.4		TP	S	S	S	S	N	N	S	R	R	S	N	S	R	G

	Manual go-around with the critical engine simulated inoperative after an instrument approach on reaching DH, MDH or MAPt	T	R	R	R	R	N	N	R	G	N	N	N	R	G	G
4.5	Rejected landing with all engines operating: - from various heights below DH/MDH;	TP	S	S	S	S	S	S	S	R	R	S	S	S	R	R
	- after touchdown (balked landing)	T	R	R	R	R	R	R	R	G	N	N	G	R	G	R
Section 5 – Landings																
5.1	Normal landings with visual reference established when reaching DA/H following an instrument approach operation	TP	S	S	S	S	S	S	S	R	R	S	S	S	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	R	G	R
5.2	Landing with simulated jammed horizontal stabiliser in any out-of-trim position	TP	S	S	S	S	S	S	S	R	R	S	S	S	S	S
		T	R	R	R	R	R	R	R	G	N	R	R	N	G	R
5.3	Crosswind landings (aircraft, if practicable)	TP	S	S	S	S	S	S	S	R	R	S	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	R	R	N	G	R
5.4	Traffic pattern and landing without extended or with partly extended flaps and slats	TP	S	S	S	S	S	S	S	R	R	S	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	R
5.5	Landing with critical engine simulated inoperative	TP	S	S	S	S	S	S	S	R	R	S	S	N	R	R
		T	R	R	R	R	R	R	R	G	G	R	R	N	G	R
5.6	Landing with two engines inoperative: - aeroplanes with three engines: the centre engine and one outboard engine as far as practicable according to data of the AFM; and - aeroplanes with four engines: two engines at one side	TP	S	S	S	S	S	S	S	R	R	S	S	S	S	S
		T	R	R	R	R	R	R	R	G	G	R	R	N	G	R

(ii) For helicopters:

	Manoeuvre/Procedure	Training to proficiency (TP) / Training (T)	1. Flight deck layout and structure	2. Flight controls forces & hardware	3. Flight controls systems operation	4. Aircraft systems	5. Performance & handling - On Ground	6. Performance & handling - In Ground Effect	7. Performance & Handling - Out of Ground Effect	8. Sound cues	9. Vibration cues	10. Motion cues	11. Visual cues	12. Navigation	13. Atmosphere and weather	14. Operating Sites and terrain
Section 1 – Preflight preparations and checks																
1.1	Helicopter exterior visual inspection; location of each item and purpose of inspection	TP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.2	Cockpit inspection	TP	S	R	G	S	G	N	N	N	N	N	N	N	G	N
		T	R	R	G	R	G	N	N	N	N	N	N	N	G	N
1.3	Starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies	TP	S	S	S	S	S	N	N	R	S	S	G	S	R	G
		T	R	R	R	R	R	N	N	G	N	N	G	R	G	G
1.4	Taxiing/air taxiing in compliance with ATC instructions or with instructions of an instructor	TP	S	S	S	S	S	S	N	R	R	R	R	N	R	R
		T	R	R	R	R	R	R	N	G	N	N	R	N	G	G
1.5	Pre-take-off procedures and checks	TP	S	R	R	S	R	N	N	G	G	G	R	S	R	R
		T	R	R	R	R	R	N	N	G	N	N	R	R	G	G
Section 2 – Flight manoeuvres and procedures																

2.1	Take-offs (various profiles)	TP	S	S	S	S	S	S	S	R	G	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.2	Sloping ground or crosswind take-offs & landings	TP	S	S	S	S	S	S	S	R	G	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.3	Take-off at maximum take-off mass (actual or simulated maximum take-off mass)	TP	S	S	S	S	S	S	S	R	G	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.4	Take-off with simulated engine failure shortly before reaching TDP or DPATO	TP	S	S	S	S	S	S	S	R	R	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.41	Take-off with simulated engine failure shortly after reaching TDP or DPATO	TP	S	S	S	S	S	S	S	R	R	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.5	Climbing and descending turns to specified headings	TP	S	S	S	S	N	N	S	G	G	G	G	N	R	N
		T	R	R	R	R	N	N	R	G	N	N	G	N	G	N
2.5.1	Turns with 30° bank, 180° to 360° left and right, by sole reference to instruments	TP	S	S	S	S	N	N	S	G	G	G	N	N	R	N
		T	R	R	R	R	N	N	R	G	N	N	N	N	G	N
2.6	Autorotative descent	TP	S	S	S	S	N	N	S	R	R	R	R	N	R	G
		T	R	R	R	R	N	N	R	G	N	N	R	N	G	G
2.6.1	For single-engine helicopters (SEH) autorotative landing or for multi-engine helicopters (MEH) power recovery	TP	S	S	S	S	S	S	S	R	R	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.7	Landings, various profiles	TP	S	S	S	S	S	S	S	R	R	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.7.1	Go-around or landing following simulated engine failure before LDP or DPBL	TP	S	S	S	S	S	S	S	R	R	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
2.7.2	Landing following simulated engine failure after LDP or DPBL	TP	S	S	S	S	S	S	S	R	R	R	S	N	R	R
		T	R	R	R	R	R	R	R	G	N	N	R	N	G	G
Section 3 – Normal and abnormal operations of the following systems and procedures																		
3.1	Engine	TP	S	S	S	S	S	S	S	R	G	G	G	N	G	G
		T	G	R	G	S	G	G	G	G	N	N	G	N	G	G
3.2	Air conditioning (heating, ventilation)	TP	S	N	G	S	N	N	G	N	N	N	N	N	G	N
		T	G	N	G	S	N	N	G	N	N	N	N	N	G	N
3.3	Pitot/static system	TP	S	N	G	S	N	N	G	N	N	N	G	N	R	N
		T	G	N	G	S	N	N	G	N	N	N	G	N	R	N
3.4	Fuel System	TP	S	N	G	S	N	N	G	N	N	N	N	N	G	N
		T	G	N	G	S	N	N	G	N	N	N	N	N	G	N

3.5	Electrical system	TP	S	N	G	S	G	G	G	N	N	N	G	N	G	G
		T	G	N	G	S	G	G	G	N	N	N	G	N	G	G
3.6	Hydraulic system	TP	S	S	S	S	R	R	R	N	N	N	G	N	G	G
		T	G	S	R	S	R	R	R	N	N	N	G	N	G	G
3.7	Flight control and trim system	TP	S	S	S	S	G	G	G	N	N	N	G	N	G	G
		T	G	S	R	S	G	G	G	N	N	N	G	N	G	G
3.8	Anti-icing and de-icing system	TP	R	N	N	R	N	N	G	G	G	G	N	N	R	N
		T	G	N	N	G	N	N	G	G	N	N	N	N	G	N
3.9	Autopilot/Stability augmentation devices/Flight director	TP	S	S	S	S	S	S	S	N	G	G	R	R	S	R
		T	G	R	R	R	R	R	R	N	N	N	G	R	R	R
3.10	EGPWS/HTAWS (if applicable)	TP	S	R	G	S	N	N	G	N	N	N	R	N	G	R
		T	G	G	G	R	N	N	G	N	N	N	G	N	G	R
3.11	Weather radar, radio altimeter, transponder	TP	S	N	G	S	N	N	G	N	N	N	G	N	R	R
		T	G	N	G	S	N	N	G	N	N	N	G	N	R	R
3.12	Area navigation system	TP	S	N	G	S	N	N	G	N	N	N	N	R	G	G
		T	G	N	G	S	N	N	G	N	N	N	N	R	G	G
3.13	Landing gear system	TP	S	R	R	S	R	R	R	N	G	G	R	N	G	R
		T	G	R	R	S	R	R	R	N	G	G	R	N	G	R
3.14	APU	TP	S	N	G	S	N	N	G	N	N	N	N	N	G	N
		T	G	N	G	S	N	N	G	N	N	N	N	N	G	N
3.15	Radio, navigation equipment, instruments and FMS	TP	S	N	G	S	N	N	G	N	N	N	N	S	G	G
		T	G	N	G	S	N	N	G	N	N	N	N	R	G	G
Section 4 – Abnormal and emergency procedures																	
4.1	Fire drills (including evacuation if applicable)	TP	S	S	S	S	S	S	S	N	N	N	R	N	G	R
		T	S	R	R	S	R	R	R	N	N	N	R	N	G	R
4.2	Smoke control and removal	TP	S	N	G	S	N	N	G	N	N	N	R	N	G	R
		T	S	N	G	S	N	N	G	N	N	N	R	N	G	R
4.3	Engine failures, shutdown and restart at a safe height	TP	S	S	S	S	N	S	S	R	R	R	R	G	G	R
		T	R	R	R	S	N	G	G	G	G	G	G	G	G	R
4.4	Fuel dumping (simulated, if applicable)	TP	R	N	G	R	N	N	G	N	N	N	N	N	G	N
		T	G	N	G	G	N	N	G	N	N	N	N	N	G	N
4.5	Tail rotor control failure (if applicable)	TP	R	S	S	S	R	S	S	N	G	S	S	N	G	R
		T	G	R	R	R	R	R	R	N	G	R	R	N	G	R

4.5.1	Tail rotor loss (if applicable)	TP	R	S	S	S	R	S	S	G	R	S	S	N	G	R
		T	G	R	R	R	R	R	R	N	G	R	R	N	G	R
4.6	Incapacitation of crew member – only for MPH and SPH operated in MPO	TP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.7	Transmission malfunctions	TP	S	S	S	S	R	R	R	G	G	G	R	N	G	G
		T	R	R	R	R	R	R	R	G	G	G	G	N	G	G
4.8	TCAS event (if applicable)	TP	S	R	G	S	N	N	G	N	N	N	R	N	G	N
		T	G	G	G	R	N	N	G	N	N	N	N	N	G	N
4.9	Other emergency procedures as outlined in the appropriate flight manual	TP	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Section 5 – Instrument flight procedures (to be performed in IMC or simulated IMC)																
5.1	Instrument take-off: transition to instrument flight is required as soon as possible after becoming airborne	TP	S	S	S	S	N	S	S	G	R	R	R	S	R	G
		T	R	R	R	R	N	R	R	G	N	N	R	R	G	G
5.1.1	Simulated engine failure during departure	TP	S	S	S	S	N	S	S	G	R	R	R	S	R	G
		T	R	R	R	R	N	R	R	G	N	N	G	R	G	G
5.2	Adherence to departure and arrival routes and ATC instructions	TP	R	R	R	S	N	N	R	G	N	N	N	S	R	N
		T	G	G	G	R	N	N	G	G	N	N	N	R	G	N
5.3	Holding procedures	TP	R	R	R	S	N	N	R	G	G	G	N	S	R	N
		T	G	G	G	R	N	N	G	G	N	N	N	R	G	N
5.4.1	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach, manually, without flight director	TP	S	S	S	S	N	N	R	G	N	N	G	S	R	G
		T	R	R	R	R	N	N	G	G	N	N	G	R	G	G
5.4.2	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach, manually, with flight director	TP	S	S	S	S	N	N	R	G	N	N	G	S	R	G
		T	R	R	R	R	N	N	G	G	N	N	G	R	G	G
5.4.3	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach, with coupled autopilot	TP	S	R	R	S	G	R	R	G	N	N	G	S	R	G
		T	R	G	G	R	G	G	G	G	N	N	G	R	G	G
5.4.4	3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach, manually, with one engine simulated inoperative; engine failure has to be simulated during final approach before passing 1000 ft above aerodrome level until touchdown or until completion of the missed approach procedure	TP	S	S	S	S	N	N	R	G	R	R	S	S	R	R
		T	R	R	R	R	N	N	G	G	N	N	R	R	G	G
5.5	2D operations down to the MDA/H	TP	S	S	S	S	N	N	R	G	N	N	G	S	R	G
		T	R	R	R	R	N	N	G	G	N	N	G	R	G	G

5.6	Go-around with all engines operating on reaching DA/H or MDA/MDH	TP	S	S	S	S	N	N	R	G	R	R	G	S	R	G	
		T	R	R	R	R	N	N	G	G	N	N	G	R	G	G	
5.6.1	Other missed approach procedures	TP	S	S	S	S	N	N	R	G	R	R	G	S	R	G	
		T	R	R	R	R	N	N	G	G	N	N	G	R	G	G	
5.6.2	Go-around with one engine simulated inoperative on reaching DA/H or MDA/MDH	TP	S	S	S	S	N	N	R	G	R	R	G	S	R	G	
		T	R	R	R	R	N	N	G	G	N	N	G	R	G	G	
5.7	IMC autorotation with power recovery	TP	S	S	S	S	N	N	R	G	R	R	R	N	G	N	
		T	R	R	R	R	N	N	G	G	N	N	R	N	G	N	
5.8	Recovery from unusual attitudes manually and, if applicable, with auto recovery mode	TP	S	S	S	S	N	N	R	G	R	R	N	N	G	N	
		T	R	R	R	R	N	N	G	G	N	N	N	N	G	N	

(b) Training considerations

(1) The FSTD Capability Signatures (FCS) included in the training matrices are meant to provide an acceptable mean of compliance with respect of the provisions of Appendix 9, Section A, point 1f and to receive training credit towards the minimum FSTD training hours specified in the relevant type rating training programme. The training matrices have been determined by analysing, for each training task, the training requirements of a type rating training course for the relevant category of aircraft. Additionally, the technical requirements for each fidelity level assigned to a feature have been analysed to ensure that they are sufficient to satisfy the identified training needs. Such analysis evaluates each training task independently from the others. However, the FCS in the training matrices are not meant to be used in isolation but should be used to support the design of a training programme in accordance with AMC5 ORA.ATO.125(b).

(2) The evaluation of the fidelity levels assigned to each feature takes into consideration the requirements of a type rating training course syllabus. Additional requirements for specific trainings have not been evaluated. Organisations that provide training in accordance with Regulation (EU) No 965/2012 for operations that require specific approval should carefully evaluate the fidelity levels required for the relevant features of an FSTD to be used for certain training tasks, taking into consideration the information presented in the qualification certificate of the FSTD and in the equipment specifications list.

Additional information regarding the technical capability of an FSTD can be found in Subpart B of CS-FSTD.

(3) At TP level, the ‘Flight Deck Layout and Structure’ feature should have tactile hardware, unless the specific aircraft type is equipped with touchscreen devices for specific aircraft systems.

At T level, the ‘Flight Deck Layout and Structure’ feature may be a touchscreen representation, except when manual flying is required.

(4) In case of training tasks or subtasks that have an influence on or should be executed in conjunction with other training tasks, the FSTD Capability Signatures of such training tasks should be combined in the manner described in point (b)(3) of AMC5 ORA.ATO.125.

(5) For aeroplane training tasks included in Section 3.4 and Section 3.6 of the table in point (a)(2)(i), and for helicopter training tasks included in Section 3 and Section 4 of the table in point (a)(2)(ii), the fidelity level for the ‘Aircraft Systems’ feature indicates the minimum fidelity level for the relevant aircraft systems that should be required to perform the training task. Aircraft systems other than those relevant to perform such tasks may be at a different fidelity level, provided that this difference does not lead to have any negative training.

(6) At T level, the FCS for aeroplane training tasks included in Section 3.4 and Section 3.6 of the table in point (a)(2)(i) show a ‘Representative’ (R) fidelity for the ‘Aircraft Systems’ feature. In case an aircraft type shows significant differences between variants for certain aircraft systems, training providers should consider selecting a ‘Specific’ (S) fidelity level for the ‘Aircraft Systems’ feature.

(7) For aeroplane training tasks 3.6.7 and 3.6.8 of the table in point (a)(2)(i) and helicopters training tasks 4.6 and 4.9 of the table in point (a)(2)(ii), an FCS has not been determined. When designing a type rating training programme in accordance with AMC5 ORA.ATO.125, the suitability of the FSTD used for the training of such tasks should be assessed taking into consideration the specific training needs.

(8) Take-off and landing training tasks have, except for aeroplane training task 2.2 of the table in point (a)(2)(i), a 'Not Applicable' (N) fidelity level for the 'Navigation' feature, as take-offs and landings are performed visually. However, in most cases, especially at TP level, such training tasks are followed by instrument departures or executed following an instrument arrival and approach procedure. In such cases, when combining different training tasks as per point (b)(5), the FCS for take-off and landing training tasks should be combined with those of the relevant instrument departure or instrument arrival and approach procedures, and the highest resulting fidelity level for the 'Navigation' feature should be taken.

(9) In general, motion and vibration cues should not be required for instrument flight procedures, as it is assumed that the scope of the training tasks is focused on the correct execution of the instrument flight procedures and not on the cues experienced by the flight crew. However, for specific training tasks which require dynamic manoeuvring and significant changes of aircraft attitude, such as, for aeroplanes, one engine simulated inoperative procedures, or circling and visual approaches, motion cues and, where needed, vibration cues, should be required.

Rationale

AMC3 to Appendix 9 introduces the training matrices in Regulation (EU) No 1178/2011 to enable the application of the 'task-to-tool' concept.

Point (a)(1) defines what is a training matrix and the meaning of 'training' (T) and 'training-to-proficiency' (TP).

Point (a)(2) explains that the appropriate training matrix for the relevant category of aircraft should be used during the design of the training programme.

Point (b) provides important training considerations that should be followed for the design of a type rating training course using a training matrix (see AMC5 ORA.ATO.125(b)).

Point (b)(1) explains that the training matrices are a way to comply with the provisions of Appendix 9, Section A, point 1 when used in accordance with AMC5 ORA.ATO.125, and the principles followed to determine the training matrices.

Point (b)(2) clarifies that in case of training for operations that requiring specific approval in accordance with Regulation (EU) 965/2012, the evaluation of the fidelity levels for assigned for certain training tasks should be evaluated. For example, in case of training for low visibility operations, according to the requirements of Subpart B of CS-FSTD, the 'Operating Sites And Terrain' feature should be at least at representative 'R' fidelity level.

Point (b)(3) provides information on the suitable technology for the 'Flight Deck Structure And Layout' feature, which depends on the minimum FCS considered (T or TP) and the nature of the training tasks.

Point (b)(4) explains that FCS of different training tasks should be combined when such training tasks have an influence on the others. The method is described in AMC5 ORA.ATO.125(b)(3).

Point (b)(5) explains that the fidelity level of the 'Aircraft Systems' feature for certain a training task should only be required for the relevant aircraft system(s) in the execution of such task. Other non-relevant systems for the execution of such training task may be at a different fidelity level.

Point (b)(6) explains that the fidelity for the 'Aircraft Systems' feature at T level should be increased in the case of variants of an aeroplane type which show significant differences. Indeed, according to the requirements of CS-FSTD and to the information provided in GM2 to Appendix 9, a representative 'R' fidelity level refers to an aircraft type, while a specific 'S' fidelity level refers to an aircraft type and variant.

The suitability of an FSTD should be ensured in accordance with the provisions of point ORA.ATO.135 in case of training tasks for which an FCS has not been assigned (point(b)(7)).

The FCS of take-off and landing training tasks, when executed in combination with an instrument departure, arrival or approach, should be combined with the FCS of such training tasks and have a fidelity level different from 'N' for the 'Navigation' feature (point(b)(8)).

Point (b)(9) explains the reason why motion and vibration cues are not required for the majority of training tasks and the cases in which such cues should be required.

GM1 to Appendix 9 Training, skill test and proficiency check for MPL, ATPL, type and class ratings, and proficiency check for IRs

RMT.0196

TYPE SPECIFIC UPRT AND GO-AROUND TRAINING IN FSTD

[...]

(b) Stall event recovery in FSTD (Appendix 9, Section B(5) exercise 7.2.1; Section B(6) exercise 3.7.1)

(1) It is of utmost importance that stall event recovery training takes into account the capabilities of the FFS used. To deliver stall event recovery training, the FFS should be qualified against the relevant UPRT elements of CS-FSTD(A) Issue 2 or CS-FSTD. Stall event recovery training should include training up to the stall (approach-to-stall). Post-stall training may be delivered provided the device has been qualified against the relevant optional elements of CS-FSTD(A) Issue 2 or CS-FSTD and the operator demonstrates that negative training or negative transfer of training is avoided. A 'stall event' is defined as an occurrence whereby the aeroplane experiences one or more conditions associated with an approach to-stall or a post stall.

[...]

[...]

Rationale

Since only the new CS-FSTD will be applicable for newly qualified FSTDs, the proposal to amend GM1 to Appendix 9 specifies that, depending on the qualification basis of the FSTD, the relevant applicable UPRT elements may either be in CS-FSTD(A) Issue 2 or in CS-FSTD.

GM2 to Appendix 9 Training, skill test and proficiency check for MPL, ATPL, type and class ratings, and proficiency check for IRs

RMT.0196

FSTD FEATURES AND FIDELITY LEVELS

(a) This guidance material provides information on the FSTD Simulation Features and fidelity levels that form an FSTD Capability Signature (FCS), as described in Appendix 9 to Annex I (Part-FCL).

(b) 'FSTD simulation features' means the domain of simulation which, when used together with the fidelity levels, create an FSTD Capability Signature (FCS). The fourteen features are categorised in three groups.

(1) Aircraft simulation comprising the following simulation features:
1. Flight Deck Layout And Structure
2. Flight Controls Forces & Hardware
3. Flight Controls Systems Operation
4. Aircraft Systems
5. Performance & Handling - On Ground
6. Performance & Handling - In Ground Effect
7. Performance & Handling - Out of Ground Effect

(2) Cueing simulation comprising the following simulation features:
8. Sound Cues
9. Vibration Cues
10. Motion Cues
11. Visual Display Cues

(3) Environment simulation comprising the following simulation features:
12. Navigation
13. Atmosphere And Weather
14. Operating Sites And Terrain

(c) An FCS feature required to support any given training task can be assigned one of the four following feature fidelity levels as summarised below:

(1) Specific (S)

Feature that replicates a particular variant of an aircraft type and/or operating environment.

(2) Representative (R)
Feature with the characteristics of an aircraft type and/or operating environment.

(3) Generic (G)
Feature with the characteristics of an aircraft class or group and/or operating environment.

(4) Not Applicable (N)
Feature that is not required or reserved for future use.

(d) These 4 fidelity levels can then be summarised for each of the feature categories as described in the following.

(1) S = Specific: The highest level of required fidelity for an FSTD feature.

(i) Aircraft Simulation
Replicates the specific aircraft type appearance, tactile feel, performance and handling qualities in all phases of flight. The simulation is based on type specific aircraft data. Validated objectively by comparing the device performance and handling qualities against flight test based validation data for the specific aircraft type.

(ii) Cueing Simulation
Replicates the specific aircraft type sound, motion/vibration cueing, real-world visual environment and perspective cues, to the maximum extent possible within current physical simulation limitations. Validated objectively by comparing the device cueing characteristics against flight test based validation data for the specific aircraft type.

(iii) Environment Simulation
Replicates the complete real-world environment to support the simulation and training, as required to meet training objectives, for any specific location.

(2) R = Representative: The intermediate level of required fidelity for an FSTD feature.

(i) Aircraft Simulation
Similar to, or represents, an aeroplane type or helicopter type for appearance, tactile feel, performance and handling qualities in all phases of flight. It should be based on one aircraft type. Validated objectively by comparing the device against data for the aircraft for correct trend and magnitude. May be complemented by subjective tuning or development.

(ii) Cueing Simulation
Aircraft sound, motion/vibration cueing, real-world visual environment and perspective cues that are similar to the aircraft. Validated by initially subjectively tuning the device cues to establish a baseline for recurrent evaluation.

(iii) Environment Simulation
Simulation of the real-world environment focused on the requirements of the training objectives.

(3) G = Generic: The lowest level of required fidelity for an FSTD feature.

(i) Aircraft Simulation

Appearance, tactile feel, performance and handling qualities in all phases of flight that are characteristic of an aeroplane class or helicopter group. May be based on multiple data sources of different aircraft within an aeroplane class or helicopter group. Subjective evaluation against available data to show that it is within correct trend and magnitude of the aircraft or its class/group to establish a baseline for recurrent evaluation.

(ii) Cueing Simulation

Simple modelling of key basic cueing features. Where cueing is present, it demonstrates the generic characteristics of an aeroplane class or helicopter group. Generic visual environment with perspective sufficient to support basic instrument flying and transition to visual from straight-in instrument approaches.

(iii) Environment Simulation

Simple modelling of key basic environment features.

(4) N = Not Applicable: The FSTD feature is not required to be simulated.

(i) All

Features are not evaluated. If a feature is installed, but is not required, it shall not be distracting or detract from the other features for the intended use of the device.

(e) Further information regarding the description of the features and fidelity levels can be found in Subpart B of CS-FSTD.

Rationale

The new GM2 to Appendix 9 provides guidance regarding the features and the fidelity levels that constitute the FSTD Capability Signature of an FSTD. This is essential information for the user of the training matrices to understand the composition of the matrices and the relation between the training tasks, the FSTD features and the required fidelity levels for both training (T) and training-to-proficiency (TP) levels of a task. Furthermore, this information is important to understand the meaning of the FSTD Capability Signature reported on the qualification certificate of an FSTD and to properly use the device in training.

AMC2 ARA.GEN.200(a)(2) Management system

QUALIFICATION AND TRAINING - INSPECTORS

[...]

(2) Additional qualification criteria:

[..]

(vi) for qualification of FSTD inspectors, the competent authority should develop a training programme to prepare the inspectors to perform their tasks and to demonstrate competencies as appropriate to their role. Technical FSTD inspector should hold a qualification as defined in point (a)(1) of AMC2 ARA.FSTD.100(a);(b);(c). FSTD flight inspector should hold a qualification as defined in point (a)(2) of AMC2 ARA.FSTD.100(a);(b);(c).

[...]

GM4 ARA.GEN.200(a)(2) Management system

QUALIFICATION AND TRAINING - FSTD INSPECTORS

(a) Qualification

(1) FSTD inspectors should have knowledge and experience relevant for the FSTD domain in the following areas: flight mechanics and aerodynamics, image generation systems, electronics/avionics, computer programming, aircraft systems and structures, methods of simulation, flight training and methods, flight operations and methods.

(2) When designing the training programme for qualification of an FSTD inspector, it is recommended that the FSTD inspectors acquire the following competencies which can be demonstrated through following observable behaviors:

FSTD inspectors' competencies	Description of the competency	Observable behaviour in FSTD domain
Theoretical knowledge	Basic knowledge and understanding of flight simulation	Demonstrates the appropriate level of understanding of the following FSTD features/systems and their integration: — motion-cueing system; — hardware (e.g. architecture, real/simulated parts, interface, host);

		— visual (e.g. image generation, projectors, optics, collimated/direct projection); — software (e.g. basics, re-hosted/retargeted avionics, binary- and loadable-software aircraft part solutions) and configuration control processes; — databases (e.g. types and correlation); — flight controls/control loading (e.g. passive/active, reversible/non-reversible); — sound-cueing system (e.g. limitations, subjective/objective); — modelling of aircraft performance and handling characteristics; — validation data and validation data roadmaps; and — aeroplane system modelling and data package types.
Regulatory knowledge	Understanding and application of regulation and procedures	Demonstrates the appropriate level of understanding and application of the following: — concept and basis of applicable primary reference documents; — all applicable regulations (e.g. Regulation (EU) No 2018/1139, Annex VI (Part-ARA)/Annex VII (Part-ORA) to Regulation (EU) No 1178/2011; — internal work instructions; — guidance material on industry best practices (e.g. RAeS, ARINC, and ICAO publications[1]).
Teamwork skills	Leading and management of the oversight process	Demonstrates appropriate teamwork ability in the following: — oversight preparation; — organising evaluation/audit processes and resources; — briefing and debriefing; and — task allocation.
FSTD operations	Knowledge of FSTD acceptance process and operations	Demonstrates the appropriate level of understanding and application of the following: — acceptance and testing processes; — additional equipment (at FSTD qualification level or FCS, as applicable); — modifications of FSTD; — maintenance; — performance metrics.
FSTD usage	Knowledge of FSTD use in pilot training	Demonstrates the appropriate level of understanding of the following: — FSTD as part of an approved training course; — credits vs different FSTD qualification levels (for legacy FSTD); — FSTD training, testing and checking considerations; — air operations and flight crew implications for FSTDs.

[1] Royal Aeronautical Society, Aeronautical Radio Incorporated, and International Civil Aviation Organization, respectively.

FSTD evaluation	Understanding and application of FSTD evaluation components	Demonstrates the appropriate level of understanding and balanced application of the following: — QTG/objective testing; — functional/subjective testing; — engineering judgement; — proportionate decision-making; — additional training considerations; and — categorisation of findings, non-compliances of FSTD.
Management system	FSTD qualification certificate holder's CMS manual assessment and auditing	Demonstrates the appropriate level of understanding and application of the following: — assessment of the management system (compliance monitoring system (CMS), safety management system (SMS), organisation management system); — auditing techniques; and — what is expected from the FSTD operator's processes.

(b) Initial training of FSTD inspectors

(1) In order to ensure that FSTD inspectors are competent in the domains they will be working on, the competent authorities should take into account the following principles in the initial training of the FSTD inspectors:

(i) the training details (e.g. on objective testing, functions and subjective testing) should be differentiated between aircraft categories (e.g. aeroplane, rotorcraft, VTOL) ;

(ii) additional competency is required when evaluating specific areas related to special training considerations such as PBN, UPRT, full stall, HUGS, EVS, helicopter special scenarios, etc.

(iii) the number of audits/evaluations in which the trainee should participate as an observer and as a trainee team member under supervision before acting as a full audit/evaluation team member. The total number of audits/evaluations as a trainee should be determined based on the trainee's development progress.

(iv) the training under supervision should incorporate hands-on evaluation training in FSTD.

(2) Any appropriate training methods such as lectures or self-study may be used. It is recommended that the trainers of FSTD inspectors have extensive experience in their areas of instruction and adequate pedagogic skills.

(3) Guidance on the training topics is provided in Table 1 below. The purpose of each training topic is to establish a certain level of competency, which the inspectors need in order to perform their tasks.

Table 1 — Indicative list of training topics relevant for the FSTD inspectors, performing FSTD evaluations and/or audits of organisations operating FSTD

Area of training	Key learning points
(a) International aviation safety and regulation environment	(1) Chicago Convention on International Civil Aviation and ICAO Annexes and Documents; (2) European Union (EU) regulations; and (3) EASA AMC/GM
(b) Applicable primary reference documents (PRDs)	(1) History and generation of PRDs; and (2) Notable differences between different PRDs.
(c) CS-FSTD	(1) Structure; (2) Main contents; (3) Definitions of FSTD type/levels or FSTD with FCS, as applicable; and (4) FSTD interim qualification.
(d) FSTD cueing	(1) Human aspects; (2) Human self-motion perception; (3) Technology and ways to create and combine cues in FSTDs; (4) Positive and negative transfer of training.
(e) Computing and real-time simulation	(1) History; (2) Limitations; (3) Simulation loop; (4) Host computer; (5) Nodes; and (6) Latency/transport delay.
(f) FSTD common hardware solutions	(1) Computer architecture; and (2) Control loading systems.
(g) Visual system	(1) History of visual systems; (2) Different projection types; (3) Image generation; (4) Visual-database creation; (5) Visual-system geometry; (6) Requirements for different FSTD qualification levels or for FSTD with FCS, as applicable; (7) Objective visual tests.
(h) Motion system	(1) Degrees of freedom; (2) Generation of motion cues; (3) Limitations; (4) Motion algorithms; (5) Fast Fourier-transformation; and (6) Power spectral density.
(i) Avionics simulation	(1) For generic FSTDs, acceptable system characteristics as in CS-23, CS-25, CS-27, and CS-29; (2) Reference documents for avionics (e.g. aircraft flight manual (AFM), flight crew operating manual (FCOM), data package); (3) Concept of re-hosting;

Area of training	Key learning points
	(4) Use of real avionics boxes; (5) Use of simulated avionics; (6) Pros and cons of different solutions; (7) Simsoft (Aeronautical Radio Incorporated (ARINC) 610); (8) Control system operation.
(j) Navigation systems and their simulation	(1) Principles of common navigation systems operation (e.g. INS, VOR, , DME, ILS, GNSS, etc.); (2) Principles of common interfaces of different generations (e.g. GNSS, FMS, integrated avionics suites, etc.); (3) Simulation of navigation data; (4) Performance-based navigation (PBN) procedures and required equipment.
(k) Flight operations in different aircraft	(1) Theoretical parts of pilot type course (e.g. computer-based training) of at least two different aircraft types (e.g. turboprop and jet); (2) Flight training to gain understanding of instrument flight rules (IFR) procedures and multi-engine handling (note: not necessarily targeted for a pilot licence).
(l) Simulation of aerodynamics and engines	(1) Simulation loop; (2) Limits of models; (3) Upset simulation and exceedance of simulated envelope; and (4) Aircraft stability and associated provisions of CS-23, CS-25, CS-27, and CS-29.
(m) Validation data	(1) Data gathering; (2) Validation data roadmap (VDR) concept, approval and management of updates; (3) Data package; (4) Data acceptance; (5) Operational suitability data (OSD); (6) CS-SIMD; (7) Proof of match; (8) Use of engineering data; (9) Alternative engine/avionics data; and (10) Concepts of generic data and footprints.
(n) Qualification test guide (QTG)	(1) History of QTG testing; (2) Text part of QTG; (3) Master QTG (MQTG) and its revisions; (4) Concept of validation; (5) Tolerances; (6) QTG testing process; (7) Integrated testing; (8) Differences between automatic and manual testing; (9) Exercises; (10) Typical problems; (11) Use of open- and closed-loop controllers; and (12) Purpose of each individual QTG test.
(o) Functions and subjective testing	(1) Requirements; (2) Methods for effective testing; (3) Team cooperation; (4) Reference documents (e.g. AFM, FCOM, POH etc.);

Area of training	Key learning points
	(5) Malfunctions testing; (6) What to expect from generic FSTDs i.e. characteristics of different aircraft classes; (7) Purpose and testing methods of each individual test required by CS-FSTD; and (8) Additional training considerations (e.g. UPRT and stall recovery, RNP AR, HUGS, etc.).
(p) FSTD evaluation, qualification, and their processes	(1) Initial, recurrent and special evaluations; (2) Documentation; (3) Dossier; (4) How to keep evaluation as objective as possible; (5) Team cooperation; (6) Conducting all the phases of the evaluation and qualification processes; (7) Classification and management of findings; (8) Content, language and form of the certificate and evaluation report; (9) Maintaining the FSTD qualification; and (10) Updates and upgrades.
(q) Training, testing and checking credits	(1) Overview of credits granted by Annex I (Part-FCL) to Regulation (EU) No 1178/2011 and Subpart FC of Annex III (Part-ORO) to Regulation (EU) No 965/2012 ; (2) OSD reports.
(r) Internal organisational procedures and work instructions of the competent authority	(1) Applicable processes; (2) Use of documents.
(s) Soft skills	(1) Communication skills; (2) Conflict management; (3) Teamwork; (4) Time management; and (5) Human factors (HF).
(t) Ability to exercise proper judgement	(1) Justification of findings (i.e. always based on evidence and documentation, such as requirements, or on operator manuals (OMs), but not on personal preferences); (2) Engineering judgement; and (3) Examples of different kind of problems that can be encountered, as well as findings of different levels and basis for their classification.
(u) Expectations of FSTD OMs	(1) Requirements concerning FSTD OMs, (2) Ways of presenting a process (e.g. text, checklists or flow process charts indicating when, how, and by whom something is performed).
(v) Auditing process and general auditing methods and procedures	(a) Concept and definitions of process, audit and inspection (please refer to GM3 ORA.GEN.200(a)(6)); (b) 'General' auditing procedures and methods; e.g. preparation, conduction (interviewing, documentations practices, etc.), reporting, follow-up and closure of an audit; and

Area of training	Key learning points
(w) Understanding the operation, management and maintenance of FSTD	(1) QTG management process: (i) annual test plan; (ii) approval of results; (iii) actions in case of failed test; (iv) MQTG and its revisions; (v) subjective testing process; (vi) functions testing process; (vii) annual test plan; (viii) used documentation; (ix) contents of fly-out vs PRDs; (2) Reliability analysis: (i) measured indicators; (ii) targets for indicators; (3) Personnel training: initial and recurrent training; (4) Safety instructions for personnel and users; (5) Preventive maintenance: (i) program contents; and (ii) revisions to the programme as needs for change are identified; (6) Configuration control system: (i) management of software, hardware and database changes (e.g. planning, specification, development, acceptance, documentation); (ii) practices to test the integrity of an FSTD; and (iii) software backups; (7) Defect rectification (i.e. 'snag' handling): (i) how users can report defects; (ii) how users are notified of open defects; and (iii) prioritisation of defects; (8) Spare parts and tools management: (i) management of spares; (ii) how disconnected parts are managed; and (iii) calibration and checks of applicable tools; (9) Document control and logs: (i) archiving of documents; (ii) retention periods; (iii) management of document versions (e.g. manuals, logs, instructions, etc.); and (iv) applicable logs; (10) Compliance monitoring: (i) monitoring of regulatory updates; (ii) planning; (iii) internal audits; (iv) internal inspections; (v) auditors; (vi) management of findings; (vii) root cause analysis; (viii) measurement of effectiveness and continuous improvement; and (ix) reporting to the competent authority; and (11) Safety management system (SMS):

Area of training	Key learning points
	(i) recognition and management of risks; (ii) mitigation of negative training; (iii) cooperation between the organisation operating the FSTD and the users.

(c) Continuing competence and recurrent training for FSTD inspectors

(1) In order to ensure an acceptable level of practical experience and the retention of the appropriate skills, the inspectors should have recent experience of FSTD evaluations and audits. If needed, refreshment training should be provided before acting as a full team member. The competent authority should ensure that the inspectors remain competent in oversight activities, and recurrent training should be focused on that aspect as well.

(2) The recurrent training should concentrate at least on the following areas:

(i) areas where an FSTD inspector needs improvement;
(ii) new FSTD and aircraft technologies;
(iii) changes to rules affecting the FSTD domain.

(3) Some or all of the below-presented methods may be used for recurrent training:

(i) in-house training;
(ii) self-study (professional literature and/or magazines);
(iii) web-based training courses;
(iv) participation in FSTD conferences.

(d) Documentation to be kept as records in support of training of FSTD inspectors include the training programme developed by the authority for qualification of FSTD inspectors, the records of performed initial and recurrent training of the inspectors and any amendments to these documents.

Rationale:

The amendment to the AMC2 ARA.GEN.200(a)(2) and the new GM4 ARA.GEN.200(a)(2) are developed based on the NPA 2017-13 proposal for qualification and training of FSTD inspectors. The rationale is that the current rules are not detailed enough regarding the qualification of FSTD inspectors and required competency.

Considering the comments to the NPA 2017-13 and the need to clarify the expected qualification and scope of initial and recurrent training for the FSTD inspectors, it is suggested that:

1. the AMC2 ARA.GEN.200(a)(2) introduces a new point (a)(2)(vi) to address specifically the criteria for qualification of the FSTD inspectors and in particular those for the FSTD technical inspector (TI) and the FSTD flight inspector (FI). The qualification to these inspectors is already defined in AMC ARA.FSTD.100(a);(b);(c) and therefore a reference to this point is made. In addition, the amended

AMC2 ARA.GEN.200(a)(2) clarifies the obligation for the competent authorities to develop a training programme for the FSTD inspectors to prepare them to perform their tasks and to demonstrate competencies as appropriate to their role.

2. new GM4 ARA.FSTD.200(a)(2) clarifies the expected competencies which the FSTD inspectors should demonstrate and the scope of the initial and recurrent training for the FSTD inspectors.

The GM is developed based on the feedback to NPA 2017-13, where several stakeholders voiced the need that provisions for FSTD inspector qualification and training are proportionate to the competent authorities' resources. Hence, EASA proposes that the competency framework for the FSTD inspectors is defined only at GM level, providing guidance and recommendation to the qualification/scope of the training for the inspectors. The GM is also aimed at enabling standardisation of FSTD inspectors across the competent authorities.

AMC~~2~~1 ARA.FSTD.100(a);(b);(c) Evaluation procedure

RMT.0196

GENERAL

(a) During ~~initial and recurrent~~ FSTD evaluations ~~it should be necessary for~~ the competent authority should ~~to~~ conduct an appropriate sample of the objective, functions and subjective tests ~~described in Part-ORA and~~ detailed in the ~~CS-FSTD(A) and CS-FSTD(H), as~~ applicable PRD. ~~There may be occasions when all tests cannot be completed – for example during recurrent evaluations on a convertible FSTD – but arrangements should be made for all tests be completed within a reasonable time.~~

(b) The competent authority should review an appropriate sample of results of the objective, functions and subjective tests conducted by the organisation operating the FSTD in accordance with point ORA.FSTD.105 (a)(2) and (3). ~~Following an evaluation, it is possible that a number of defects are identified. Generally, these defects should be rectified and the competent authority notified of such action within 30 days. Serious defects, which affect flight crew training, testing and checking, could result in an immediate downgrading of the qualification level I. If any defect remains unattended without good reason for a period greater than 30 days, subsequent downgrading may occur or the FSTD qualification could be revoked.~~

(c) For the evaluation of an FSTD the standard form as mentioned in AMC~~5~~1 ARA.FSTD.100(~~a~~d)~~(1)~~ should be used.

Rationale:

The new AMC1 ARA.FSTD.100(a);(b);(c) is based on the AMC2 ARA.FSTD.100(a)(1). The title of the AMC is changed to cover all evaluation procedures which are in the scope of ARA.FSTD.100.

The changes in point (a) relates to the amended scope of ARA.FSTD.100 to include any evaluation procedures. The authority should always do a sample of objective, functions and subjective tests, but based on the type of evaluation its scope could be changed (for example, in case of an FSTD modification and depending on the nature of the modification, the sample could be limited to functions and subjective tests only). Therefore, the wording “appropriate sample of objective, functions and subjective tests” is used.

Point (b) addresses that the authority reviews the results of the tests performed by the organisation operating the FSTD. The text which is proposed to be deleted is now in the hard law ARA.FSTD.100(e). The term “downgrading” is not used anymore due to introduced changes in point ARA.FSTD.130.

AMC~~4~~2 ARA.FSTD.100(a);(b);(c) ~~Initial~~ E~~e~~valuation procedure

RMT.0196

COMPOSITION OF THE EVALUATION TEAM

(a) The competent authority should appoint a technical team to evaluate an FSTD in accordance with a structured routine ~~in accordance with a structured routine~~ to gain or maintain a qualification ~~level~~. The team should ~~normally~~ consist of at least the following personnel:

(1) A technical FSTD inspector ~~of the competent authority, or an accredited inspector from another competent authority,~~ qualified in ~~all~~ aspects of flight simulation hardware, software and methods of simulation with an aviation engineering degree or equivalent ~~computer modelling or, exceptionally, a person designated by the competent authority with equivalent qualifications,~~ and

(2) ~~One of the following:~~

~~(i) a flight inspector of the competent authority, or an accredited inspector from another competent authority, who is qualified in flight crew training procedures and holds a valid type rating on the aeroplane/helicopter (or for flight navigation procedures trainer (FNPT) and basic instrument training device (BITD), class rated on the class of aeroplane/type of helicopter) being simulated; or~~

~~(ii) a flight inspector of the competent authority who is qualified in flight crew training procedures, assisted by a type rating instructor holding a valid type rating on the aeroplane/helicopter (or for FNPT and BITD, class rated on the class of aeroplane/type of helicopter) being simulated; or, exceptionally,~~

~~(iii) a person designated by the competent authority who is qualified in flight crew training procedures and holds a valid type rating on the aeroplane/helicopter (or for FNPT and BITD, class rated on the class of aeroplane/type of helicopter) being simulated and sufficiently experienced to assist the technical team. This person should fly out at least part of the functions and subjective test profiles.~~

An FSTD flight Inspector who holds or has held an instructor certificate and:

(i) holds or has held a type/class rating on the aircraft being simulated; or

(ii) is assisted by a person from the organisation operating the FSTD as referred in point (a) to AMC1 ORA.FSTD.100(a) to support the evaluation team.

~~(3) Where a designee is used as a substitute for one of the competent authority's inspectors, the other person shall be a properly qualified inspector of the competent authority or an accredited inspector from another Member State's competent authority.~~

(b) The FSTD technical Inspector and/or the FSTD flight inspector may be staff of the competent authority performing the evaluation or accredited inspector(s) from another competent authority or exceptionally, person(s) designated by the competent authority with equivalent qualifications to each inspector as referred in point (a). Where a designee is used as a substitute for one of the competent authority's inspectors, the other person shall be a properly qualified inspector of the competent authority or an accredited inspector from another competent authority.

(c) In case an FSTD inspector has not participated in an FSTD evaluation in the last three years, such inspector should undergo recency training.

~~(b) For a flight training device (FTD) level 1 and FNPT Type I, one suitably qualified inspector may combine the functions in (a)(1) and (a)(2).~~

~~(c) For a BITD this team should consist of an inspector from a competent authority and one from another competent authority, including the manufacturer's competent authority, if applicable.~~

~~(d) Additionally, the following persons should be present:~~

~~(1) for a full flight simulator (FFS), FTD and FNPT a type or class rated instructor from the ATO operating an FSTD or from the main FSTD user;~~

~~(2) for all types, sufficient FSTD support staff to assist with the running of tests and operation of the instructor's station.~~

(d) On a case by case basis for recurrent evaluations, the competent authority may reduce the evaluation team to one inspector provided that all of the following applies:

(1) this composition is not being used prior to the second recurrent evaluation;

(2) such an evaluation is followed by an evaluation with a full competent authority evaluation team;

(3) the inspector satisfies the criteria for both positions as referred in point (a)(1) and (2);

(4) no major modification has been implemented since the preceding evaluation performed by the competent authority;

(5) no relocation of the FSTD has taken place since the last evaluation;

(6) a system is established enabling the competent authority to monitor and analyse the status of the FSTD on a continuous basis;

(7) the FSTD hardware and software has been working reliably for the previous years. This should be reflected in the number and kind of discrepancies (technical log entries) and the results of the compliance monitoring system audits.

(e) In the case of a BITD, the recurrent evaluation may be conducted by one suitably qualified flight inspector only.

Rationale:

The proposed AMC2 ARA.FSTD.100(a);(b);(c) is based on AMC4 ARA.FSTD.100(a). The changes in the composition of the evaluation team are not content wise related, but are aimed at simplifying the text, making it future proof for any FSTD (References to the FSTD types are deleted as they do not exist according to the new CS-FSTD).

Point (a) is re-drafted based on the existing requirements (point (a)(1), (2)) for qualification of the technical and flight inspector. As regards the technical inspectors, it is added that the person has an aviation engineering degree or equivalent. The reasoning for the addition is that it clarifies the expected qualification of the inspector.

For the flight inspector, the re-drafted requirements are the same as the current ones. The person should hold/held an instructor certificate and either holds or has held a type/class rating on the aircraft being simulated or is assisted by a

pilot with class or type rating on the aircraft simulated with sufficient knowledge and flying experience to support the evaluation team.

In the new point (b), first sentence is developed based on existing point (a) to specify FSTD technical inspector and/or the FSTD flight inspector may be staff of the authority, another authority or in exceptional cases person(s) designated by the competent authority. The second sentence in point (b) is the same as the former point (a)(3).

The existing point (b) is deleted with the rationale that such provision was applicable only for FTD1 and FNPT I and since in the new framework there is no differentiation of FSTD type/level, it is considered obsolete. However, for legacy FSTD and for FSTD which will be qualified under the new CS-FSTD, the possibility to perform an evaluation with a reduced team is envisaged in the new point (d).

The new point (c) is developed to ensure that the FSTD inspectors involved in evaluations of FSTD maintain their expertise and experience and if they have not been involved in the FSTD evaluations in the last three years, they need to undergo recency training to regain their expertise. The training is exhaustively addressed in GM4 ARA.GEN.200(a)(2).

The new point (d) is developed based on AMC2 ARA.FSTD.120. It is moved here to align with the scope of point ARA.FSTD.100 . The intention is that the new AMC2 ARA.FSTD.100(a);(b);(c) introduces all possible scenarios for composition of an evaluation team for any evaluation procedure. The content of the new point (d) follows the conditions established in point (b) of the former AMC2 ARA.FSTD.120 with the following change: the evaluation team can be reduced to one inspector (technical or flight inspector), provided that the inspector satisfies the criteria for both positions. It is not considered necessary to specify that a person from the organisation operating the FSTD assists the evaluation, because such provision already is established in the new AMC1 ORA.FSDT.100(a).

The existing point (c) is deleted, because there are not new BITD which will be qualified under the new CS-FSTD.

The existing point (d) is deleted, as it refers to obligations for the organisation operating the FSTD and is moved to AMC1 ORA.FSDT.100(a).

A new point (e) is based on point (c) of AMC2 ARA.FSTD.120.

AMC~~3~~1 ARA.FSTD.100(a)~~(1) Initial e~~Evaluation procedure

TIMELINE FOR THE INITIAL EVALUATION

~~(a) The main focus of objective testing is the QTG. Well in advance of the evaluation date, the aircraft manufacturer and the competent authority should agree on the content and acceptability of the validation tests contained in the QTG data package. This will ensure that the content of the QTG is acceptable to the competent authority and avoid time being wasted during the initial qualification. The acceptability of all tests depends upon their content, accuracy, completeness and recency of the results.~~

(~~b~~a) Much of the time allocated to objective tests depends upon the speed of the automatic and manual systems set up to run each test and whether or not special equipment is required. The competent authority should not necessarily warn the organisation operating an FSTD of the sample validations tests which should be run on the day of the evaluation, unless special equipment is required.

(~~c~~b) The FSTD cannot be used for subjective tests while part of the QTG is being run. Therefore, sufficient time (at least 8 consecutive hours) should be set aside for the examination and running of the QTG.

(~~d~~c) The subjective tests for the evaluation can be found in ~~CS-FSTD(A) or CS-FSTD(H)~~ the applicable PRD, and a suggested subjective test profile is described in AMC~~1~~2 ARA.FSTD.100(a)(~~3~~1) and GM1 ARA.FSTD.100(a)(1). ~~Essentially,~~ Depending on the simulated configurations and complexity of the FSTD and simulated aircraft, at least 1 working day should be required for the subjective test routine, which effectively denies use of the FSTD for any other purpose.

(~~e~~d) To ensure adequate coverage of subjective and objective tests and to allow for cost effective rectification and re-test before departure of the inspection team, adequate time (~~up to~~ approximately 3 consecutive days) should be dedicated to an initial evaluation of an FSTD.

Rationale:

The title and the numbering of the existing AMC3 ARA.FSTD.100(a)(1) is changed to align with the title of point ARA.FSTD.100.

Point (a) is deleted as it is moved to AMC2 ORA.FSTD.200, point (d) as its intention is related to an obligation of an organisation operating the FSTD.

References in the amended point (c) are updated. The addition that at least 1 working day is required for the subjective test routine is made to acknowledge that the time needed is strongly based on the device (e.g. if it has multiple configurations, simulated engines or aircraft types, complexity of the aircraft).

The AMC establishes the timeline only for the initial evaluation. For recurrent evaluation, the timeline is already established in AMC1 ARA.FSTD.120.

AMC1 ARA.FSTD.100(a)(1) Evaluation procedure

RMT.0196

ASSESSMENT PROCESS LEADING TO THE ISSUE OF AN FSTD QUALIFICATION

(a) FSTDs require evaluation leading to qualification. The required process should be accomplished in two distinct steps. First, a check should be made to determine whether or not the FSTD complies with the applicable requirements. When making this check, the competent authority should ensure that accountability for the issue of an FSTD qualification is clearly defined. In all cases an individual department manager of the competent authority should be appointed under whose personal responsibility the issue of an FSTD qualification is to be considered. The second step should be the grant (or refusal) of an FSTD qualification.

(b) When checking compliance with the applicable requirements, the competent authority should ensure that the following steps are taken:

~~(1) Once an FSTD is contracted to be built, the organisation that is to operate the FSTD should ensure that the regulatory standard upon which the FSTD will eventually be~~

~~qualified against is acceptable to the competent authority. This should be the current applicable version of CS-FSTD(A) or CS-FSTD(H) at the time of application.~~

~~(2) A written application for an FSTD qualification should be submitted, in a format according to ORA.FSTD.200, at least 3 months before the date of intended operation. However, the qualification test guide (QTG) may be submitted later, but not less than 30 days before the date of intended evaluation. The application form should be printed in English and any other language(s) of the competent authority's choosing.~~

(~~3~~1) An individual should be nominated by the department manager of the competent authority to oversee, and become the focal point for, all aspects of the FSTD qualification process, and to coordinate all necessary activity. The nominated person should be responsible to the department manager for confirming that all appropriate evaluations/inspections are made.

(~~4~~2) The ability of the applicant to secure, in compliance with the applicable requirements and certification specifications, the safe and reliable operation and proper maintenance of the FSTD should be assessed.

(~~5~~3) The applicant's proposed ~~compliance monitoring~~ management system should be scrutinised with particular regard to the allocated resources. Care should be taken to verify that the system is comprehensive and likely to be effective.

(~~6~~4) The competent authority should inform the applicant of its final decision concerning the qualification within 14 days of completion of the evaluation process ~~irrespective of any temporary qualification issued~~.

(~~7~~5) On completion of the evaluation process, the application, together with a written recommendation and evidence of the result of all evaluations or assessments, should be presented to the nominated person responsible for FSTD qualification. The presentation should be made by the person with overall responsibility, nominated in accordance with (b)(~~3~~1).

(~~8~~6) The department manager of the competent authority should only issue an FSTD qualification certificate if he/she is completely satisfied that all requirements have been met. If he/she is not satisfied, the applicant should be informed in writing of the improvements that are required in order to satisfy the competent authority.

(~~9~~7) If an application for an FSTD qualification is refused, the applicant should be informed of such rights of appeal as exist under national regulations.

Rationale:

The text in point (b)(1) and (2) is moved to AMC2 ORA.FSTD.200 as it is a requirement for the FSTD operator. Reference to temporary qualification in point (b)(4) is deleted due to lack of such possibility in the hard law.

AMC~~1~~2 ARA.FSTD.100(a)(~~3~~1) ~~Initial e~~Evaluation procedure

RMT.0196

FUNCTIONS AND SUBJECTIVE TESTS – SUGGESTED TEST ROUTINE

(a) During initial and recurrent evaluations of an FSTD, the competent authority should conduct a series of functions and subjective tests that together with the objective tests complete the comparison of the FSTD with the ~~aircraft, the class of aeroplane or type of helicopter~~ type/variant/group of aircraft.

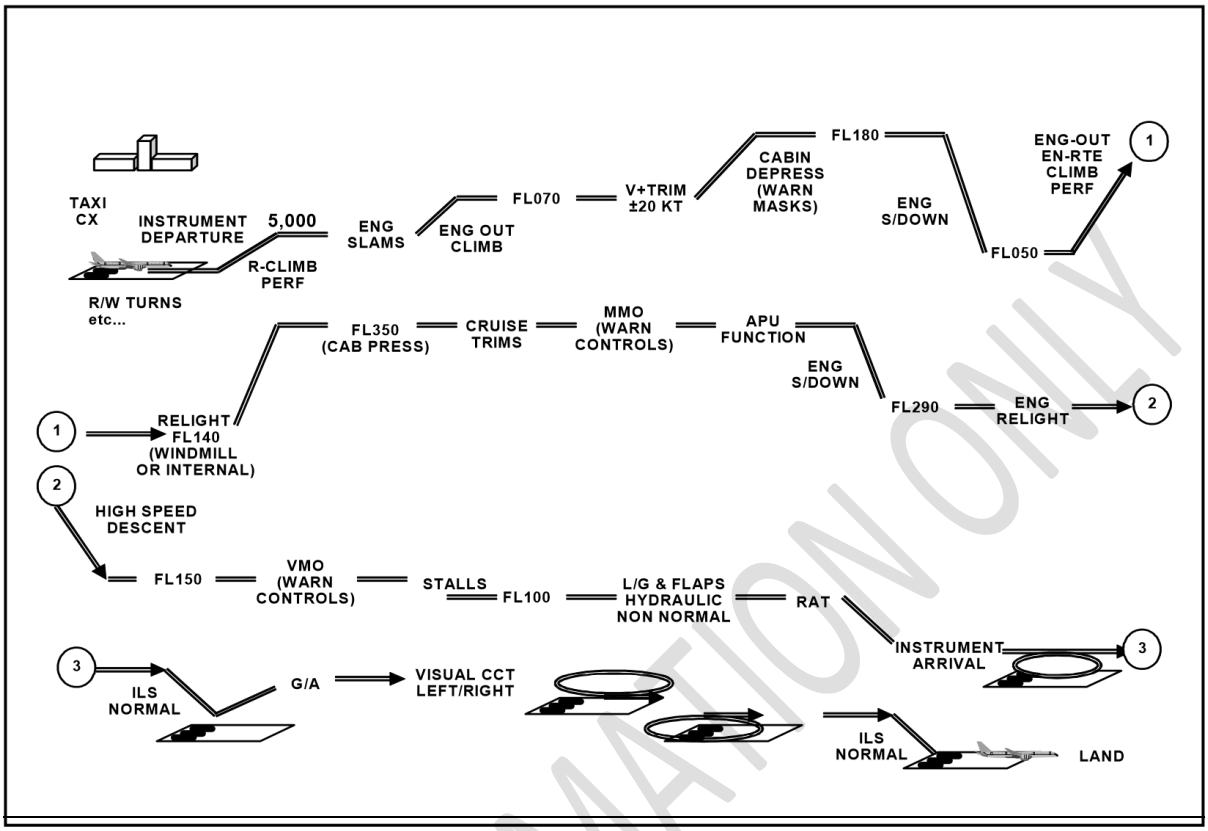
~~(b) Functions tests verify the acceptability of the simulated aircraft systems and their integration. Subjective tests verify the fitness of the FSTD in relation to training, checking and testing tasks.~~

(c) The FSTD should provide adequate flexibility to permit the accomplishment of the desired and required tasks while maintaining an adequate perception by the flight crew that they are operating in a real aircraft environment. Additionally, the instructor operating station (IOS) should not present an unnecessary distraction from observing the activities of the flight crew whilst providing adequate facilities for the tasks.

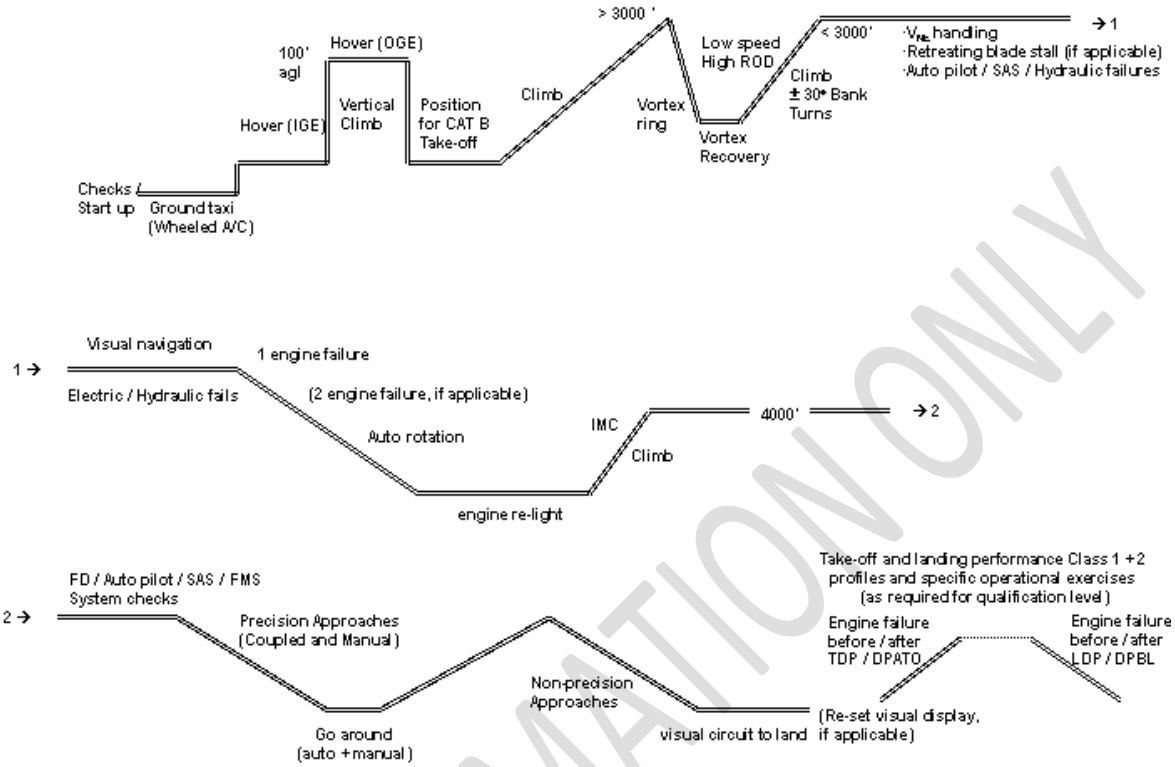
(d) ~~It is important that both the competent authority and the organisation operating an FSTD understand what to expect from the routine of FSTD functions and subjective tests.~~ The competent authority should perform sampling of the functions and subjective tests that are applicable to the device. Part of the subjective tests routine for an FSTD should involve an uninterrupted fly-out ~~(except for FTD level 1) comparable with the duration of typical training sessions in addition to assessment of flight freeze and repositioning. An example of such a profile is to be found under points (f) and (g) (for BITD point (h)).~~ and a flight where the FSTD controls such as flight freeze and repositioning are used. Examples of test profile which may be performed as part of the uninterrupted fly-out are provided in GM1 ARA.FSTD.100(a)(1). The evaluator(s) should brief the planned flight contents and working methods to the persons participating on the evaluation.

~~(e) The competent authorities, and organisations operating FSTD, who are unfamiliar with the evaluation process should contact the Agency or the competent authority of another Member State with adequate expertise in this field.~~

~~(f) Typical test profile for an FSTD aeroplane:~~



~~(g) Typical test profile for an FSTD helicopter:~~



~~(h) Typical subjective test profile for BITDs (approximately 2 hours) - items and altitudes, as applicable:~~

~~(1) instrument departure, climb performance,~~

~~(2) level-off at 4 000 ft,~~

~~(3) fail engine (if applicable),~~

~~(4) engine out climb to 6 000 ft (if applicable),~~

~~(5) engine out cruise performance (if applicable), restart engine,~~

~~(6) all engine cruise performance with different power settings,~~

~~(7) descent to 2 000 ft,~~

~~(8) all engine performance with different configurations, followed by instrument landing system (ILS) approach,~~

~~(9) all engine go-around,~~

~~(10) non-precision approach,~~

~~(11) go-around with engine failure (if applicable),~~

~~(12) engine out ILS approach (if applicable),~~

~~(13) go-around engine out (if applicable),~~

~~(14) non-precision approach engine out (if applicable), followed by go-around,~~

~~(15) restart engine (if applicable),~~

~~(16) climb to 4 000 ft,~~

~~(17) manoeuvring,~~

~~(18) normal turns left and right,~~

~~(19) steep turns left and right,~~

~~(20) acceleration and deceleration within operational range,~~

~~(21) approaching to stall in different configurations,~~

~~(22) recovery from spiral dive,~~

~~(23) auto flight performance (if applicable),~~

~~(24) system malfunctions,~~

~~(25) approach.~~

Rationale:

The title and the numbering of the AMC are changed to align to the hard law amendments.

In point (a) there are changes to align with the definition of group of aircraft (proposed with the amendments in the hard law).

Point (b) is deleted, as the definitions of functions and subjective tests are given in the CS-FSTD. It is assumed that there is no need to reinstate their purpose in the AMC.

Point (d) is revised to improve clarity and readability. The competent authority performs sampling of the functions and subjective tests that are applicable to each device. The duration of the uninterrupted fly-outs is proposed to be at the discretion of the authority and not necessarily comparable with the duration of typical training sessions. With the proposed change the focus on the evaluation can be targeted on functions and subjective tests which are deemed necessary, based on the performance of the FSTD and raised items in the past.

Point (e) is deleted due to: (1) Subpart Part ARA.FSTD is not the appropriate place to specify a requirement for the organisation operating the FSTD; (2) if a need to contact the competent authority arises, the organisation needs to approach their authority first and then upon the competent authority's decision, it may revert to EASA for assistance.

Further it is suggested that the existing typical test profiles for FSTD aeroplane and helicopter are moved in GM (a new GM1 ARA.FSTD.100(a)(1)). The reasoning is that such profiles are indicative, and the operator/authority may define different ones, considering the specificities of each FSTD and the performance of the aircraft simulated.

Points(f) and (g) are moved to GM1 ARA.FSTD.100(a)(1).

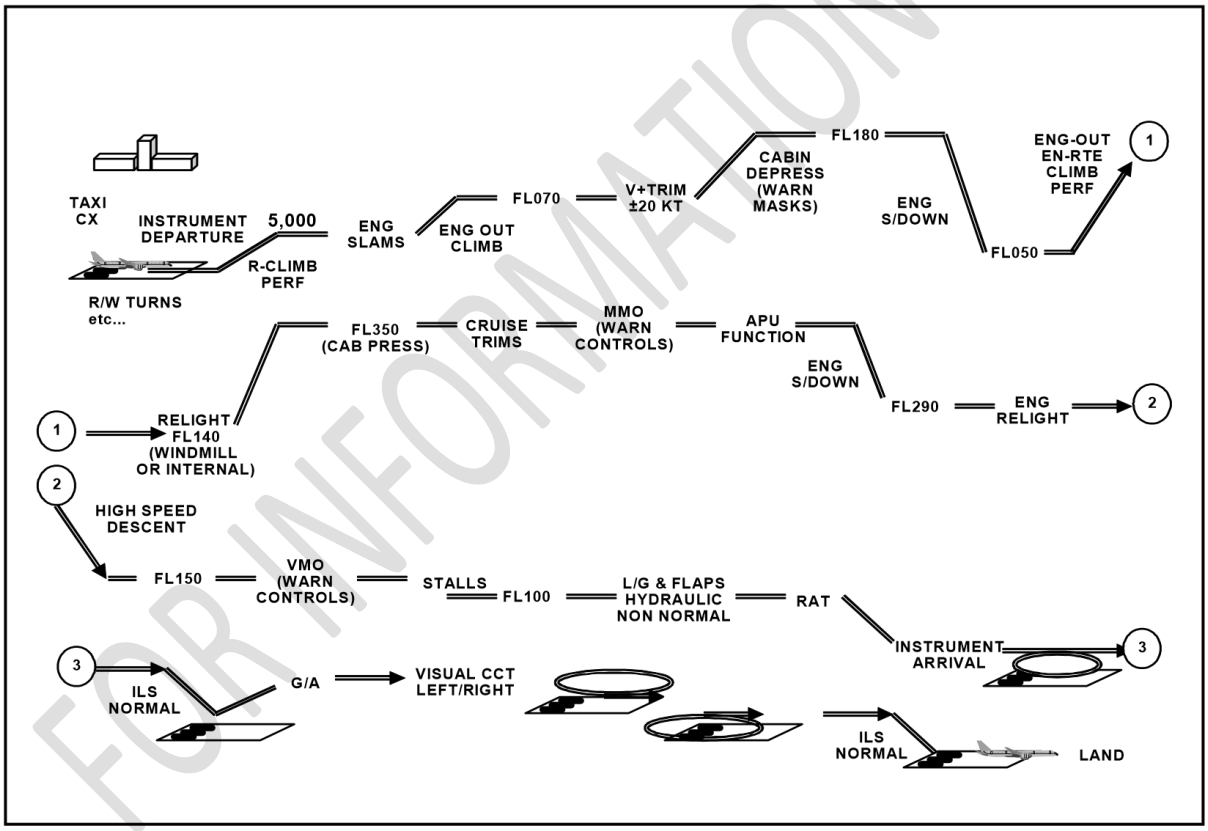
Point (h) is deleted with the rationale that BITD do not exist anymore as type of FSTD according to the CS-FSTD. As regards the recurrent evaluation of already qualified FSTD, the authority should follow AMC1 ARA.FSTD.120 which allows that the profiles are adjusted to the FSTD.

GM1 ARA.FSTD.100(a)(1) Evaluation procedure

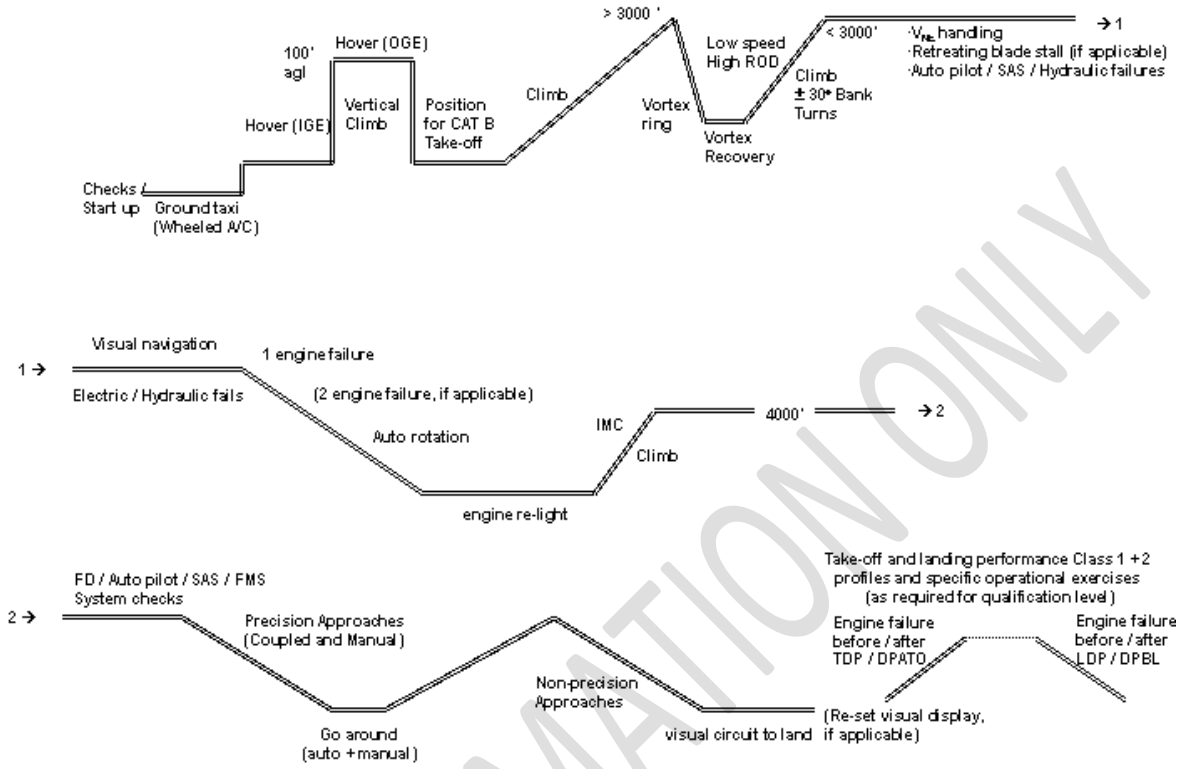
TYPICAL TEST PROFILES

The interrupted fly-out may be most efficiently performed by preparing a flight test profile. An example of such profiles is provided below and should be adapted for each FSTD.

(a) Typical test profile for an FSTD aeroplane:



(b) Typical test profile for an FSTD helicopter:



Rationale:

It is proposed that the existing typical test profiles for FSTD aeroplane and helicopter are provided in GM with the reasoning that such profiles are indicative, and the operator/authority may define different ones, considering the specificities of each FSTD and the performance of the aircraft simulated.

AMC51 ARA.FSTD.100(~~a~~d)~~(1) Initial~~ E~~e~~valuation procedure

RMT.0196

~~FSTD EVALUATION REPORT FOR INITIAL AND RECURRENT EVALUATION~~

~~FSTD Evaluation Report~~

~~Date:.....~~

~~[competent authority]~~
~~FSTD EVALUATION REPORT~~

[Member State] FSTD code (if applicable):
EASA FSTD code (if applicable):
Aircraft type and variant:
Class of aeroplane / type of helicopter:
Engine fit(s) simulated:

Contents

The conclusions presented are those of the evaluation team. The competent authority reserves the right to change these after internal review.

1. Flight simulation training device (FSTD)	
(a) Organisation operating the FSTD:	
(b) FSTD Location:	
(c) FSTD Identification (Member State FSTD code / EASA FSTD Code):	
(d) FSTD Manufacturer and FSTD Identification serial number:	
(e) First entry into service (month/year):	
(f) Visual system (manufacturer and type):	
(g) Motion system (manufacturer and type) :	
(h) Aircraft type and variant:	
(i) Engine fit(s):	
(k) Engine instrumentation: Flight instrumentation:	
2. Evaluation details	
(a) Date of evaluation:	(b) Date of previous evaluation:
(c) Type of evaluation: initial recurrent special	
(d) FSTD Qualification Level recommended: FFS A B C D AG BG CG DG SC FTD 1 2 3 FNPT I II III MCC BITD	
Technical criteria primary reference document:	
Validation data roadmap (VDR) ID-No.:	

3. Supplementary information	
Company representative(s) (FSTD operator, Main FSTD user)	
FSTD seats available	
Visual databases used during evaluation	
Other	
4. Training, testing and checking considerations	
CAT I RVR m DH ft	
CAT II RVR m DH ft	
CAT III RVR m DH ft (lowest minimum)	
LVTO RVR m	
Recency	
IFR-training/check	
Type rating	
Proficiency checks	
Autocoupled approach	
Autoland/Roll out guidance	
ACAS I / II	
Windshear warning system/predictive windshear	
WX-Radar	
HUD/HUGS	
FANS	
GPWS/EGPWS	
ETOPS capability	
RNP APCH LNAV	
RNP APCH LNAV/VNAV	
RNP APCH LPV	
RNP AR APCH	
Other	

5. Classification of items

UNACCEPTABLE

An item that fails to comply with the required standard and, therefore, affects the level of qualification or the qualification itself. If these items will not be corrected or clarified within a given time limit, the (*competent authority*) should have to vary, limit, suspend or revoke the FSTD qualification.

RESERVATION

An item where compliance with the required standard is not clearly proven and the issue will be reserved for a later decision. Resolution of these items will require either:

1. a *competent authority* policy ruling; or
2. additional substantiation.

UNSERVICEABILITY

A device that is temporarily inoperative or performing below its nominal level.

LIMITATION

An item that prevents the full usage of the FSTD according to the training, testing and checking considerations due to the unusable devices, systems or parts thereof.

RECOMMENDATION FOR IMPROVEMENT

An item that meets the required standard, but where considerable improvement is strongly recommended.

COMMENT

Self-explanatory

Period of Rectification

As set out in AMC2 ARA.FSTD.100(a)(1) point (b):

Following an evaluation, it is possible that a number of defects are identified. Generally, these defects should be rectified and the competent authority notified of such action within 30 days. Serious defects, which affect flight crew training, testing and checking, could result in an

~~immediate downgrading of the qualification level, or if any defect remains unattended without good reason for a period greater than 30 days, subsequent downgrading may occur or the FSTD qualification could be revoked.~~

~~6. Results~~

~~6.1 Subjective/Functional~~

~~A Unacceptable~~

~~1~~	

~~B Reservation~~

~~1~~	

~~C Unserviceability~~

~~1~~	

~~D Restriction~~

~~1~~	

~~E Recommendation for improvement~~

~~1~~	

~~F Comment~~

~~1~~	

~~6.2 Objective~~

~~A Unacceptable~~

~~1~~	

~~B Reservation~~

~~1~~	

~~E Recommendation for improvement~~

~~1~~	

~~F Comment~~

~~1~~	

~~7. Evaluation Team~~

~~Name~~	~~Position~~	~~Organisation~~	~~Signature~~
	~~Technical Inspector or person designated by the competent authority~~		
	~~Flight Inspector or person designated by the competent authority~~		
		~~[FSTD User]~~	

		~~[Organisation operating the FSTD]~~	

~~Signed: ..... For the competent authority~~

FSTD EVALUATION REPORT

Logo of the Competent Authority

[competent authority] FSTD EVALUATION REPORT

Date of the report

Report issue number

FSTD Operator

[Competent Authority] FSTD identification code:

Aeroplane/Helicopter type and variant or group of aircraft (only for legacy FSTD):

Engine fit(s) simulated:

Contents

The conclusions presented are those of the evaluation team. The competent authority reserves the right to change these after internal review.

1.	**Flight simulation training device (FSTD)**
(a)	Organisation operating the FSTD:
(b)	FSTD Location:
(c)	(Competent Authority) FSTD Identification code:
(d)	FSTD Manufacturer and FSTD Identification serial number:

(e) First entry into service (month/year):	
(f) Visual system (manufacturer and type):	
(g) Motion system (manufacturer and type) :	
(h) Engine instrumentation: Flight instrumentation:	
2. Evaluation details	
(a) Date of evaluation:	(b) Date of previous evaluation:
(c) Type of evaluation: initial recurrent special	
(d) Technical criteria primary reference document:	
(e) Validation data roadmap (VDR) ID-No.:	
3. Supplementary information	

(a) Evaluation Team

	Name	Position	Organisation
Technical Inspector			
Flight Inspector			
Supporting instructor, when applicable			
Support Staff			

(b) Visual databases used during evaluation:
(c) Software Load Reference used during evaluation:
(d) ESL Revision No and date:
(e) Other:
4. FSTD Qualification
(a) FSTD Qualification Level (recommended) (only in case of legacy FSTD):
(b) FSTD qualified for MCC training (recommended):
(c) FSTD qualified for UPRT (approach to stall or full/post stall) (recommended):
(d) Recommended limitations:

FCS recommended

	FSTD FEATURE	FIDELITY LEVEL	Simulated aircraft
1.	Flight Deck Layout And Structure (FDK)		

2.	Flight Control Forces And Hardware (CLH)		
3.	Flight Control Systems Operation (CLO)		
4.	Aircraft Systems (SYS)		
5.	Performance And Handling On Ground (GND)		
6.	Performance And Handling In Ground Effect (IGE)		
7.	Performance And Handling Out Of Ground Effect (OGE)		
8.	Sound Cueing (SND)		
9.	Vibration Cueing (VIB)		
10	Motion Cueing (MTN)		
11	Visual Cueing (VIS)		
12	Navigation (NAV)		
13	Atmosphere And Weather (ATM)		
14	Operating Sites And Terrain (OST)		

5. Classification of items

During the FSTD evaluation, various identified issues may necessitate operator resolution. It is crucial to differentiate between two distinct categories when managing these items: severity A and severity B.

Item severity A

Items falling into this category are identified by the evaluation team as one of the following:

(a) a simulation feature, system, subsystem, component or part that fails to comply with the qualification basis, which may affect the FCS, ESL or the FSTD qualification and training, testing and checking and/or potentially lead to a negative transfer of training;
(b) non-compliance with the qualification basis, such as objective test results being out of tolerance.

If a limitation is to be added to the qualification certificate, it should be entered as 'Item severity A' with the word 'Limitation: ' preceding the item description.

Item severity B

Items categorised as severity B by the evaluation team are simulation features, systems, subsystems, components, or parts that are temporarily inoperative or operating below their nominal level. However, the overall serviceability of the FSTD is demonstrated by the organisation.

Observation

Issues where compliance with the required standard is not clearly proven and therefore require a subsequent assessment by the FSTD organisation. Following the outcome of each assessment, an 'Observation' may be promoted to 'Item'.

Period of Rectification

The status of each 'Item' and 'Observation' should be notified to the competent authority within the period specified in point (1) to point ARA.FSTD.100(e). Failure to address or clarify the "Item" may result in an enforcement measure by the competent authority in accordance with point ARA.FSTD.135.

6. Results

6.1 Item severity A

1	
2	

6.2 Item severity B

1	
2	

6.3 Observation

1	
2	

6.4 Comments

1	
2	

7. Evaluation team, designated by the competent authority

-Signed..... For the competent authority

Rationale:

A new evaluation report template is proposed to accommodate the FCS concept (where applicable). The report is proposed to be used as a template for any evaluation procedure.

Major changes in the evaluation report:

1.new classification of the items raised by the competent authority. The classification is simplified significantly in comparison to the existing one, calling for 3 possible options: (1) severity item A; (2) severity item B and (3) observations. The AMC provides description of each category. Furthermore, GM is developed to support better understanding of the classification. The simplified proposal considers the comments from NPA 2020-15 mainly on the need to refine the number of the categories and the scope of each "category of item". It is expected that new classification would support better standardisation of FSTD items among the authorities due to the limited possible number of categories and clarity how to use them.

2.the report involves references to ESL, FSTD with FCS (where applicable) and clarifies that an authority may raise an item in case of non-compliance of the FSTD which affects the FCS, ESL or the FSTD qualification.

Having regard to comments in the NPA 2020-15, there is a request to add in this AMC a clarification whether a limitation in the evaluation report results in a limitation being entered in the FSTD certificate. The rulemaking group does not accept the proposal with the reasoning that it is at competent authority's discretion to decide how to address such situations on a case-by-case basis.

GM1 ARA.FSTD.100(d) Evaluation procedure

GUIDANCE ON CLASSIFICATION OF ITEMS

When classifying items severity A, the following should be considered. This list is not exhaustive and items severity A need to be classified on a case-by-case basis:

(a) identified items which affect adversely training, testing and checking or may lead to a negative transfer of training;

(b) subjective tests that deviate from the aircraft behaviour and have impact on training, testing, checking or potentially lead to negative training if the device is used in such condition;

(c) one or several QTG is/are out of tolerance;

(d) check for the relevant systems has failed;

(e) recurring, systemic or critical defects.

When classifying items severity B, the following should be considered. This list is not exhaustive and items severity B need to be classified on a case-by-case basis:

a) simulation features, systems, subsystems, components, or parts that are temporarily inoperative, unusable or operating below their nominal level;

b) limited use of simulation features, systems, subsystems, components, or parts is possible.

For item severity B the overall serviceability of the FSTD is demonstrated by the organisation .

Rationale:

The GM is developed to provide guidance on the criteria when classifying items with severity A or B. It has been decided that providing examples of items severity A or items severity B may be inconclusive, therefore instead of providing examples, the GM guides on the criteria and the impact to support the competent authorities in distinguishing between these categories.

~~GM1 ARA.FSTD.100(a)(1) Initial evaluation procedure~~

~~ED Decision 2012/006/R~~

~~INITIAL EVALUATION~~

~~A useful explanation of how the validation tests should be run is contained in the 'RAeS Aeroplane Flight Simulator Evaluation Handbook' (February 1995 or as amended) produced in support of the ICAO Doc 9625, 'Manual of Criteria for the Qualification of Flight Simulators'.~~

Rationale:

The GM is deleted as it is covered in the CS-FSTD.

~~GM1 ARA.FSTD.100(a)(3) Initial evaluation procedure~~

~~ED Decision 2012/006/R~~

~~GENERAL~~

~~A useful explanation of functions and subjective tests and an example of subjective test routine checklist may be found in the 'RAeS Airplane Flight Simulator Evaluation Handbook' Volume II (February 1995 or as amended) produced in support of ICAO Doc 9625, 'Manual of Criteria for the Qualification of Flight Simulators'.~~

Rationale:

The GM is deleted as it is covered in the CS-FSTD.

~~AMC1 ARA.FSTD.110 Issue of an FSTD qualification certificate~~

~~*RMT.0196*~~

~~BASIC INSTRUMENT TRAINING DEVICE (BITD)~~

~~(a) The competent authority should only grant a BITD qualification for the BITD model to a BITD manufacturer following satisfactory completion of an evaluation.~~

~~(b) This qualification should be valid for all serial numbers of this model without further technical evaluation.~~

~~(c) The BITD model should be clearly identified by a BITD model number. A running serial number should follow the BITD model identification number.~~

~~(d) The competent authority should establish and maintain a list of all BITD qualifications it has issued, containing the number of the BITD model with a reference to the hardware and software configuration.~~

Rationale:

The existing text for the issuance of the BITD certificate is deleted as BITD does not exist in the CS-FSTD.

AMC1 ARA.FSTD.115 Interim FSTD qualification

RMT.0196

NEW AIRCRAFT PROGRAMME ~~FFS / FTD QUALIFICATION – ADDITIONAL INFORMATION~~

(a) Aircraft manufacturers' final data for performance, handling qualities, systems or avionics are seldom available until well after a new or derivative aircraft has entered service. Because it is often necessary to begin flight crew training and certification several months prior to the entry of the first aircraft into service, it may be necessary to use aircraft manufacturer-provided preliminary data for interim qualification of FSTDs. ~~This is consistent with the possible interim approval of operational suitability data (OSD) relative to FFS in the type certification process under Part-21.~~

(b) In recognition of the sequence of events that should occur and the time required for final data to become available, the competent authority may accept the use of certain ~~partially validated~~ preliminary aircraft and systems data, and early release ~~('red label')~~ avionics in order to permit the necessary programme schedule for training, certification and service introduction.

~~(c) Organisations seeking qualification based on preliminary data should, however, consult the competent authority as soon as it is known that special arrangements will be necessary, or as soon as it is clear that preliminary data will need to be used for FSTD qualification. Aircraft and FSTD manufacturers should also be made aware of the needs and agree on the data plan and FSTD qualification plan. There should be periodic meetings to keep the interested parties informed of the project's status.~~

~~(d) The precise procedure to be followed to gain competent authority acceptance to use preliminary data should vary from case to case and between aircraft manufacturers. Each aircraft manufacturer's new aircraft development and test programme is designed to suit the needs of the particular project and may not contain the same events or sequence of events as another manufacturer's programme or even the same manufacturer's programme for a different aircraft. Hence, there cannot be a prescribed invariable procedure for acceptance to use preliminary data. Instead there should be a statement describing the final sequence of events, data sources, and validation procedures agreed by the FSTD operator, the aircraft manufacturer, the FSTD manufacturer and the competent authority. The approval by the Agency of the definition of scope of the aircraft validation source data to support the objective qualification as part of the OSD can also be an interim approval in case of preliminary data. The preliminary data to be used should be based on this interim approval.~~

~~(e) There should be assurance that the preliminary data are the manufacturer's best representation of the aircraft and reasonable certainty that final data will not deviate to a large degree from these preliminary, but refined, estimates. First of all there should be an interim approval of OSD relative to flight simulators in the type certification process under Part-21. Furthermore, the data derived from these predictive or preliminary techniques should be validated by available sources including, at least, the following:~~

> ~~(1) *Manufacturer's engineering report*. Such reports explain the predictive method used and illustrate past successes of the method on similar projects. For example, the manufacturer could show the application of the method to an earlier aircraft model or predict the characteristics of an earlier model and compare the results to final data for that model.~~
>
> ~~(2) *Early flight tests results*. Such data will often be derived from aircraft certification tests, and should be used to maximum advantage for early FSTD validation. Certain critical tests, which would normally be done early in the aircraft certification programme, should be included to validate essential pilot training and certification manoeuvres. These include cases in which a pilot is expected to cope with an aircraft failure mode, including engine failures. The early data available will, however, depend on the aircraft manufacturer's flight test programme design and may not be the same in each case. However it is expected that the flight test programme of the aircraft manufacturer includes provisions for generation of very early flight tests results for FSTD validation.~~

(~~f~~d) The use of preliminary data is not indefinite. The aircraft manufacturer's final data should be available within 6 months after the aircraft's first 'service entry' or as agreed by the competent authority, the organisation and the aircraft manufacturer, but usually not later than 1 year. When an organisation applies for an interim qualification using preliminary data, the organisation and the competent authority should agree upon the update programme. This should normally specify that the final data update will be installed in the FSTD within a period of 6 months following the final data release but not later than two years unless special conditions exist, and a different schedule agreed. ~~The FSTD performance and handling validation would then be based on data derived from~~

~~flight tests. Initial aircraft systems data should be updated after engineering tests. Final aircraft systems data should also be used for FSTD programming and validation.~~ In case the final validation data are not implemented in the subject FSTD within 36 months from its initial qualification, the competent authority should act in accordance with ARA.FSTD.135 (b) (2).

(g) ~~FSTD avionics should stay essentially in step with aircraft avionics (hardware and software) updates. The permitted time lapse between aircraft and FSTD updates is not a fixed time but should be minimal. It may depend on the magnitude of the update and whether the QTG and pilot training and certification are affected. Permitted differences in aircraft and FSTD avionics versions and the resulting effects on FSTD qualification should be agreed between the organisation and the competent authority. Consultation with the FSTD manufacturer is desirable throughout the agreement of the qualification process.~~

~~(h) The following describes an example of the design data and sources which might be used in the development of an interim qualification plan:~~

~~(1) The plan should consist of the development of a QTG based upon a mix of flight test and engineering simulation data. For data collected from specific aircraft flight tests or other flights, the required designed model and data changes necessary to support an acceptable proof of match (POM) should be generated by the aircraft manufacturer.~~

~~(2) In order that the two sets of data are properly validated, the aircraft manufacturer should compare their simulation model responses against the flight test data, when driven by the same control inputs and subjected to the same atmospheric conditions as were recorded in the flight test. The model responses should result from a simulation where the following systems are run in an integrated fashion and are consistent with the design data released to the FSTD manufacturer:~~

~~(i) propulsion,~~

~~(ii) aerodynamics,~~

~~(iii) mass properties,~~

~~(iv) flight controls,~~

~~(v) stability augmentation,~~

~~(vi) brakes and landing gear.~~

(~~i~~e) For the qualification of FSTD of new aircraft types, it may be beneficial that the services of a suitably qualified test pilot are used for the purpose of assessing handling qualities and performance evaluation.

Rationale:

The AMC is revised to align with CS-FSTD and foreseen changes in CS-SIMD. The purpose of the AMC is to establishes the process that the authority follows in case they issue an interim qualification. All other existing points in the AMC which are proposed to be deleted as taken out either because they are covered in the CS-FSTD, Subpart C or that they refer to Part-21 requirements and are not relevant for this AMC.

The first sentence of point (c) is moved to point (e) of AMC2 ORA.FSTD.200, because it refers to requirement for the organisation operating the FSTD and relates to the application process for qualification.

~~GM1 ARA.FSTD.115 Interim FSTD qualification~~

~~*ED Decision 2012/006/R*~~

~~NEW AIRCRAFT FFS/FTD QUALIFICATION – ADDITIONAL INFORMATION~~

~~(a) A description of aircraft manufacturer-provided data needed for flight simulator modelling and validation is to be found in the IATA Document *Flight Simulator Design and Performance Data Requirements* (Edition 6 2000 or as amended).~~

~~(b) The proof of match should meet the relevant tolerances in AMC1 CS-FSTD(A).300 respectively AMC1 CS-FSTD(H).300.~~

Rationale:

The GM is deleted as it is covered in the CS-FSTD.

AMC1 ARA.FSTD.120 Continuation of an FSTD qualification

RMT.0196

GENERAL

(a) *Objective Testing*. During recurrent evaluations, the competent authority should seek evidence of the successful running and analysis of the QTG between evaluations. The competent authority should select a number of tests to be run during the evaluation, including those that may be cause for concern. Adequate notification would be given when special equipment is required for the test.

(b) Essentially the time taken to run the objective tests depends upon the need for special equipment, if any, and the test system, and the FSTD cannot be used for subjective tests or other functions whilst testing is in progress.

(c) For a modern FSTD incorporating an automatic test system, 2 hours would normally be required. FSTDs that rely upon manual testing may require a longer period of time.

(d) Functions and ~~S~~*subjective Testing*. ~~Essentially the same subjective test routine should be flown as per the profile described in AMC1 ARA.FSTD.100(a)(3) with a selection of the subjective tests taken from CS-FSTD(A) or CS-FSTD(H), as appropriate.~~ A functions and subjective test profile should be flown to sample a selection of the subjective tests, as appropriate, based on the past performance of the device, and the applicable PRD as appropriate. Examples of test profile which may be performed as part of the uninterrupted fly-out are provided in GM1 ARA.FSTD.100(a)(1).

(e) Normally, the time taken for recurrent subjective testing is ~~about 4 hours~~ approximately 6 hours, and the FSTD should not perform other functions during this time. If a secondary configuration (e.g. second Engine or Avionics fit) is to be tested, the required time should be increased as appropriate.

(f) To ensure adequate coverage of functions and subjective tests and objective tests during a recurrent evaluation, a total of 8 hours should be allocated. However, it should be remembered that any FSTD deficiency that arises during the evaluation could necessitate the extension of the ~~evaluation period~~ duration of the testing.

Rationale:

The amendment in point (a) is aligned with point (a)(2) of ORA.FSTD.105 where the organisation not only runs the QTG, but also analyses the results.

Amendments in point (d) clarify that the selection of the subjective tests is appropriate to each device based on the performance of the FSTD. This change is aligned with the proposed amendments for sampling the functions and subjective testing in the initial evaluation.

In point (e) the timing is adjusted based on the existing practice for recurrent subjective testing. For example, in the last years it has been evidenced that the subjective testing requires more time than 4 hours in order to allow performing UPRT, PBN approach capabilities. This change, however, does not affect the total number of hours for the recurrent evaluation which remain unchanged.

Point (f) introduces an editorial change.

~~AMC2 ARA.FSTD.120 Continuation of an FSTD qualification~~

~~*RMT.0196*~~

~~COMPOSITION OF THE EVALUATION TEAM~~

~~(a) The composition of the evaluation team for a recurrent evaluation should be the same as for the initial evaluation (see AMC4 ARA.FSTD.100(a)(1).~~

~~On a case-by-case basis (except for BITD), when a specific FSTD in operation by a specific organisation is being evaluated, the competent authority may reduce the evaluation team to:~~

~~(1) the competent authority's flight inspector; and~~

~~(2) a type rated instructor (or class rated instructor for FNPT) from a main FSTD user.~~

~~(b) Evaluations with a reduced evaluation team in line with (a) may only take place if:~~

~~(1) this composition is not being used prior to the second recurrent evaluation;~~

~~(2) such an evaluation is followed by an evaluation with a full competent authority evaluation team;~~

~~(3) the competent authority's flight inspector performs some spot checks in the area of objective testing;~~

~~(4) no major change or upgrading has been applied since the directly preceding evaluation;~~

~~(5) no relocation of the FSTD has taken place since the last evaluation;~~

~~(6) a system is established enabling the competent authority to monitor and analyse the status of the FSTD on a continuous basis; and~~

~~(7) the FSTD hardware and software has been working reliably for the previous years. This should be reflected in the number and kind of discrepancies (technical log entries) and the results of the compliance monitoring system audits.~~

~~(c) In the case of a BITD, the recurrent evaluation may be conducted by one suitably qualified flight inspector only, in conjunction with the inspection of any ATO, using the BITD.~~

Rationale:

The AMC is deleted as its content is integrated into AMC2 ARA.FSTD.100(a);(b);(c).

AMC1 ARA.FSTD.130 ~~Changes~~ Modifications

RMT.0196

GENERAL

(a) ~~The organisation operating an FSTD who wishes to modify, upgrade, de-activate or relocate its FSTD should notify the competent authority~~. When considering applications for a ~~change~~ modification of an ~~the~~ ~~existing~~ FSTD ~~qualification level~~, the competent authority should ensure that accountability for the ~~change~~ modification is clearly defined.

(b) A~~n individual department manager~~ member of the competent authority should be appointed under whose personal authority an FSTD qualification may be ~~changed~~ modified.

~~(c) The written application for a change, including appropriate extracts from the qualification test guide indicating proposed amendments should be submitted in a format and manner as specified by the competent authority. This application should be submitted no later than 30 days before the date of intended change, unless otherwise agreed with the competent authority.~~

(~~d~~c) On receipt of an application for a ~~change~~ modification of ~~the existing~~ an FSTD ~~qualification level~~, the competent authority should conduct such evaluations and inspections as are necessary to ensure that the full implications of the request have been addressed by the organisation operating the FSTD.

(~~e~~d) During the processing of a ~~change~~ modification request, the continued adequacy of the ~~compliance monitoring~~ management system should be reviewed.

(~~f~~e) When the request has been considered and examined, the competent authority should decide on the depth of inspection of the FSTD that is required.

(~~g~~f) The ~~department manager~~ appointed inspector, if satisfied that the organisation operating the FSTD remains competent and the qualification ~~level~~ of the FSTD can be maintained, should issue a revised FSTD qualification ~~documentation~~ certificate, as appropriate.

(~~h~~g) The competent authority should inform the organisation operating the FSTD of its decision within 30 days of receipt of all documentation where no evaluation is required, or within 14 days of any subsequent evaluation.

~~(i) Such documentation includes the appropriate extracts from the QTG amended, when necessary, to the competent authority's satisfaction.~~

Rationale:

The title of the AMC is aligned with the title of the point ARA.FSTD.130.

The first sentence in point (a) is moved to Subpart ORA.FSTD (point ORA.FSTD.110 for modification, relocation, etc) and to ORA.FSTD.105(d) for de-activation/re-activation)) as it relates to obligation of the organisation operating the FSTD.

The term "change of FSTD" is replaced with the term "modification of FSTD" to align with the proposed changes in the hard law.

Point (c) is moved to AMC1 ORA.FSTD.110, point (a) as it is relevant for the organisation operating the FSTD.

In point (d), the reference to compliance monitoring system is replaced with the management system with the rationale that some major FSTD modifications may have impact on training, testing, checking and the continued adequacy with the safety management system should be also reviewed (not only with the compliance monitoring).

The existing point (i) is moved to AMC1 ORA.FSTD.110, point (a) as it is relevant for the organisation operating the FSTD.

AMC2 ARA.FSTD.130 Modifications

EVALUATION CONSIDERATIONS FOR FSTD MODIFICATIONS

(a) In order to determine the need for a special evaluation, the competent authority should consider:

(1) the nature of the modification, its complexity and the risk associated;

(2) performance of the organisation operating the FSTD.

(b) The competent authority should consider the following factors when deciding on the scope and schedule of a special evaluation:

(1) FSTD changes should be assessed using applicable PRD;

(2) the impact of the changes to the ESL;

(3) The impact of changes to the MQTG, such as:

(i) updated validation data in the validation data roadmap;

(ii) updated validation tests and tolerances ;

(iii) updated statements of justification.

(c) In case an FSTD has an assigned FCS and there is a modification which changes that FCS, an evaluation in accordance with point ARA.FSTD.100 (a) should be conducted to assess the FSTD using the applicable PRD at the time of application for the modified FCS. Before re-issuing an FSTD qualification certificate with the modified FCS the competent authority should inform the applicant about the result of the evaluation.

Rationale:

The new AMC provides clarifications to support an authority to decide whether a special evaluation is necessary. Not every major modification would require a special evaluation. It is proposed in point (a) that the authority decides on the need for a special evaluation based on the nature of the modification, the complexity and the risks associated and the performance of the organisation operating the FSDT. Once authority decides to perform a special evaluation, point (b) establishes criteria/factors which should be considered when defining the scope of the special evaluation.

Point (c) tackles the case where an FSTD with assigned FCS would be evaluated for its “true” FCS due to a modification which changes the FCS (e.g. change of a fidelity level for a particular feature). In such case, an evaluation should assess all features of the FCS using the applicable PRD at the time of the application for the modification. The reason to use a qualification basis different from the original PRD is that it is not possible to evaluate such changes using the original qualification basis (specifications for FCS are introduced only with CS-FSTD). Furthermore, it is clarified that the modification should lead to assessment of all features due to several reasons: (1) the impact of the modification of one feature in the FCS should be evaluated in relation to all features; (2) equity and fairness of FSTDs with assigned FCS vs FSTDs which obtain FCS after being evaluated.

GM1 ARA.FSTD.130 Modifications

SPECIAL EVALUATION CONSIDERATIONS FOR FSTD WITH FCS

AIRCRAFT SIMULATION

(a) The aircraft simulation group of FSTD simulation features comprises, amongst others, 'Performance And Handling On Ground', 'Performance And Handling In Ground Effect', 'Performance and Handing Out Of Ground Effect' as well as 'Flight Control Forces And Hardware' and 'Flight Control Systems Operation' features. Changes to these feature fidelity levels usually directly affect handling and performance qualities and will result in updates to the QTG that may justify an in-depth special evaluation covering objective as well as subjective testing.

(b) Aircraft simulation also includes the features 'Flight Deck Layout And Structure' as well as 'Aircraft Systems'. Changes in these feature fidelity levels certainly require subjective testing but may still require updates to the QTG documentation for general requirements and statements of justification, even if there are no objective validation tests affected.

CUEING SIMULATION

(c) The cueing simulation FSTD group of features comprises 'Visual Cueing', 'Motion Cueing', 'Vibration Cueing' and 'Sound Cueing'. Changes to all these cueing systems feature fidelity levels will likely impact the QTG general and objective testing requirements and will require both objective and subjective testing at the discretion of the competent authority. Some visual cueing feature updates may comprise mirror replacement and/or projector replacements for which the competent authority may not require a special evaluation unless the FCS is affected.

ENVIRONMENT SIMULATION

(d) The environment simulation FSTD group of features comprises 'Navigation', 'Atmosphere And Weather' as well as 'Operating Sites And Terrain'. Changes to these feature fidelity levels will probably only require functional and subjective evaluation.

Rationale:

This new GM gives guidance on cases where a special evaluation is recommended for FSTD with FCS.

~~GM1 ARA.FSTD.130 Changes~~

~~*ED Decision 2012/006/R*~~

~~QUALIFICATION OF NEW TECHNOLOGY OR SYSTEMS~~

~~Where an update to an FSTD involves a change of technology or the addition of a new system or equipment that is not covered by the qualification basis used for the existing qualification, an evaluation of such changes may not be possible using this original qualification basis. For these cases, the specific changes can be qualified by using newer Certification Specifications, new AMCs or alternative means of compliance, that apply to these changes, without affecting the overall qualification of the FSTD. This approach should be documented.~~

Rationale:

This GM is suggested to be deleted as this point is moved to AMC ORA.FSTD.210 as it explains the relevant qualification basis that an organisation operating the FSTD should follow in case of a modification of FSTD where it is not possible to use the original qualification basis.

AMC1 ARA.FSTD.135 ~~Findings and corrective~~ actions – FSTD qualification certificate~~–~~ limitation, suspension, revocation

RMT.0196

GENERAL

(a) The competent authority's inspection and monitoring process should confirm the competent authority's continued confidence in the effectiveness of the ~~compliance monitoring~~ management system of the organisation operating an FSTD, and its ability to maintain an adequate standard.

~~(b) If the competent authority is not satisfied, the organisation operating an FSTD should be informed in writing of the details of the conduct of its operation which are causing the competent authority concern. The competent authority should require corrective action to be taken within a specified period (see AMC2 ARA.FSTD.100(a)(1) point (b)).~~

(~~c~~b) In the event that an organisation operating an FSTD fails~~, in spite of warning and advice,~~ to satisfy the competent authority's concerns, a ~~final~~ written notification ~~warning~~ should~~, whenever possible,~~ be given to the organisation together with a firm date by which specified action to satisfy the competent authority should be taken. It should be made clear that failure to comply may result in enforced limitation, ~~or~~ suspension or revocation of the FSTD's qualification.

(~~d~~c) ~~Circumstances may, however, preclude recourse to the process described under (a) to (c). In such cases t~~The competent authority has the duty to preserve quality of training, testing and checking which is of paramount importance and therefore the competent authority may immediately limit, ~~or~~ suspend or revoke any FSTD qualification which it has issued.

(d) The competent authority should record enforcement measures it has applied.

Rationale:

The title of the AMC is changed to align with the hard law provision point ARA.FSTD.135.

In point (a) reference to the organisation's management system is added instead of compliance monitoring as correct a gap. The competent authority's inspection and monitoring process should confirm the continued confidence in the effectiveness of the organisation's management system as a whole and not only the compliance monitoring system.

Point (b) is deleted as it is a provision envisaged in point ARA.FSTD.100(e).

In points (c) and (d) are minor editorial changes.

A new point (e) is introduced to specify the obligation of the authority to keep a record of the applied enforcement measures.

AMC 2 ARA.FSTD.135 ~~Findings and corrective~~ actions – FSTD qualification certificate~~–~~ limitation, suspension, revocation

RMT.0196

SUSPENSION AND LIMITATION

(a) When a decision has been taken to suspend, or limit, an FSTD qualification certificate, the organisation operating an FSTD should be informed immediately by the quickest available means.

(b) In the event of full suspension of an FSTD qualification certificate, the organisation operating an FSTD should be instructed that the FSTD concerned cannot be used for any credited training, testing or checking. The "quickest available means" will in most situations mean the use of a facsimile or email message.

(c) This should be followed by a formal letter giving notice of suspension, or limitation, restating the requirement to cease operations as applicable, and also setting out the conditions on which suspension may be lifted.

(d) If ~~it becomes apparent to~~ the competent authority is notified by the organisation operating the FSTD about the cessation of ~~that~~ the ~~all~~ FSTD ~~operations have ceased~~ over a period in excess of 6 months, the competent authority should consider opening the ~~warning~~ process described in AMC1 ARA.FSTD.135 point~~s~~ (~~a~~b) ~~to (d~~).

(e) The FSTD qualification certificate should not remain suspended indefinitely. Further steps may be taken by the organisation operating an FSTD to reinstate the FSTD qualification or, in default, should be taken by the competent authority to revoke the FSTD qualification certificate. Should an organisation operating an FSTD wish to dispute the suspension of its FSTD's qualification certificate, it should be informed of such rights of appeal as exist under national regulations. If an appeal is lodged, the FSTD qualification may remain suspended until the appeal process is complete.

(f) Suspension of an FSTD qualification certificate may be lifted on appeal or if the organisation operating an FSTD restores the FSTD to its previously acceptable standard.

(g) In neither case should operations be permitted to restart until it has been demonstrated that the cause of the suspension or limitation has been rectified. The competent authority may require a special evaluation depending on the severity of the problem.

(h) The competent authority should issue a formal notice of the lifting of suspension before the organisation operating an FSTD is permitted to resume use of an FSTD.

Rationale:

The title of the AMC is changed to align with the hard law provision point ARA.FSTD.135. The amendments in point (d) clarify the scenario when an authority initiates the process for taking an enforcement measure due to cessation of the FSTD operation for a period over 6 months. This scenario, however, is not relevant when the FSTD is deactivated for a longer period of time.

AMC3 ARA.FSTD.135 ~~Findings and corrective~~ actions – FSTD qualification certificate– limitation, suspension, revocation

RMT.0196

REVOCATION

(a) The competent authority should give the organisation operating an FSTD notice that it intends to revoke the FSTD qualification followed by a formal letter of revocation.

(b) Should an organisation operating an FSTD wish to dispute this revocation, it should be informed of such rights of appeal as exist under applicable regulations. Once revoked, there can be no further activities under the terms of the FSTD qualification.

Rationale:

The title of the AMC is changed to align with the hard law provision point ARA.FSTD.135.

AMC2 ORA.ATO.125 Training programme

RMT.0196

TYPE RATING COURSES – AEROPLANES

[...]

FLIGHT TRAINING

(j) Flight simulation training devices (FSTDs)

A type rating course for a multi-pilot aeroplane should include FSTD training.

The amount of training required when using FSTDs will depend on the complexity of the aeroplane concerned, and to some extent on the previous experience of the pilot. Except for those courses giving credit for previous experience (c.2.), a minimum of 32 hours of FSTD training should be programmed for a crew of a multi-pilot aeroplane. ~~of which~~ With the exception of training programmes for multi-pilot aeroplanes designed in accordance with AMC5 ORA.ATO.125, at least 16 hours of those 32 hours of FSTD training should be in an FFS operating as a crew.

Such FFS time may be reduced if other qualified FSTDs used during the flight training programme accurately replicate the cockpit environment, operation and aeroplane response~~.~~ and are fitted with ~~Such FSTDs may typically include flight management computer (FMC) training devices using~~ hardware and computer programmes identical to those of the aeroplane.

[...]

Rationale

The proposal to amend AMC2 ORA.ATO.125 consists in the alleviation from the requirement to complete a minimum of 16 hours on an FFS. Training programmes designed in accordance with AMC5 ORA.ATO.125 may have less than 16 hours of time spent on an FSTD whose FCS is equivalent to that of an FFS, as defined in the equivalence table of point FCL.036(a)(1). However, the requirement to have a minimum of 16 hours in an FFS is maintained for training programmes making use of legacy FSTDs.

The last sentence is amended as, in accordance with definition (20) of Article 2 and with the provisions of Article 10b of Regulation (EU) No 1178/2011, FMC training devices shall be considered OTDs, not FSTDs.

AMC3 ORA.ATO.125 Training programme

RMT.0196

TYPE RATING COURSES – HELICOPTERS

[...]

(c) Training in helicopter and FSTDs

The training programme should specify the amounts of flight training in the helicopter type and in FSTDs (FFSs, flight training devices (FTDs)~~, or other training devices (OTDs)~~). Where a suitable FFS is geographically remote from the normal training base, the competent authority may agree to some additional training being included in the programme at a remote facility.

[...]

Rationale

The proposal to amend AMC3 ORA.ATO.125 consists in removing the reference to OTDs. Indeed, according to the definition of FSTD contained in Article 2 of Regulation (EU) No 1178/2011, OTDs are not FSTDs. The use of OTDs for type rating training may be permitted in accordance with the amended provisions of Appendix 9, Section A, point 1g.

AMC5 ORA.ATO.125 Training programme

RMT.0196

TYPE RATING TRAINING PROGRAMME DESIGNED USING A TRANING MATRIX

(a) A training programme that uses a training matrix should:

(1) be designed following instructional system design (ISD) methodology;
(2) be designed in a such way that every applicable training task is completed at TP level;
(3) only include FSTDs that have an FCS in their qualification certificate.
Other training devices (OTDs) may be used in accordance with the provisions of Appendix 9, Section A, point 1, provided that negative training is avoided.

(b) Such training programme should include all the following elements:

(1) the set of training tasks and training subtasks which compose a training module, duly encompassing the training considerations regarding the dependencies among training tasks, as specified in point (b) of AMC3 to Appendix 9 to Annex I (Part-FCL);
(2) for each training module, the indication of the associated FCS for both training (T) or training to proficiency (TP);
(3) the minimum FCS required for each module, determined by taking, for each training task and training level, the highest fidelity level for each feature;

(4) the FCS of the training devices referred to in point (a)(3) which should, for each feature, meet or exceed the fidelity levels determined in point (b)(3).

Rationale

The new AMC5 ORA.ATO.125 proposes the requirements and the steps to follow to design a type rating training programme using a training matrix.

The key principles are the following.

1) The training course design should be based on instructional system design methodology, which is described in GM2 ORA.ATO.125 (point (a)(1)).
2) Every training task should be completed at TP level and all the relevant elements of a training task should be covered in the training programme (point (a)(2)).
3) The training devices used for the training course should either have an FCS in the qualification certificate (point (a)(3)).

The training programme should present a set of elements, namely:

- the training modules, which include the set of training tasks (and subtasks) which are conceived to be trained together, which should take account of the training considerations point (b) of AMC3 to Appendix 9, with special regard to the considerations related to the combination of training tasks (point (b)(1));
- the indication of the training level(training (T) or training to proficiency (TP)) for each module (point (b)(2)), which is necessary for an adequate design of the training course and essential for the determination of the minimum FCS required for the training module (point (b)(3));
- the FCS of the training devices used for the training course, which needs to meet or exceed the minimum FCS determined in the process described up to point (b)(3).

GM2 ORA.ATO.125 Training programme

RMT.0196

INSTRUCTIONAL SYSTEM DESIGN

(a) General

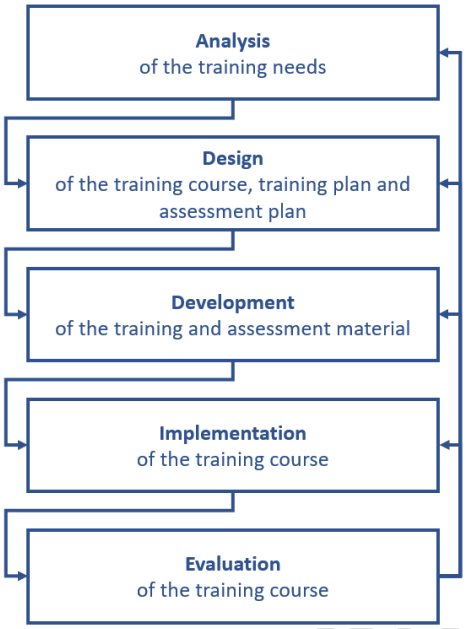
Instructional system design (ISD) is a methodology which provides a systematic and iterative process for course design. It is based on educational needs and applies to both task-based and competency-based training courses.
Guidelines on instructional system design can be found in “ICAO Doc 9868 – PANS Training”.

(b) ADDIE model

While there are several ISD models in use, the “Analyse, Design, Develop, Implement and Evaluate (ADDIE)” – framework is generic to all.

The ADDIE model consists of five workflows:

(1) Analysis of the training needs;
(2) Design of the training course, training plan and assessment plan;
(3) Development of the training course and assessment material;
(4) Implementation of the training course;
(5) Evaluation of the training course.



(c) ADDIE model workflows

(1) Analysis of the training needs

Training organisations should perform a thorough analysis of the training needs of student pilots to determine the training specifications, taking into consideration:

(i) the purpose of the training;
(ii) the level of knowledge and skills that student pilots have at the beginning of the course and the level of proficiency in the execution of the training tasks that they are required to have at the end of the training course;
(iii) the tasks associated with the with the purpose of the training;
(iv) the operational requirements, such as normal, abnormal and emergency operational procedures and the operational environment;
(v) the technical requirements, such as specific operational systems or equipment required to achieve the purpose of the training;
(vi) the applicable regulatory requirements;
(vii) any organisational requirements, such as the availability or accessibility of FSTDs and the use of different training bases.

(2) Design of the training course, training plan and assessment plan

Starting from the training considerations, the training programme, training plan and the assessment plans should be designed.

(i) Training programme design

The training programme design should include the following elements:

(A) the training modules, which include the training tasks and subtasks to be trained together;

(B) for each training module, the expected proficiency level that student pilots should have at the beginning and at the end of each training module, and definition of the operative environments under which each training element of a training module has to be executed;

(C) the sequence of the training modules, ensuring that training proficiency is gradually achieved by transitioning from simple to more complex tasks under progressively more demanding operative conditions;

(D) the performance standard associated to each module or set of modules, whose achievement should be demonstrated by successfully passing an assessment to reach a training milestone.

(ii) Training plan

The training plan should provide the details of the following elements;

(A) the composition and the structure of the training programme;

(B) the training syllabus;

(C) the training milestones;

(D) the course schedule.

(iii) Assessment plan

Assessment plans should be designed to evaluate and grade the performance of a pilot at well-defined points of a training course, normally at the completion of a training module or set of modules, with the aim of ensuring that the required performance standard has been achieved.

The assessment plans should include the following elements:

(A) the objective of the assessment;

(B) the performance standard, the performance criteria and the conditions under which the assessment has to be performed;

(C) the details of the tools used to collect evidence of the performance of a student pilot;

(D) the pass mark for the each assessment;

(E) the number of observations required to assess that a performance standard has been achieved.

(3) Development of the training course and assessment material

The training and assessment materials should be developed based on the content of the training and assessment plans. They may include exercise briefings, practical exercises, presentations, video clips, examination and assessment tools.

(4) Implementation of the training course

The training course should be delivered according to the training plan. The performance of student pilots during the training should be monitored to verify whether to proper standards are met. Feedback on the performance should be continuously provided and, wherever deficiencies are found, adequate remediation should be given in a timely manner.

The assessments should be carried out according to the assessment plan. Each assessment should rely on the following principles.

(i) Validity

All the performance criteria associated to every training task have been evaluated and there is evidence that the performance standard has been achieved.

(ii) Reliability

All the assessors should reach the same or similar conclusions when evaluating and grading the performance of a pilot.

(iii) Repeatability

An adequate number of observations should be taken when deciding whether a performance standard has been achieved.

(5) Evaluation of the training course

The effectiveness of the training course should be continuously evaluated to determine whether improvements are needed, taking into consideration the results of the course, the feedback from student pilots and from instructors and assessors.

Rationale

GM2 ORA.ATO.125 proposes the guidelines for instructional system design (ISD) methodology. ISD is a very important concept for the design of training courses in general and absolutely fundamental in the context of the 'task-to-tool' training paradigm, as the choice of the suitable training devices to be used in a training course depends on the training programme design.

Some basic information on ISD guidelines is already present in GM5 ORA.ATO.230(a) to support the design and implementation of Area 100 KSA for ATPL and CPL theoretical knowledge instruction training courses. The use of ISD is also required for APS MCC training courses, as per AMC2 FCL.735.A.

Given the importance of ISD in the context of RMT.0196 and, in the future, in the context of RMT.0194 for the introduction of competency-based training and assessment (CBTA) courses in Regulation (EU)

No 1178/2011, this new guidance material is proposed in Section I – General of Subpart ATO of Annex VII (Part-ORA).

ISD guidelines are drafted based on Attachment C to Chapter 2 of ICAO Doc 9868 (PANS-Training), having considered that the nature of such attachment is the description of the design principles for CBTA courses. Therefore, the content has been adequately adjusted to make the principles applicable to any task-based or competency-based training courses. Indeed, the section where the adapted competency model is mentioned in the ICAO document has not been included in the context of RMT.0196, as it only pertinent to the scope of RMT.0194.

In point (b), the workflows of ADDIE model are introduced.

In point (c), a detailed explanation of the workflows of ADDIE model is provided.

Point (c)(1) describes the elements that should be analysed during the 'Analysis of the training needs' workflow.

Point (c)(2) describes the elements that should be considered in the training course design, namely:

- the training programme design;
- the training plan, which includes the elements of the training programme;
- the assessment plans.

Point (c)(3) provides examples of the material that may be used for the implementation and assessments of the training course.

Point (c)(4) provides information regarding the elements for the implementation of the training course. Particularly important are three main principles for assessment: validity, reliability and repeatability of the observations of instructors and assessors to determine the achievement of the training milestones and associated standards.

Finally, point (c)(5) underlines that importance of the evaluation of the training course for the purpose of continuous course improvement.

~~GM5 ORA.ATO.230(a) Training manual and operations manual~~

RMT.0196

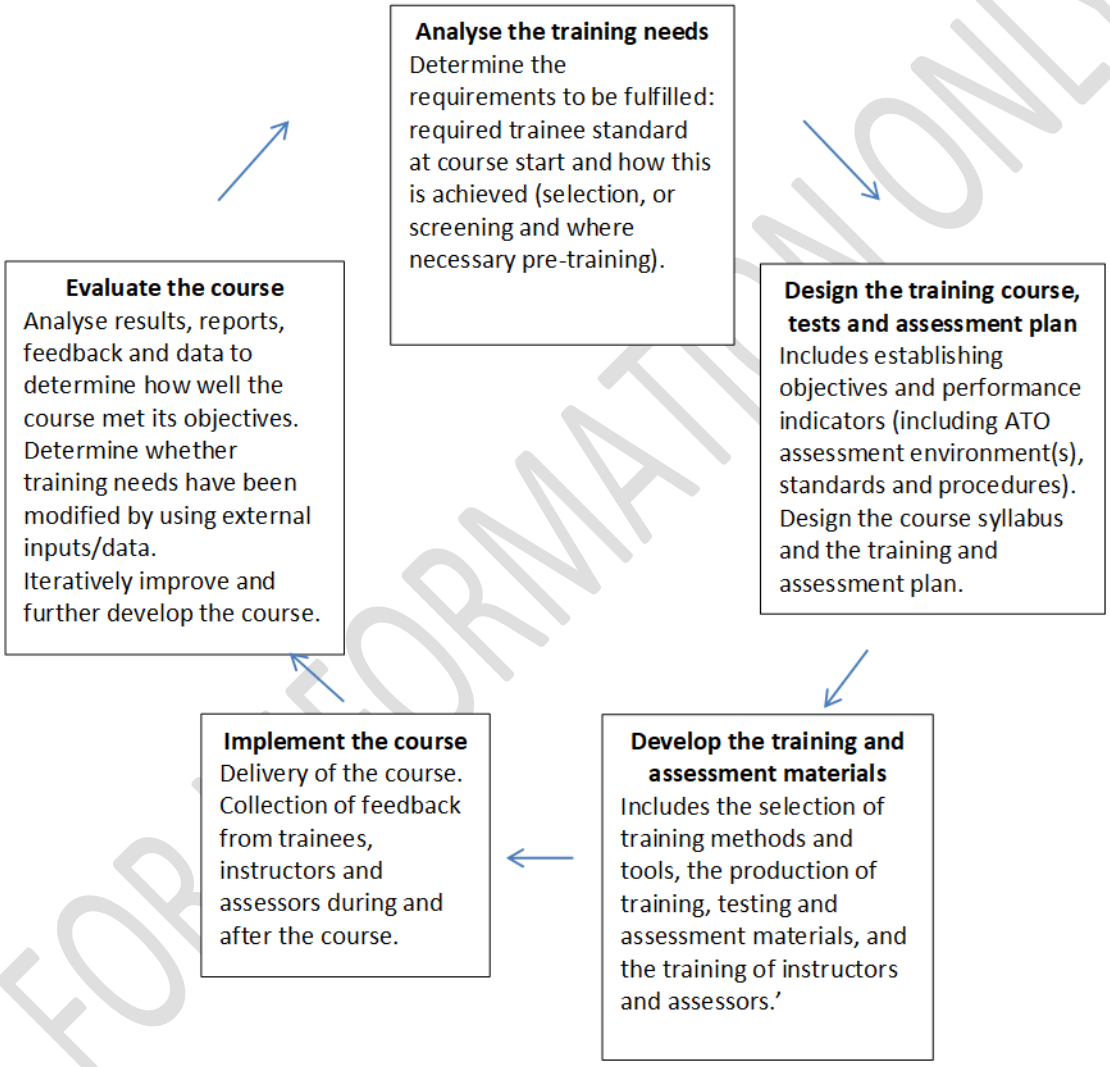
~~INSTRUCTIONAL SYSTEMS DESIGN~~

~~(a) The instructional systems design (ISD) provides a systematic and iterative process for course design based on educational best practices. There are several effective ISD models in use today, with the analyse, design, develop, implement and evaluate (ADDIE) framework being generic to all.~~

~~The purpose of using ISD to design training courses is to facilitate the students' efficient and effective acquisition of knowledge and skills based on current training needs.~~

~~(b) To provide evidence of the effective use of the ISD methodology in the design and continued development of their course(s), an ATO may use documentation and records that relate to the ISD phases.~~

~~(d) ADDIE model example. The 'analysis', 'design', 'development', 'implementation' and 'evaluation' phases of the ADDIE model are shown below with brief phase descriptions.~~



Rationale

GM5 ORA.ATO.230(a) was introduced with ED Decision 2018/001/R to support the implementation of Area 100 KSA in the context of ab-initio training.

For the sake of completeness, due to the relevance of instructional system design in the context of the introduction of the task-to-tool concept and, in the future, of competency-based training and assessment (CBTA) in Regulation (EU) No 1178/2011, general and comprehensive guidelines for instructional system design are proposed to be included as GM2 ORA.ATO.125 in Section I – General of Subpart ATO of Annex VII (Part-ORA), thus making this GM redundant.

No specific references to GM5 ORA.ATO.230(a) are currently present in the Regulation.

~~AMC2 ORA.FSTD.100 General~~

~~*ED Decision 2012/007/R*~~

~~COMPLIANCE MONITORING PROGRAMME – ORGANISATIONs OPERATING FSTDs~~

~~One acceptable means of measuring FSTD performance is contained in ARINC report 433-1 (December 14th, 2007 or as amended) *Standard Measurements for Flight Simulation Quality.*~~

Rationale:

The AMC is proposed to be deleted as there is a new GM providing indicative list of FSTD performance metrics.

AMC~~3~~2 ORA.FSTD.100 General

RMT.0196

COMPLIANCE MONITORING PROGRAMME – ORGANISATIONS OPERATING BASIC INSTRUMENT TRAINING DEVICES (BITDs)

(a) The compliance monitoring programme together with a statement acknowledging completion of a periodic review by the accountable manager should include the following:

(1) a maintenance facility that provides suitable BITD hardware and software test and maintenance capability;

(2) a recording system in the form of a technical log in which defects, deferred defects and development work are listed, interpreted, actioned and reviewed within a specified time scale; and

(3) planned routine maintenance of the BITD and periodic running of the qualification test guide (QTG) with adequate manning to cover BITD operating periods and routine maintenance work.

(b) A planned audit schedule and a periodic review should be used to verify that corrective action was carried out and that it was effective. The auditor should have adequate knowledge of BITDs.

Rationale:

Re-numbering following the deletion of previous AMC.

GM3 ORA.FSTD.100 General

RMT.0196

~~COMPLIANCE MONITORING~~ MANAGEMENT SYSTEM – GUIDANCE FOR ORGANISATIONS OPERATING FSTDs TO PREPARE FOR A COMPETENT AUTHORITY EVALUATION

(a) Introduction

The following material provides guidance on what is expected by the competent authorities to support the discussion during the preliminary briefing, which is a first step of any initial or recurrent evaluation of an FSTD carried out by a competent authority.

This document has been developed as well to standardise working methods throughout Member States and to develop effective CM spot checks to satisfy the applicable requirements and therefore to ensure the highest standards of training are attained.

The organisation operating the FSTD should provide to the competent authority at least 7 days prior to the date of the planned evaluation:

(1) the dossier for initial evaluation, referred in point (c),

(2) the dossier for recurrent evaluation, referred in point (d).

(b) Document form

Different document forms can be considered. Nevertheless, it appears that the best solution is a dossier, which includes all the information required by the competent authority to perform an evaluation.

(c) Contents of the dossier for an initial evaluation:

(1) type of FSTD and qualification level or FCS, as applicable ~~requested~~;

(2) evaluation agenda: including date of evaluation, name of people involved for the competent authority, contact details for the FSTD operator, schedules for the subjective flight profile, QTG rerun;

(3) FSTD identification and detailed technical specification including, type of FSTD, manufacturer, registration number, date of entry into service, host computer, visual system, motion system, type of IOS, simulated version(s), standards of all the aircraft computers, if applicable. Manuals needed for an evaluation (e.g. flight manuals, system manuals, acceptance test manual, IOS user manual etc. – if applicable) could already be provided as part of the dossier in an electronic format;

(4) planned modifications;

(5) subjective open defect(s);

(6) airport visual databases including for each visual scene, name of the airport, IATA and ICAO codes, type of visual scene (specific or generic), additional capabilities (e.g. snow model, WGS 84 compliance, enhanced ground proximity warning system (EGPWS)); and

(7) QTG status: the list should include for each QTG test available the status of the tests following the FSTD operator and competent authority reviews.

(d) Contents of the dossier for a recurrent evaluation:

(1) type of FSTD and qualification level or FCS, as applicable ~~requested~~;

(2) evaluation agenda, including date of evaluation, name of people involved for the competent authority, contact details for the operator, schedules for the subjective flight profile, QTG rerun and QTG review;

(3) FSTD identification, including type of FSTD, manufacturer, registration number, date of entry into service, host computer, visual system, motion system, type of IOS, simulated version(s), standards of all the aircraft computers, if applicable;

(4) status of items raised during the last evaluation and date of closure;

(5) reliability data: training hours month by month during the past year, numbers of complaints mentioned in the technical log, training hours lost, availability rate;

(6) operational data: a list of FSTD users over the previous 12 months should be provided, with number of training hours;

(7) failure tabulation including categorisation of failures (by ATA chapter and Pareto diagram, ARINC classification);

(8) details of main failures leading to training interruption or multiple occurrences of some failures;

(9) hardware and/or software updates or changes since last evaluation and planned hardware and/or software updates or changes;

(10) subjective open defect(s);

(11) airport visual databases including for each visual scene, name of the airport, ATA and ICAO codes, type of visual scene (specific or generic), additional capabilities (snow model, WGS 84 compliance, EGPWS);

(12) QTG status: the list should include for each QTG test available, the date of run during the past year, any comment, and the status of the tests; and

13) results of scheduled internal audits and additional quality inspections (if any) since last evaluation and a summary of actions taken.

Rationale:

The GM refers to the management system of the organisation operating the FSTD an therefore the title of the GM is corrected.

In point (a) a new paragraph is added to clarify the expected timing for delivery of the dossier for the initial and recurrent evaluation. The proposed period is based on the existing industry practice.

Minor changes to introduce FSTD with FCS which will be available after the issuance of the CS-FSTD.

AMC1 ORA.FSTD.100(a) General

PERSONNEL IN SUPPORT OF AN INITIAL, RECURRENT, SPECIAL EVALUATION

The following persons from the organisation operating the FSTD should be present to support the evaluation:

(a) a pilot with appropriate class or type rating on the aircraft simulated and with sufficient knowledge and flying experience on such aircraft, acceptable to the competent authority. For initial evaluation, the pilot should have current flying experience on the aircraft simulated; and

(b) FSTD support staff to assist with the running of tests and operation of the instructor's station.

Rationale:

The new AMC is developed based on AMC4 ARA.FSTD.100(a)(1) and AMC2 ARA.FSTD.120, point (a) to specify the obligation for the organisation operating the FSTD to provide personnel in support of initial and recurrent evaluations. That obligation is transferred to the new AMC ORA.FSTD.100(a).

The competence of personnel in support of an evaluation in point (a) is open to holders of a pilot licence with a rating on the type or group of aircraft simulated who have sufficient knowledge and flying experience on that aircraft, acceptable by the authority. In comparison to the existing AMC which requires only type or class rating instructor as currently, the proposal allows more flexibility and opportunities for the organisations operating the FSTD to find appropriate personnel in support of the evaluation. For initial evaluation, it is considered that the pilot should have current flying experience due to the nature of this evaluation.

Point (b) follows the current requirement in AMC4 ARA.FSTD.100(a)(1)(d)(2) and AMC2 ARA.FSTD.120, point (a) and is proposed to be inserted here as it establishes requirement for the organisation operating the FSTD.

AMC1 ORA.FSTD.100(b) General

PROCEDURE FOR THE EQUIPMENT SPECIFICATION LIST (ESL)

The procedure for the equipment specification list (ESL) should be part of the organisation management system and include at the least the following:

(a) the position(s) of person(s) in the organisation operating the FSTD responsible for developing and maintaining the ESL;

(b) the method(s) for verification and validation of entries in the ESL to comply with the requirements in point ORA.FSTD.120;

(c) the internal process for modifications in ESL, including the configuration control management of the organisation;

(d) the notification process to the competent authorities in case of a major modification which affects the ESL in accordance with point ORA.FSTD.110;

(e) how the organisation operating the FSTD ensures that ESL is displayed and accessible for all FSTD users and authorities as referred in point ORA.FSTD.115;

(f) documentation and record keeping of the ESL in accordance with ORA.FSTD.240.

Rationale:

The new AMC is established to clarify the minimum content of the procedure for ESL that the organisation operating the FSTD has to develop and maintain. All organisations operating the FSTD (including legacy FSTD) shall develop such procedure, based on point ORA.FSTD.100. Therefore, the AMC is expected to support them in establishing compliance with this point.

AMC1 ORA.FSTD.100(c) General

CORRECTIVE-ACTION PLAN AND IMPLEMENTATION

(a) The corrective action plan should address the items raised by the competent authority following an evaluation and should include the correction of the item, root cause analysis where relevant, corrective and preventive action(s), as well as the time schedule to implement them.

(b) Depending on the items raised, the organisation may need to take immediate corrective action.

(c) The corrective action plan should be signed by the person nominated by the organisation operating the FSTD in accordance with ORA.GEN.210(b) or his/her delegate.

Rationale:

The new AMC clarifies the process and the timelines that an organisation operating the FSTD should follow when an authority raises an item. The deadline proposed in point (a)(2) in the AMC is based on the current period for rectification of an item as referred in the existing AMC2 ARA.FSTD.100(a)(1), point (b).

GM1 ORA.FSTD.100 (c) General

GENERAL

(a) Preventive action is the action to eliminate the cause of a potential item or other undesirable potential situation.

(b) Corrective action is the action to eliminate or mitigate the root cause(s) and prevent recurrence of an existing detected non-compliance or other undesirable condition or situation.

(c) Correction is the action to eliminate a detected non-compliance.

ROOT CAUSE ANALYSIS

(a) Proper determination of the root cause is crucial for defining effective corrective actions to prevent reoccurrence of the item on the FSTD.

(b) It is important that the analysis does not primarily focus on establishing who or what caused the non-compliance (item), but on why it was caused. Establishing the root cause(s) of a non-compliance often requires an overarching view of the circumstances that led to it, to identify all possible systematic and contributing factors (human factors, regulatory, organizational, technical factors, etc.) in addition to the direct factors.

(c) A narrow focus on single events or failures, or the use of a simple, linear model, such as a fault tree, to identify the chain of events that led to the non-compliance, may not properly reflect the complexity of the issue, and therefore, there is a risk that important factors that must be considered to prevent reoccurrence will be ignored. Such an inappropriate or partial root cause analysis often leads to applying 'quick fixes' that only address the symptoms of the non-compliance. A peer review of the results of the root cause analysis may increase its reliability and objectivity.

(d) The analysis should consider whether the item equally affects other FSTD operated by the organisation.

Rationale:

The new GM defines the terms "preventive action", "corrective action" and "root cause analysis" which are used in the AMC ORA.FSTD.100(c).

GM1 ORA.FSTD.100 (d) General

FSTD PERFORMANCE METRICS

(a) FSTD performance should be measured by recording the following:

(1) Scheduled training time

The time the FSTD is scheduled to deliver training. The information should be available month by month per user.

(2) Support time

The support time is the addition of the following times:

— Maintenance: preventive and corrective;

— Engineering: development, improvement of the FSTD;

— Regulatory: authority evaluation, QTG rerun, self-evaluation, fly-out;

— Configuration: change of configuration, time between two FSTD sessions;

— Out of service: scheduled out of service because of major update or closure of the training centre.

(3) FSTD utilisation, which is calculated as follows:

*(scheduled training time)/(length of the year*24h - support time – FSTD down time) * 100*

(4) Average FSTD Quality Rating (Instructor and/or Crew)- Rating Scale of 1 to 5

1 = Unsatisfactory: No training completed

2 = Poor: Some training completed

3 = Acceptable: All training completed, many workarounds and or many interrupts

4 = Good: All training completed, few workarounds and or few interrupts

5 = Excellent: All training completed, no workarounds and no interrupts

(5) FSTD failure time during scheduled training time

This time is measured by the FSTD support team. This metric takes into account FSTD-specific failures only. Failure time during crew breaks should be recorded.

(6) FSTD downtime during scheduled training time

This time is measured by the FSTD support team. This metric takes into account all events that could affect the availability of the FSTD (e.g. FSTD failure time, installation issue (electric, air conditioning), users' wrong input). Downtime during crew breaks should be recorded.

(7) Number of interrupts during scheduled training time

An interrupt is considered an event that suspends a flight crew's (or other users') FSTD session.

(8) Number of discrepancies raised by FSTD users

(9) FSTD availability, which is calculated as follows:

*(scheduled training time - FSTD down time) / (scheduled training time) * 100*

(10) FSTD reliability is calculated as follows:

*(scheduled training time - FSTD failure time) / (scheduled training time) * 100*

Rationale:

This GM establishes an indicative list of FSTD performance metrics which an organisation operating the FSTD may use when establishing compliance with point ORA.FSTD.100(d). The proposed metrics are set up as GM and not as AMC due to a wide variety of FSTDs and organisations (complex/non-complex). Instead of defining such metrics as AMC, the intention is that the organisation uses the proposed list of metrics in the GM and may tailor them according to their needs and available information. These metrics have been defined based on industry best practice.

AMC1 ORA.FSTD.105(a)(1) Maintaining the FSTD qualification

MAINTAINING QUALIFICATION STANDARDS

(a) To ensure that the FSTD is maintained to the standard of the qualification basis, the organisation operating the FSTD should:

(1) establish a schedule of routine maintenance, ensuring that all components are inspected and where applicable tested to meet the qualification basis;

(2) provide training for maintenance personnel, relevant to their assigned tasks, for the ongoing maintenance of the FSTD, including areas critical to maintaining qualification basis;

(3) ensure that a current technical log listing defects, deferred defects and their status is displayed and accessible to all FSTD users.

MAINTAINING QUALIFICATION STANDARDS – FUNCTIONAL PRE-FLIGHT CHECK

(b)To ensure the optimal condition of the FSTD and readiness for the day's training, the organisation operating the FSTD should:

(1) assign specific individuals responsible for conducting daily pre-flight checks;

(2) verify that all systems start correctly and perform any necessary calibration procedures to ensure accuracy and reliability;

(3) ensure that all critical systems of the FSTD are fully operational and capable of supporting the training scenarios planned for the day. This consolidated check covers visual displays, motion systems, flight controls, instrumentation, avionics, and software systems;

(4) verify that the correct configuration (hardware and software) is set for the intended training;

(5) ensure all emergency systems, including communication systems and safety equipment, are operational;

(6) maintain a detailed record of all daily pre-flight checks performed on the FSTD to ensure accountability, traceability, and compliance; including the date, time, the individual conducting the check, specific configuration checked, and any discrepancies found;

(7) address all identified discrepancies, affecting training, unless otherwise deferred, before the device is used, and document the resolution of these issues;

(8) provide appropriate training to the personnel to perform the work;

(9) provide initial and refresher safety training to the personnel.

Rationale:
The new AMC is developed following the entire revision of point ORA.FSTD.105. The major rationale is that the new CS-FSTD is intended only for the initial FSTD qualification, while Subpart ORA.FSTD outlines the process for maintaining the device in accordance with the applicable qualification basis. Therefore, all newly developed AMC to point ORA.FSTD.115 aim at providing clarifications how to ensure FSTD maintenance.
Point (a) to this AMC outlines the activities that the organisation operating the FSTD should follow in order to maintain the FSTD in a condition that it consistently performs according to the qualification basis. It proposes that the organisation defines a schedule of routine maintenance, provide training to the maintenance personnel for ongoing maintenance and maintains a log of defects identified during the use of the FSTD. In addition, the proposal specifies that the organisation operating the FSTD should inform the users of FSTD defects and their status, ensuring traceability and accountability.

Point (b) is developed based on the existing requirements in the CS-FSTD(A)/CS-FSTD(H) related to the functional pre-flight checks. As these requirements are not anymore foreseen in the new CS-FSTD, they have been integrated into this AMC. The AMC specifies tasks the organisation operating the FSTD should follow in order to perform the pre-flight checks within the preceding 24 hours of using the FSTD. These tasks have been defined based on the existing practice for performing the pre-flight check.

AMC1 ORA.FSTD.105(a)(2) Maintaining the FSTD qualification.

QUALIFICATION TEST GUIDE (QTG) PERIODIC TESTING – OBJECTIVE TESTS

(a) To conduct the objective tests of the FSTD as per the Master Qualification Test Guide (MQTG) over a 12-month period starting from the end of the month of the initial qualification unless another date is agreed with the competent authority, the organisation operating the FSTD should:

(1) develop and document a detailed testing plan that aligns with the MQTG, objective tests, and specifying timelines, responsibilities;

(2) divide the objective tests defined in the MQTG into four equal parts, ensuring that each part represents an equivalent sampling of the entire MQTG document. Conduct these tests in a quarterly schedule, ensuring that all tests are completed over the previous 12 months;

(3) implement tools and/or methods to assess the FSTDs performance and identify potential discrepancies during the objective testing.

(b)To ensure that results from the objective tests are appropriately analysed, evaluated and documented, the organisation operating the FSTD should:

(1) define and implement standard documentation practices for recording test results;

(2) establish a periodic review to assess the completeness and accuracy of the test records and result analysis.

Rationale:
The new AMC outlines how the organisation should organise the planning, conducting, assessing and documenting the results of the objective testing established in point ORA.FSTD.105(a)(2). In point (a) is clarified the start of the 12- month period for conducting the objective tests in the MQTG and the tasks for the organisation to perform these tests. Point (b) defines the means how to analyse, evaluate and document the objective results.
The AMC is developed based on the existing practice and standards in the CS-FSTD(A)/CS-FSTD(H) how to perform the objective tests which do not exist anymore in new CS-FSTD and therefore are integrated in point ORA.FSTD.105 and the related AMC/GM.

AMC1 ORA.FSTD.105(a)(3) Maintaining the FSTD qualification

QUALIFICATION TEST GUIDE (QTG) PERIODIC TESTING – FUNCTIONS AND SUBJECTIVE TESTS
(a) To conduct the functions and subjective tests of the FSTD over 24-month period, starting from the end of the month of the initial qualification unless another date is agreed with the competent authority, the organisation operating the FSTD should:

(1) develop and document a detailed testing plan that aligns with the MQTG functions and subjective (F&S) tests, and specifying timelines, responsibilities;

(2) determine which tests are applicable to each FSTD and perform these tests. (Note: Further guidance on typical test profiles which are part of the functions and subjective tests is provided in GM1 ARA.FSTD.100 (a)(1));

(3) divide the F&S tests described in the MQTG into four equal parts, ensuring that each part represents an equivalent sampling of the F&S tests. Conduct a quarter of the tests every 6-months, ensuring that all tests are completed over the course of 24 months. The areas to be tested in each fly-out should be selected so that no area is left untested over the 24-month period;

(4) implement tools and/or methods to assess the FSTDs performance and identify potential discrepancies during the functions and subjective testing.

(b) The organisation operating the FSTD should use aircraft flight manuals, pilot operating handbooks and checklists (normal, abnormal and emergency) that correspond to the FSTD to support the functions and subjective testing. These may be documents of the real aircraft. In case the FSTD does not correspond to a real aircraft (e.g. FSTD has generic fidelity level(s)), a manual/handbook should be created by the organisation operating the FSTD with details for operating procedures and description of the aircraft systems, including any limitations to support the training use.

Rationale:
The new AMC outlines how the organisation should organise the planning, conducting, assessing and documenting the results of the functions and subjective testing established in point ORA.FSTD.105(a)(3).
Similarly to the objective tests, the AMC clarifies the start of the 24- month period for conducting the F&S tests in the MQTG and the tasks for the organisation to perform these tests.
The AMC is developed based on the existing practice and standards how to conduct the F&S tests.
Furthermore, according to the new CS-FSTD, the organisation operating the FSTD is responsible to determine what F&S tests are applicable to the FSTD. Therefore, point (a)(2) is established to specifies it.
In point (a)(3), the AMC defines how F&S tests should be conducted progressively over a 24-month cycle. The intention is to divide them into four equal parts, ensuring that all tests are completed over the course of 24 months.
Point (a)(4) similarly to AMC1 ORA.FSTD.105(a)(2) specifies that the organisation should assess the performance during the F&S and identify any discrepancies.
Point (b) is developed to indicate what documentation an organisation can use to support running the F&S tests. In case of real aircraft, it may use existing aircraft manuals, handbooks or checklists to support the F&S tests. In case the FSTD does not correspond to a real aircraft, the organisation should develop such manual, handbook.

AMC1 ORA.FSTD.105(a)(4) Maintaining the FSTD qualification

CONFIGURATION CONTROL — HARDWARE AND SOFTWARE

(a) To preserve the integrity of the FSTDs hardware and software, the configuration control system should:

(1) implement a process that includes the assessment of potential impact of a modification to the FSTDs;

(2) track changes in hardware and software, ensuring all modifications are documented and validated;

(3) provide traceability of the modifications performed on an FSTD, to cover hardware, software, firmware and installed databases.

(b) The FSTD, where applicable, should be maintained in a configuration that accurately represents the aircraft being simulated. This may be a specific aircraft tail number or may be a representation of a common standard.

CONFIGURATION MANAGEMENT — DATABASE MANAGEMENT

(c) The FSTD operator should establish a process for maintaining, updating, and validating all installed databases for each qualification certificate held, and should:

(1) identify and assess all databases relevant to FSTD capabilities, including visual model databases, navigational aids, declination, terrain, obstacles, terrain awareness warning systems, FMS/GNSS navigation database and other navigation related aircraft databases;

(2) specify the required frequency of updates for each system and where applicable adhere to frequency of updates for those databases which have specific update requirements stated by the database supplier;

(3) maintain configuration control records for each database update;

(4) perform validation checks to confirm the functionality of the FSTD following database updates.

(d) When the FSTD 'Navigation (NAV)' feature has a fidelity level S, the navigational data shall be maintained up-to-date as per the aircraft update cycle.

(e) When the FSTD 'Navigation (NAV)' feature has a fidelity level R, the navigational data, navigation databases and the instrument charts used for the training tasks should be synchronised with the same cycle date as the navigational data. These databases should be updated on a 3-month cycle at maximum.

(f) When the FSTD 'Navigation (NAV)' feature has a fidelity level G, the navigation databases and the instrument charts used for the training tasks should be synchronised with the same cycle date as the navigational data.

(g)The organisation operating legacy FSTD should follow the applicable PRD for the frequency of the updates of the database systems.

Rationale:
The new AMC is developed to provide clarifications how an organisation operating the FSTD establishes and maintains a configuration control system, including database management.
Point (a) defines the tasks of the organisation operating the FSTD as part of a configuration control system.
Point (b) is based on point (a) of the existing AMC1 ORA.FTD.110. The latter is moved here as it refers to configuration control requirements.
Point (c) defines the tasks of the organisation operating the FSTD as part of the process for database management.
Points (d), (e), (f) determine the frequency for updates of navigation database for FSTD which have FSTD 'Navigation' (NAV) feature at fidelity level S, R or G. The rationale for adding them in this AMC is that such standards will not be described in the CS-FSTD, and it has been decided to integrate these requirements in Subpart ORA.FSTD.
Point (g) clarifies that the legacy FSTD follows the applicable PRD as regards the frequency of the updates of the database systems.

AMC1 ORA.FSTD.110 Modifications

RMT.0196

GENERAL

(a) The written application for a modification, including appropriate extracts from the qualification test guide, if applicable, and/or ESL as amended, when necessary, or any other supporting documents indicating proposed amendments should be submitted in a format and manner as specified by the competent authority. This application should be submitted no later than 30 days before the date of intended change, unless otherwise agreed with the competent authority.

(~~a~~) ~~The FSTD, where applicable, should be maintained in a configuration that accurately represents the aircraft being simulated. This may be a specific aircraft tail number or may be a representation of a common standard.~~

(~~b~~c) Users of the device should always establish a differences list for any device they intend to use, and to identify how any differences should be covered in training. In order to ensure each device is maintained in the appropriate configuration, the organisation operating an FSTD should have a system that ensures that all relevant airworthiness directives (ADs) are introduced where applicable on affected FSTDs.

(~~c~~d) ADs from ~~both~~ the State of Design of the aircraft, the State/EASA where the FSTD is qualified and the State where the FSTD is located should be monitored. ADs from the State of Design of an aircraft are usually automatically applicable, unless specifically varied by the aircraft's State of Registry.

(~~d~~e) Where appropriate, ADs issued by States where users of the device have aircraft registered should also be monitored. In addition to ADs, the FSTD operator should also put in place processes that ensure all aircraft modifications are reviewed for any effect on training, testing and checking. This can be achieved by reviewing the aircraft manufacturer's service bulletins and may require a specific link to the aircraft manufacturer to be developed. In practice this link is often established through aircraft operators who use the device.

~~(e) Organisations operating FSTDs should notify the competent authority of major changes.~~

~~(f) This does not imply that the competent authority will always wish to directly evaluate the change. The competent authority should be mindful of the potential burden placed on the organisation by a special evaluation and should always consider that burden when deciding if such an evaluation is necessary.~~

(~~g~~f) The organisation operating the FSTDs should have an internal acceptance process for modifications, to be used when implementing all modifications, even if the competent authority has made a decision to carry out an evaluation.

Rationale:

New point (a) is developed based on AMC1 ARA.FSTD.130, point (c) which is moved here as it refers to requirement relevant for the organisation operating the FSTD. It is slightly amended to include reference to ESL which may be attached to the application form when a major modification affects the ESL.
The existing point (a) is deleted as it is moved to AMC1 ORA.FSTD.105(a)(4) as it relates to a configuration control requirement.
In point (d) clarification is added that the airworthiness directives (ADs) where the FSTD is qualified should equally be considered in addition to the AD from the State of the Design of the aircraft and the State where the FSTD is located.
Point (e) is deleted as it already stated in point ORA.FSTD.110(b).
Point (f) is deleted as it becomes obsolete, considering the exhaustive AMC2 ARA.FSTD.130 which defines the criteria for the competent authority to decide on a special evaluation.

AMC1 ORA.FSTD.110(a) Modifications

RELOCATION OF FSTD

When an FSTD is moved, the organisation should inform the competent authority before the planned activity along with a schedule of related events. Prior to returning the FSTD to service at the new location, the organisation should perform at least one third of the objective tests, and functions and subjective tests to ensure that the FSTD performance meets its original qualification basis. A copy of the test documentation should be retained together with the FSTD records for review by the competent authority.

Rationale:

The new AMC is based on the existing requirement in point (c) to ORA.FSTD.230. The proposal is to delete the requirement from the hard law (point ORA.FSTD.230(c) and integrate it as AMC with the rationale that the new point ORA.FSTD.110 treats relocation of FSTD as a major modification and describes the process to be followed. The AMC proposes that the organisation operating the FSTD should perform certain portion of tests prior to returning the FSTD to service at the new locations to ensure that the FSTD meets the original qualification basis. This is considered as a clarification to the process for relocation of FSTD and therefore it is proposed at AMC level.

AMC1 ORA.FSTD.110(b)(2) Modifications

MANAGEMENT OF MAJOR MODIFICATION WITHOUT PRIOR APPROVAL

(a) When an organisation operating the FSTD implements a major modification in accordance with point ORA.FSTD.110 (b)(2), it should clearly define lines of responsibility for the implementation of the modification.

(b) The procedure as referred in point ORA.FSTD.110 (b)(2) should be part of the organisation management system and meet at the least the following:

(1) the modification without prior approval should be part of the configuration control management of the organisation;

(2) the depth of the acceptance tests should be adapted to the nature of the modification and the impact on the qualified FSTD;

(3) assigned personnel for internal acceptance of the modification should be suitably trained and qualified, in accordance with criteria established by the organisation;

(4) the competent authority should be informed of the modification with the letter of compliance as referred in AMC1 ORA.FSTD.110(c)(4).

(5) the modification should be accurately documented and archived in accordance with ORA.FSTD.240 and be available on request by the competent authority.

(c) The procedure should have a clear scope of a major modification. If the organisation wishes to extend the scope of the modification subject to the procedure as referred in point ORA.FSTD.110(b)(2), the procedure should be amended accordingly to reflect the activity related to that modification.

Rationale:

The proposed amendments in the hard law allow that an organisation operating the FSTD implements a major modification without a prior approval, provided that it manages such modification based on the procedure approved by the competent authority.

The new AMC provide details on the content of the procedure which an organisation operating the FSTD should follow if a major modification of FSTD is managed in accordance with point ORA.FSTD.110 (b)(2).

GM1 ORA.FSTD.110(b)(2) Modifications

QUALIFICATION OF ASSIGNED PERSONNEL FOR ACCEPTANANCE OF A MAJOR MODIFICATION WITHOUT PRIOR APPROVAL

(a) The personnel assigned to perform internal acceptance of a major modification without prior approval performed in accordance with point ORA.FSTD.105 ORA.FSTD.110 (b)(2) should possess the following qualification:

(1) knowledge and relevant experience in the areas appropriate to their role and in the areas impacted by the modification;

(2) proven record of managing similar major modifications to the scope and complexity of the modification being undertaken;

(3) experience in verification of modifications, including test reports, engineering analysis, QTG tests, calibration records.

(4) experience in validation of modifications, including pilot evaluations, subject matter expert assessments, validation reports.

(b) The organisation operating the FSTD should ensure that the personnel assigned to perform a major modification without prior approval undergo appropriate training to remain current with technological advancements and regulatory requirements.

Rationale:

The GM is intended to support the organisation operating the FSTD to determine the necessary training and qualification of the assigned personnel to do internal acceptance of a major modification without prior approval. It is based on the industry best practice.

AMC1 ORA.FSTD.110(c)(4) Modifications

LETTER OF COMPLIANCE TO THE COMPETENT AUTHORITY

(a) An organisation operating the FSTD should submit to the competent authority a letter of compliance in case of a major modification to an FSTD performed in accordance with point ORA.FSTD.110(b).

(b) The letter of compliance should be sent when a modification is implemented and not later than 3 days after acceptance tests have been performed.

(Date) ……

FSTD ID number

Scope of the major modification: …….

Date of modification completion:

The modification is implemented based on:

☐ approval by the competent authority (point ORA.FSTD.110(b)(1)

☐ procedure approved by the competent authority (point ORA.FSTD.110(b)(2)

The FSTD has been assessed by the following evaluation team:

(Name)…… Pilot's Licence Nr and credentials: ……

(Name)…… FSTD technical specialist's credentials……

The organisation operating the FSTD declares that the major modification has been performed according to the applicable requirements. The tests performed demonstrate that following the modification, the FSTD complies with its qualification basis and applicable requirements, and that the modification has no negative impact on the use of the FSTD.

A change of the current FSTD qualification certificate is necessary: ☐ YES ☐ NO

The ESL has been updated based on the modification ☐ YES ☐ NO

The corresponding documentation to the modification is attached.

(Additional comments as required)
……
……
……

Name and signature of the FSTD compliance manager or delegate	
e-Mail	

Telephone	

Rationale:

After a major modification is implemented, the organisation operating the FSTDs shall declare to the competent authority that the FSTD complies with its qualification basis (ORA.FSTD.110(b)(4). To support this declaration, the AMC provides a letter of compliance that the modification is performed according to the applicable requirements and the FSTD compliance with the qualification basis.

The letter of compliance should be provided by the organisation operating the FSTD, regardless of the way they implement the modification (after obtaining an approval by the competent authority (ORA.FSTD.110(b)(1) or based on the procedure approved by the competent authority (ORA.FSTD.110(b)(2)).

GM1 ORA.FSTD.110 Modifications

RMT.0196

EXAMPLES OF MAJOR MODIFICATIONS

The following are examples of modifications that should be considered as major. This list is not exhaustive and modifications need to be classified on a case-by-case basis:

~~(a) any change that affects the QTG;~~

~~(b) introduction of new standards of equipment such as flight management and guidance computer (FMGC) and updated aerodynamic data packages;~~

~~(c) re-hosting of the FSTD software;~~

~~(d) introduction of features that model new training scenarios; e.g. airborne collision avoidance system (ACAS), EGPWS;~~

~~(e) aircraft modifications that could affect the FSTD qualification; and~~

~~(f) FSTD hardware or software modifications that could affect the handling qualities, performance or system representation.~~

(a) Any change affecting the FSTD Capability Signature (FCS);

(b) Any change which affects the handling of the simulated aircraft;

(c) Any change which affects the performance of the simulated aircraft;

(d) Any QTG test result which has changed because of tuning or change to the aerodynamic model;

(e) Any change to systems operation of the simulated aircraft;

(f) any modifications of the visual system which may affect the QTG results, such as the display hardware, mounting bracketry, replacement mylar or mirrors, projector model changes or image generator hardware/software changes;

(g) New design features on the aircraft (e.g. installation of a HUD);

(h) New Avionics features;

(i) Additional Options for a different engine (types / ratings);

(j) Updated Validation Data Roadmap (VDR);

(k) Any change in the ESL which affects training, testing and checking;

(l) Additional functionality on the aircraft or aircraft operations that require additional validation of the source data (e.g. auto-brakes with RTO; going from no auto-land capability to an auto-land capability);

(m) New equipment (e.g. use of EVS, NVG);

(n) An extension of the training envelope that requires new validation source data, or extension of its scope (e.g. UPRT, stall training, Helicopter External Sling Load Operations);

(o) Integration of new host computer(s);

(p) IOS Hardware / Software updates;

(q) Integration of new technology in the visual or motion, controls or vibration systems;

(r) Relocation and any de-activation/re-activation of an FSTD.

EXAMPLES OF MINOR MODIFICATIONS

The following are examples of modifications that should be considered as non-major. This list is not exhaustive and modifications need to be classified on a case-by-case basis:

(a) Navigation Databases (incl. FMS, Ground station, RDB, GPS Almanac);

(b) Terrain and Obstacle Databases;

(c) Updating, addition or removal of visual models;

(d) Control Loading Tuning when necessary to comply with MQTG baseline;

(e) Motion and Vibration Tuning when necessary to comply with the MQTG baseline;

(f) Cosmetic / Text changes to the MQTG;

(g) Lesson plans;

(h) Debriefing stations.

Rationale:

The GM is developed to provide examples and illustrate the distinction between major and minor modifications of an FSTD. The list is not exhaustive, and modifications need to be classified on a case-by-case basis.

AMC1 ORA.FSTD.115 Installations

RMT.0196

MINIMUM ELEMENTS FOR SAFE OPERATION

(a) Introduction

(1) This AMC identifies those elements that are expected to be addressed, as a minimum, to ensure that the FSTD installation provides a safe environment for the users and operators of the FSTD under all circumstances.

(b) Expected elements

(1) Adequate fire/smoke detection, warning and suppression arrangements should be provided to ensure safety ~~passage of personnel from the FSTD~~ of the users and the organisation operating the FSTD.

(2) Adequate protection should be provided against electrical, mechanical, hydraulic and pneumatic hazards, including those arising from the control loading and motion systems, to ensure maximum safety of all persons in the vicinity of and inside the FSTD.

(3) Other areas that should be addressed include the following:

(i) a two-way communication system that remains operational in the event of a total power and network failure;

(ii) emergency lighting of FSTD and building;

(iii) escape exits and escape routes properly identified and that remain visible in low-visibility conditions (power failure, smoke, etc.);

(iv) occupant restraints (seats, seat belts etc.);

(v) external warning of motion and access ramp or stairs activity;

(vi) danger area markings;

(vii) guard rails and gates;

(viii) ~~motion and control loading~~ emergency ~~stop~~ power-off controls ~~accessible from either pilot or instructor seats~~;

(ix) motion and control loading cutoff accessible from both pilot seats and the instructor seat;

(~~ix~~x) a manual or automatic electrical power isolation switch.

(xi) alternative emergency egress method.

Rationale:

Point (b)(1) is amended to provide clarity that the warning and suppression arrangements should be provided to ensure safety of the FSTD users and the organisation operating the FSTD. Point (b)(2) includes a slight change to stress the concept that the protection is both inside and in the simulator hall.

In point (b3) there are several light amendments in the existing text to support the safe operation (e.g. the network failure includes VoIP, data and phone network; proposal to have stop button outside in the vicinity of FSTD for promptly stop of the device, alternative emergency egress method, etc).

AMC1 ORA.FSTD.115(a)(4) Installations

(a) The organisation operating the FSTD should display the following documents in proximity of the FSTD either in hard copy or electronic copy:

(1) the FSTD qualification certificate;

(2) the equipment specification list (ESL);

(3) a list of open defects of that FSTD;

(4) a form for the FSTD users to file any issues identified during the use of the FSTD.

(b) The documents should be easily accessible by FSTD users and the authorities.

Rationale:

A new AMC is proposed to specify how and where the FSTD certificate and the ESL should be displayed and accessible. In addition, it specifies that the list of open defects should be in the proximity of the device and the means for the users to file any issues after they use the FSTD.

GM1 ORA.FSTD.115 Installations

RMT.0196

GENERAL

(a) The intent of ORA.FSTD.115 is to establish that the organisation operating an FSTD has all the necessary procedures in place to ensure that the FSTD installation remains in compliance with all requirements affecting the safety of the device and its users.

(b) Based on experience, the competent authority should pay particular attention to the quality of safety briefings on the FSTD provided to users and instructors, and to the execution of regular checks on the FSTD safety features. The organisation operating the FSTD should provide users and instructors with safety instructions specific for each device.

(c) It is recognised that certain checks, such as that of the emergency stop, can have adverse impact on the FSTD if carried out in full.

(d) It is acceptable to develop a procedure that protects elements of the device by shutting them down in advance, in a more controlled manner, provided it can be shown that the procedure still demonstrates the whole device can be shut down by the operation of a single emergency stop button, when required.

Rationale:

A new sentence is proposed in point (b) to ensure that the organisation operating the FSTD provides to users and instructors safety instructions specific for each FSTD.

GM2 ORA.FSTD.115 Installations

RECOMMENDED SAFETY FEATURE

The following items can be considered for attention:

(a) The access ramp or stairs:
  (i) is equipped with a back-up system to ensure operations during a building power failure;
  (ii) has a safety interlock that inhibit the motion system in case the ramp is extended;
  (iii) is inhibited in case the motion system is operating or is not in the rest position;

(b) is possible to evacuate from the FSTD also in case of:
  (i) the main exit door is unusable;
  (ii) the access ramp or stairs are unusable;

(c) Escape route marks (both from access ramp and emergency ladder) are correctly placed on the floor and walls;

(d) Protection devices covering protruding parts and sharp edges;

(e) A monitoring system to detect invisible molecules generated during pre-combustion stages of incipient fire inside and around the FSTD area;

(f) The fire/smoke alarm of the building is also replicated or audible from inside the FSTD;

(g) Emergency exits (opening outwards) are duly placed and identified and equipped with push bars;

(h) Emergency ways are free of obstacles;

(i) First aid kits are duly placed, identified and include the instructions for use;

(j) The above listed safety features and equipment are properly reported on the facility map posted within each building;

(k) There are not unusual temperatures, humidity and noises;

(l) The floors are intact and clean (no holes, leakages, irregularities, wrongly positioned cables or pipes or dirt that can endanger personnel);

(m) The restricted areas (e.g.. computer rooms, hydraulic room, pneumatic room, equipment room, Warehouse and labs) are identified to prevent unauthorized access;

(n) the peculiarities of each operating site (e.g. flooding, earthquake, proximity to Airports SID and STAR, railway);

(o) any aspect of novelty (e.g. new technology, new operations, new kind of installations), complexity or criticality that could impact the organisation or the training delivered in the FSTD by the users.

Rationale:

A new GM is proposed to outline items which can be considered for safety operation of the FSTD.

AMC1 ORA.FSTD.120 Equipment specification list

GENERAL

(a) The ESL is a document, prepared and issued by the organisation operating the FSTD for each FSTD qualification certificate, including legacy FSTD, except BITD in accordance with article 10b, point 4 of the current regulation.

(b) The FSTD qualification basis, the FSTD Capability Signature (FCS) and the Equipment specification list (ESL) together establish the suitability of the device to support a training program.

(c) The ESL defines the complete configuration of the FSTD in terms of aircraft make, model, series, engines, avionics, flight controls systems, flight instruments, radio communications, navigation systems, electronic flight bag, and any other installed equipment.

(d) The ESL is a summary of the capabilities and technical details of the FSTD and provides information to FSTD users (ATOs, AOC holders, examiners, others). When developing the training programme in accordance with Annex I (Part-FCL) to current Regulation or Annex III (Part-ORO) to Commission Regulation (EU) 965/2012, the FSTD user is responsible for determining overall adequacy of the FSTD in accordance with ORA.ATO.135 and ORO.FC.145 in achieving the training objectives. The ESL should be sufficiently detailed to allow the FSTD users to determine the suitability of the FSTD for training, testing and checking, and to establish a differences list where necessary.

(e) The organisation operating the FSTD should verify and validate each entry (equipment, capabilities and specifications) in the ESL and understand that each entry is a declaration that the feature / capability has been fully tested and complies with its qualification basis:

(1) during the acceptance testing prior to the initial evaluation in accordance with the management system of the organisation; and

(2) on an ongoing basis in accordance with point ORA.FSTD.105.

(f) The organisation operating the FSTD should establish a process to both verify and validate that the ESL is correct and accurately represents the FSTD.

(g) The organisation operating the FSTD should update the ESL to accurately represent the installed equipment, capabilities and specifications at all times. The ESL should be subject to management of modifications in accordance with point ORA.FSTD.110.

(h) Database revisions, should not be included in the ESL (such as Visual database/models, regular AIRAC-28 cycle updates to FMS, GPS, RNP AR, obstacle, terrain database etc.) since these are considered as minor updates. However, some database details which are relevant to the users of the device should be sufficiently described in the ESL (i.e. type of database, name and coverage area).

(i) For each entry made in the ESL, any associated limitation should be stated together with that entry.

Rationale:

The new AMC is dedicated to provide general clarifications to the ESL. The key points are:

- each FSTD certificate should be accompanied by ESL, including legacy FSTD, expect BITD;

- the ESL is the main document which specifies the complete configuration of the FSTD, the equipment, specifications, capabilities;

- the ESL, together with the FSTD certificate establish the suitability of the device to support a training program.

- the FSTD users should use the ESL as a main tool to determine the overall adequacy of the FSTD for training, testing, checking.

-the organisation operating the FSTD should verify and validate each entry (equipment, capabilities and specifications) in the ESL;

- ESL should be made available to the FSTD users and authorities;

- the organisation operating the FSTD should update the ESL to accurately represent the installed equipment, capabilities and specifications at all times;

-the ESL should be subject to management of modifications in accordance with point ORA.FSTD.110;

- database revisions, should not be included in the ESL (such as Visual database/models, regular AIRAC-28 cycle updates to FMS, GPS, RNP AR, obstacle, terrain database etc.) since these are considered as minor updates;

- ESL may indicate limitations of the FSTD related to relevant feature.

For existing FSTD which will be kept as "legacy" FSTD, it is assumed that the ESL would specify much better and clearly the equipment, capabilities of the FSTD used in the training, testing, checking. ESL for legacy FSTD would provide transparency of the FSTD to the user and the authorities, as some of these FSTD may get an assigned FCS and in this case the ESL would ensure that the users/authorities have a clear picture of the FSTD capabilities/limitations.

For existing FSTD which may be moved to the FCS framework and new FSTD which will be qualified under the new CS-FSTD, the ESL would visualise the equipment, specifications, capabilities which supports the fidelity level. The ESL would play a very significant role as some FSTDs may have the same fidelity, but not the same capabilities. In this case the ESL will provide details information to support the users and the authorities to understand the particular capabilities of each FSTD.

AMC2 ORA.FSTD.120 Equipment specification list

ESL template

Equipment specification list (ESL)

Pursuant to Commission Regulation (EU) No 1178/2011

The following information *is a summary of FSTD capabilities and provides information to FSTD users (ATOs, AOC holders, examiners, others) to allow them to determine the FSTD suitability for its use in training, testing, checking in accordance with point ORA.FSTD.120. When developing the training programme in accordance with Annex I (Part-FCL) to Commission Regulation (EU) No 1178/2011 or Annex III (Part-ORO) to Commission Regulation (EU) 965/2012, the FSTD user is responsible for*

determining overall usability of the FSTD in accordance with ORA.ATO.135 and ORO.FC.145 in achieving the training objectives.

Section 1: Organisation operating the FSTD information	
Operator name:	
Address:	
City / State:	
Country:	
Post code / ZIP:	
FSTD Location:	
Section 2: FSTD information	
FSTD Capability Signature: (XXXXXXXXXXXXXX) *Type / Level (if Legacy only)*	
FSTD serial number:	
EASA FSTD ID:	
Operator's FSTD ID:	
Primary Reference Document:	
Secondary Reference Document:	
FSTD manufacturer:	
Date of manufacture:	
Validation Data Roadmap:	

1: Flight Deck Layout and Structure (FDK)	**(S, R, G or N. Leave blank for legacy FSTD)**
2: Flight Control Forces And Hardware (CLH)	**(S, R, G or N. Leave blank for legacy FSTD)**
3: Flight Control Systems Operation (CLO)	**(S, R, G or N. Leave blank for legacy FSTD)**

4: Aircraft Systems (SYS)	**(S, R, G or N. Leave blank for legacy FSTD)**
5: Performance And Handling On Ground (GND)	**(S, R, G or N. Leave blank for legacy FSTD)**
6: Performance And Handling In Ground Effect (IGE)	**(S, R, G or N. Leave blank for legacy FSTD)**
7: Performance And Handling Out Of Ground Effect (OGE)	**(S, R, G or N. Leave blank for legacy FSTD)**
8: Sound cueing (SND)	**(S, R, G or N. Leave blank for legacy FSTD)**
9: Vibration Cueing (VIB)	**(S, R, G or N. Leave blank for legacy FSTD)**
10: Motion Cueing (MTN)	**(S, R, G. N Leave blank for legacy FSTD)**
11: Visual Cueing (VIS)	**(S, R, G. N Leave blank for legacy FSTD)**
12: Navigation (NAV)	**(S, R, G or N. Leave blank for legacy FSTD)**
13: Atmosphere And Weather (ATM)	**(S, R, G or N. Leave blank for legacy FSTD)**
14: Operating Sites And Terrain (OST)	**(S, R, G or N. Leave blank for legacy FSTD)**

Section 3: Miscellaneous	

[The organisation operating the FSTD] declares that the information contained in this document complies with the configuration of the FSTD and that all information in this ESL is accurate and comprehensive regarding the FSTD equipment, capabilities and specifications.

Name, date and signature of the person of the organisation operating the FSTDs nominated in accordance with ORA.GEN.210(b) or his/her delegate:

Section 4: *[FSTD ID]: [ESL Revision date], [ESL revision number]:*			
Name and signature of the FSTD compliance manager or delegate:		Date:	

Rationale:

The new AMC outlines the ESL template. The design of the template is purposely kept with blank boxes in order to allow that the information is accommodated for any FSTD (legacy FSTD without FCS or FSTD with FCS).

The template is organised by FSTD features with the rationale that in case of FSTD with FCS, the ESL will enable easy visualization of the equipment which supports the FSTD feature level. In case of legacy FSTD, the FCS of the FSTD will not be specified.

It is proposed that ESL also includes the FCS, with the rationale that this would be the link between the QC and ESL.

The ESL should indicate the FSTD qualification by specifying the FSTD FCS (in case of FSTD with FCS) or the FSTD type/level (in case of legacy FSTD). The ESL should specify the fidelity level (S, R, G, N) for each feature unless it is a legacy FSTD in which case the respective box should be left blank. The features are described in the CS-FSTD.

The template of the ESL provides only the structure which the organisation should follow. It cannot provide complete list of all possible equipment, specifications which FSTD could have due to a wide variety of FSTD. Therefore, the several GMs provide examples of ESL filled in for FSTD and expected level of depth and granularity. It is responsibility of the organisation operating the FSTD to organise the presentation of the FSTD equipment/specifications/capabilities in the ESL in order to enable the FSTD users to assess the suitability of the device for training, testing and checking.

Instructions how to complete the ESL template are provide in the AMC below.

AMC3 ORA.FSTD.120 Equipment specification list

INSTRUCTIONS FOR COMPLETION OF THE ESL

(a) The ESL should be designed to provide all relevant information about the FSTD equipment, capabilities and specifications which might be of use to FSTD users needing to conduct their own assessment prior to considering use of the device.

(b) The ESL should indicate the FSTD qualification by specifying the FSTD FCS (in case of FSTD with FCS) or the FSTD type/level (in case of legacy FSTD). The ESL should specify the fidelity level (S, R, G, N) for each feature unless it is a legacy FSTD in which case the respective box should be left blank. The features are described in the CS-FSTD.

(c) Information about aircraft make/model, version/revision of the equipment under each feature should be included if relevant for the applicable feature.

(d) The ESL should only include entries for those features or capabilities which exist. i.e. it is not necessary to enter a capability, followed by the word – 'No' or 'N/A'.

(e) The organisation operating the FSTD should describe:

(1) In section 1, Information about the organisation operating the FSTD and the actual location of the device.

(2) In section 2. "FSTD information" the FCS should be displayed, along with the details which are included in the template in AMC 2 ORA.FSTD.120. For FSTD compliant with MCC requirements, the MCC capability should be indicated in this section.

(3) In section 2.1 "Flight Deck Layout and Structure (FDK)", a summary of the device, the aircraft type/make/model/class, arrangement of equipment etc. The ESL should describe the flight deck and specify if elements which are touchscreen representation of an instrument or a control panel are included.

(4) In section 2.2 "Flight Control Forces And Hardware (CLH)", the installed primary and other flight controls equipment, e.g. type of input device, haptic feedback, active or passive flight controls, reversible or irreversible controls. Where applicable it should provide information about aircraft make/model, version/revision of the equipment. In case of FSTD with FCS, some flight controls forces and hardware may be at different fidelity level or are not installed. In this case, the highest fidelity level is appended with an asterisk (e.g. S*), as indicated in the FSTD qualification certificate. The fidelity of each flight control should be described to enable the FSTD user to determine the suitability for training, testing and checking.

(5) In section 2.3 “Flight Control Systems Operation (CLO)”, installed primary and other flight controls equipment, such as FBW version, conventional flight controls linkage, surface position for aeroplanes, blade angles for helicopters, flight control system operation modes and logics, flight and manoeuvre envelope protection functions, flight controls data revision as applicable.

(6) In section 2.4 “Aircraft Systems (SYS)”, all installed aircraft systems. A list of installed aircraft systems is required for legacy FSTD and for FSTD with FCS. Some aircraft systems may be at different fidelity level or are not installed. In this case, the highest fidelity level is appended with an asterisk (e.g. S*), as indicated in the FSTD qualification certificate. Each system not meeting the highest fidelity level, should be clearly declared at their actual fidelity level as part of the description of the system, to enable the FSTD user to determine the suitability for training, testing and checking. The information can be structured according to the applicable ATA chapters if deemed beneficial.

i. The inclusion of ‘revision’ or ‘part numbers’ for each system may be entered, where that information is needed to allow the user to identify differences to be trained. This is of particular importance when known issues with aircraft systems (on the aircraft being simulated) had been resolved and published with reference to that revision or part number.

ii. The OEM reference documentation refers to any Aircraft Flight Manual (e.g. AFM, RFM, Pilot’s Operating Handbook, FCOM, etc.). This should be included when the aircraft being simulated has some features modelled, which are based on such documentation which may be a revision(s) which does not reflect the most recent aircraft documentation. This could be of particular importance if the aircraft being simulated is modelled on a specific tail number.

iii. Approach capabilities should be declared here. It is essential that all applicable equipment and any features necessary to support each approach capability have been validated, prior to inclusion on this list. E.g. Visual scene content, FMS capabilities, installed Aircraft Equipment, Terrain Databases (validity and coverage), Terrain feedback, and Ground Navaids.

iv. If an approach capability has a lowered minima declared, due to the use of some special equipment, that equipment should also be specified in support of the declaration (e.g. CAT III RVR 75m- No DH because of HUD/HUGS/PVD/EVS etc.)

v. If any approach capability is limited to a specific Airport/Approach, that limitation should be included here. E.g. RNP AR "Limited to VNKT RNP Z RWY 02 (AR)".

vi. If an approach capability is declared without any known limitation, it is assumed to mean that the capability can be demonstrated and used at all operating sites without restriction. This should be substantiated by appropriate sample testing described in the organisation's management system.

vii. in addition to 'approach capabilities', any additional PBN capabilities can be mentioned here (e.g. 'Oceanic L1 RNP 4') if supporting features and equipment have been validated to support those capabilities.

(7) In section 2.5 "Performance And Handling On Ground (GND)", the source of the ground model, data / revision, attributes where applicable. In this section ZFW / MTOW / MLW, Runway Contaminants etc. could be mentioned.

(8) In section 2.6 "Performance And Handling In Ground Effect (IGE)", the source of the aerodynamic model, data / revision, attributes where applicable. Crosswind and tailwind limits can be specified here detailing any specifics regarding the simulation differences to the aircraft being simulated in order to inform the user.

(9) In section 2.7 "Performance And Handling Out Of Ground Effect (OGE)", the source of the aerodynamic model, data / revision, attributes where applicable. The ESL should specify under this feature whether the FSTD is approved for approach to stall or full/post stall and any information relating to UPRT specifics which would be useful for the user.

(10) In section 2.8 "Sound Cueing (SND)", the source of the model (aircraft type), data/revision where applicable and a basic hardware description.

(11) In section 2.9 "Vibration Cueing (VIB)", the source of the model, data/revision and degrees of freedom if a separate vibration platform/seat is installed.

(12) In section 2.10 "Motion Cueing (MTN)", the technology used, the revision of the model data, degrees of freedom, motion type and stroke length, as applicable.

(13) In section 2.11 "Visual Cueing (VIS)", the display type (e.g. collimated film, Collimated mirror, 10 ft Dome, etc.), field of view, projector technology, and any other attributes of the visual system or specific features necessary to inform the user. Contents of the visual databases / models should not be included here (See OST below).

(14) In section 2.12 “Navigation (NAV)”, refers to the simulation of the Ground Station Data / Radio Navaids Database and any GPS almanacs. The coverage area and the update frequency should be stated here along with any known limitations to the use of the FSTD. e.g. “Navaid coverage only accurate within 25nm of specified airport model”. Refer to the CS-FSTD (or applicable PRD) for further details. Note: Any charts associated with Navaids which are not kept up to date, should be annotated with the text “For training use only”.

(15) In section 2.13 “Atmosphere And Weather (ATM)”, all environment related capabilities of the device, useful to the users of the device should be mentioned. Paying attention to any peculiarities of the FSTD. Specifics regarding the Icing model should be summarised here based on the statement of justification (or SOC for Legacy) described in the MQTG.

(16) In section 2.14 “Operating Sites And Terrain (OST)“, relates to the contents of installed visual scenes (aka visual databases, visual models, real-world airports etc.). The installed Class 1 scenes used to support the qualification of the FSTD should be defined here, along with information on the Class 2 and Class 3 scenes as applicable.

i. Visual database revision numbers should not be included on the ESL. The ESL should not require a new revision when a visual database is replaced or removed.

ii. The addition of a new Visual database should only warrant an update to the ESL if a new capability is being declared. This would generally be a Class 3 visual database which would used to support a specific training scenario.

iii. Addition of IOS repositions to specific locations to enable training does not require a new ESL revision to be produced. (e.g. addition of Oil Rig, LVTO Apron/Gate etc.)

(17) In section 3. “Miscellaneous”, any other information useful to the users of the device can be mentioned here which is not tied to any of the above features.

i. The ‘Malfunction document’ revision is mentioned here to ensure that all users are using the most up to date document. If a system is in place which necessitates this revision being updated at a rate which makes this result in regular updates to the ESL, it should be omitted, but an alternative method of keeping all users informed should be employed. A similar approach could be taken to the mention of IOS user manuals or similar.

(f) In some cases, a single capability is supported by equipment which would be defined under multiple features (e.g. RNP AR, which is described by a combination of 'operating site and

terrain', 'aircraft systems' and navigation). The ESL entry for such capabilities should specify, for each affected feature, the equipment which validates the capability (e.g. for RNP-AR; the validated visual database / terrain model, the capability of the GPS simulation and TAWS, and the validated FMS database). A capability should only be entered in the ESL, when all elements required to support the capability have been validated by the organisation operating the FSTD. Entry of such a capability on the ESL is a declaration that such validated has been completed.

(g) In case additional equipment is installed for which qualification is not sought, such equipment may be listed in the ESL provided that it is clearly indicated:

(1) as additional equipment as referred in point ORA.FSTD.120(d); and

(2) it is not part of the FSTD qualification.

(h) The ESL should be signed by the person of the organisation operating the FSTDs nominated in accordance with ORA.GEN.210(b) or his/her delegate.

Rationale:

The AMC provides instructions how to complete the ESL and the level of granularity and details. The examples below encompasses variety of FSTD for aeroplanes, helicopters, for legacy FSTD, FSTD with FCS, features which may have elements are different fidelity level and asterisk is used, etc.

They have been developed to support the organisation operating the FSTD to understand how to complete an ESL.

GM1 ORA.FSTD.120 Equipment specification list

EXAMPLE OF ESL FOR LEGACY FFS(H) FSTD

Equipment specification list (ESL)
Pursuant to Commission Regulation (EU) No 1178/2011

Section 1:	**Organisation operating the FSTDs information**
Operator name:	Your Organisation
Address:	Principal place of business address
City / State:	Principal place of business address
Country:	Principal place of business address
Post code / ZIP:	Principal place of business address
FSTD Location:	(Address where FSTD is located)

Section 2:	**FSTD information**
Type / Level (Legacy):	HELICOPTER FFS Level D
FSTD serial number:	CDB-1234
EASA FSTD ID:	EU-A9999
Operator's FSTD ID:	FFS #4
Primary Reference Document:	CS-FSTD(H) initial issue
FSTD manufacturer:	Manufacturer (TDM)
Date of manufacture:	dd-mm-yyyy
Validation Data Roadmap:	X12345 Ver.X.X dd-mmm-yyyy
Multi-Crew Cooperation (MCC):	Yes

1:	**Flight Deck Layout and Structure (FDK)**
Feature summary:	Full scale replica of AW139 (NVG Cockpit), fully enclosed cockpit with onboard IOS (FFS Level D)
Aircraft type /make/model/class:	Leonardo AW139
Avionics:	Honeywell Primus Epic SW V. 7.4
Other:	Night Vision Goggle (NVG) compatible displays / lighting / visual system
Non-Simulated Area:	Fully Enclosed Cockpit, Pilot x 2, Instructor x 1, Observer x1, Observer Jumpseat x1

2:	**Flight Control Forces And Hardware (CLH)**

Feature Summary:	Tactile replication of all flight controls as per AW139 with 4-axis autopilot
Primary Controls	As per aircraft AW139 (Active flight controls)
Secondary Controls	As per aircraft AW139 (Active flight controls)
Engine Controls	As per aircraft AW139

3:	**Flight Control Systems Operation (CLO)**
Feature Summary:	Replication of all flight controls as per AW139 with 4-axis autopilot
Controls system:	4-Axis Dual Digital Automatic Flight Control System (DAFCS) with Autotrim Function

4:	**Aircraft Systems (SYS)**
Feature Summary	All systems of AW139 fully replicated
AFM (RFM) reference:	AW139 Rotorcraft Flight Manual Rev.xx Date:xx 'Honeywell Primus 701 (Terrain, WX & ARA), RFM supplement X'
Engine:	2 x Pratt & Whitney PT6C-67C Turboshafts with FADEC
Autopilot:	4 channels AFCS with SAR modes
Flight Director:	V-Bar / X-Bar Selectable via APM Changeout
Communications:	ACP / RMU modelled by TDM with 8.33kHz spacing
GPS:	Dual CMA 4024 GPS w/ SBAS
FMS:	2 x Honeywell SW NZ 7.01
FMS Database	Europe/MEA regional FMS Database coverage.
WX radar:	Honeywell Primus 701 (Terrain, WX & ARA)
TAWS:	EGPWC MkXXII: **European Database Only**
Pressurisation:	As per Aircraft
Brakes:	Steel brakes modelled by OEM
Hydraulics:	As per Aircraft
Icing:	AW139 Full Ice Protection System (FIPS)
Standby instrumentation:	BF Goodrich 501-1860-0601
Transponder:	Mode-S; ADS-B
GPS:	SBAS
VOR:	As per aircraft
NDB:	Circling approach validated at KTEB to KJFK 04
Markers:	As per aircraft
Floatation devices	Modelled as per Aircraft
Approach Capabilities:	

ILS CAT I:	Yes – 550m – 200ft DH
LVP / LVTO:	150m
PBN	RNP APCH; LNAV; LNAV/VNAV

5: Performance & Handling - On Ground (GND)	
Model:	TDM Ground Model; Version 1.0
MTOW	15,430 lb
Fuel Capacity:	3611 lbs

6: Performance & Handling - In Ground Effect (IGE)	
Model:	OEM Aero Model Ver. 2.1
Max. Demonstrated X-Wind:	Offshore Operations, both in PC2e and Cat A, is 20 kts as maximum lateral wind component
Wind Surface Friction:	Effect modelled – xwind 70% on surface
7: Performance & Handling - Out Of Ground Effect (OGE)	
Model:	OEM Aero Model Ver. 2.1

8: Sound Cueing (SND)	
Aircraft sound source data:	Leonardo Sound gathering Date:xx
Manufacturer:	Crown Amplifier / JBL Speaker, 10 Channel Directional Sound system

9: Vibration Cueing (VIB)	
Platform:	3 DOF Vibration Platform, Electric

10: Motion Cueing (MTN)	
Manufacturer/model:	MOOG Inc.; Gen.2
Type / Stroke	6-DOF Electric / 60”

11: Visual Cueing (VIS)	
Visual display type:	Direct Projection 10’ Dome
Field of View:	FOV: 220º x 65º
Projectors:	Barco SIM7Q – LcoS (8 projectors)
NVIS:	NVIS compatible visual projectors – NVIS scenes selectable via IOS (NV Goggles not provided)
Visual Ground Segment (VGS):	LSZH 28

Features:	Controllable traffic included for TCAS events, randomised traffic and take-off / landing scenarios.
Features:	Various moving Ground Traffic models; including runway incursion events and dynamic Emergency Vehicle scenario on Touchdown.
Cockpit display feature:	Load lifting / Hoist camera simulated and displayed on cockpit display unit.

12:	**Navigation (NAV)**
Ground Station Data Navaids:	Jeppesen provided data; Accurate within 25nm of LSZH, EDDF, LFPO, EIDW
Update schedule	Updated on AIRAC-28 day cycle

13:	Atmosphere And Weather (ATM)
Model:	TDM Generic Weather Model Rev.35a
Wind Control:	Surface, intermediate, upper selectable. Backs/Veers realistically with hemisphere.
Pressure:	hPa / inHg selectable
Temperature:	ºC / ºF selectable.
Weather presets:	EASA, FAA selectable
Clouds:	FEW, SCT, BKN, OVC, Cirrus. 3 adjustable layers.
Storms:	TDM Storm Models 1-8
Predictive Windshear:	WXR capable
Turbulence types:	Linked to Surface and Upper Wind selections Cobblestone, Rough Air, Wake Turbulence scenarios
Precipitation:	Rain, Hail, Snow, Ice
Icing:	Selectable via IOS, Fully Iced = 196 lbs
Runway Contaminants:	Dry, Patchy, Wet, Standing Water, Ice Patches, Full Ice on Runway. (Stopping distance is linked to contaminant selection)
Other Contaminants:	Brownout, Whiteout, Downwash, Blowing snow, Blowing Sand
Microburst:	Scenarios Modelled
W/S scenarios	T/O and Landing; Severe is non-survivable; Moderate is survivable; No Windshear Warning System / No PWS installed

14:	Operating Sites And Terrain (OST)		
Visual Scenes:	Class 1; LSZH – EGKK - EDDF		
	Class 2: See operator for full list of available visual databases		
	Class 3: All special training scenarios requiring class 3 visual scenes are listed below.		
Winter scenes:	Visual capable: see operator visual database list for full list.		
VFR Navigation:	EIDW, EGLC (50nm radius), EIWF (25nm radius)		
Airborne Radar Approach (ARA):	OMAA	Oil Rig 'Charlie'	N24.5467, E054.2441
HEMS:	KJFK	Medical Scenario at UMH	N40.7415, W073.9845
Police Chase Scenario:	KJFK	Newark Area	N40.7583, W074.1562
Sloped T/O landing:	EIDW	Phoenix Park Monument	N 53.3566, W006.3285
Confined Area:	KJFK	New York Dockside	N40.7554, W074.0067
Ship landing:	OMDB	Ship name 'Sea Rose'	>10nm OMDB
Rig landing:	OMAA	Oil Rig 'Charlie'	N24.5467, E054.2441
Elevated platform landing:	OMDB	Burj Al Arab	N25.1413, E055.1852
3D Ocean:	OMDB – 150 Nm radius		

Section 3: Miscellaneous			
Occupancy	Pilot x 2, 1x Instructor, 1 Observer, 1 Jumpseat.		
Malfunction reference document:	AW139 Malfunctions_Rev.xx dd-mmm-yyyy		
Instructor operating station:	Onboard, 2 Touchscreens, 1 Tablet. Debriefing station available with playback.		
Computer system:	Host: Quantum bit power 5200		
Lesson plans	available		
Snapshot:	FMS Save/Recall available		
Fire Detection / Suppression:	1 x Fire Extinguisher	Building fire flashing alarm	
Emergency Egress:	2 x Motion/CL OFF 1 x Emerg. Power OFF	Manual Drawbridge Override	Kick-out panel Escape ladder

[The organisation operating the FSTD] declares that the information contained in this document complies with the configuration of the FSTD and that all information in this ESL is accurate and comprehensive regarding the FSTD equipment, capabilities and specifications.

Name, date and signature of the person of the organisation operating the FSTDs nominated in accordance with ORA.GEN.210(b) or his/her delegate:

Section 4: *ESL-EU-9999, dd-mmm-YYYY, Rev.x.x*			
Name and signature of the FSTD compliance manager or delegate:		Date:	

GM2 ORA.FSTD.120 Equipment specification list

ESL EXAMPLE FOR FSTD WITH FCS

Equipment specification list (ESL)

Pursuant to Commission Regulation (EU) No 1178/2011

Section 1:	**Organisation operating the FSTDs information**
Operator name:	Your Organisation
Address:	Principal place of business address
City / State:	Principal place of business address
Country:	Principal place of business address
Post code / ZIP:	Principal place of business address
FSTD Location:	Address where FSTD is located

Section 2:	**FSTD information**
FSTD Capability Signature:	**S S S S S S S S S S S S**
FSTD serial number:	123456
EASA FSTD ID:	EU-A9999
Operator's FSTD ID:	A320FFS1
Primary Reference Document:	CS-FSTD
Secondary Reference Document:	n/a
FSTD manufacturer:	Manufacturer x
Date of manufacture:	dd-mm-yyyy
Validation Data Roadmap:	VDR Rev xxx.xx Dated: dd-mm-yyyy
MCC	Yes
Limitations:	Standby Altimeter displays in metres only

1:	**Flight Deck Layout and Structure (FDK)**	**S**
Feature summary:	Physical full scale replica of A320-200 enclosed cockpit with onboard IOS	
Aircraft type / variant	Airbus A320-CEO	Airbus STD 2.0.0
Notes	CB Panel aft of Copilot is mounted on a moveable bulkhead which also includes an aircraft jumpseat. This can be rotated into a 'stowed' position perpendicular to the normal position to allow greater visibility to the observer(s).	

2:	Flight Control Forces And Hardware (CLH)	S
Feature summary:	Tactile replication of all flight controls as per A320-200	
Primary Controls:	As per Airbus A320-200	
Secondary Controls:	As per Airbus A320-200	
Engine Controls:	Airbus A320 Thrust lever assembly (replica)	
Reversible controls (Yes/No) :	No	

3:	Flight Control Systems Operation (CLO)	S
Feature summary:	A320-200 FBW EFCS	
ELAC:	Thales Standard, STD L98H, S/W: 3945129110 (Rehost)	
SEC:	Thales Standard, STD 126, P/N B372CAM0104 (Rehost)	
FCDC:	Litef Standard, STD 59, P/N 115370-1521, LITEF (Simulated)	
FAC:	THALES, AA05, P/N C13206AA00 (Simulated)	
SFCC	DIEHL AEROSPACE (software simulation), STD 11, 200301E00000308 (Simulated)	
Brakes:	Airbus BSCU V5.6 Carbon Brakes	

4:	Aircraft Systems (SYS)		S
Feature summary:	All systems of A320-200 fully replicated		
OEM reference documentation:	A320 Aeroplane Flight Manual Rev.xx dd-mm-yyyy A320 FCOM Rev.xx dd-mm-yyyy		
Primary Engine Type / Thrust:	CFM56-5B4 (A320-214)	27,000 lbf (120 kN)	
Alternate Engine Type /Thrust:	IAE V2527-A5 (A320-232)	24,800 lbf (110 kN)	
Avionics Std/Rev:	A320-200 STD 2.0.0		
Autopilot:	FCU: Simulated THALES EMM, level/Std. 4, reference P/N C12850AC03		
MCDU:	Honeywell, level/Std. V800, ref.C19266EA01 (Simulated)		
FMS:	FMGC Thales Release 1A	CFM: STD S7APC16; P/N C13208AA05.	IAE: STD S7API15; P/N C13208BA00
FMS Databases:	Worldwide AB42xxxx; User NavDB loaded on request.		
Display Management Computer:	EIS2 Standard STD13.2, P/N SXT4EXEESAX1320, Thales (Rehost)		
Flight Warning Computer:	FWC STD H2-F9D (Simulated)		
Cockpit Display Units:	A320 STD 2.0.0 Display Units (Simulated)		
System Data Acquisition Concentrator:	STD H2-E4, P/N 350E5500206, Airbus (Simulated)		
Inertial Reference System:	BLOCK III BE04, OPS S/W Std, L4.4, Honeywell (Simulated)		
GPS:	MMR GLU 925 -430, Std.x.x, Rockwell Collins (Simulated)		
Communications:	A320 ACP/RMP (Simulated by TDM Ver. Xxx)		

WX radar / PWS:	Honeywell WXR / PWS (Simulated by TDM Ver. Xxx)	
TAWS:	EGPWS Honeywell MKV-A, P/N 69000942-151 (Simulated)	
EFB Class:	Class 2 - available on request	
Air Data System:	Replica A320-200 (Simulated by TDM Ver. Xxx)	
Pressurisation:	Replica A320-200 (Simulated by TDM Ver. Xxx)	
Landing Gear:	Crane Enhanced LGCIU, P/N 80-178-03- 88013 (Simulated by TDM)	
Brakes:	Airbus BSCU V5.6 Carbon brakes (modelled by OEM)	
Hydraulics:	Replica A320-200 (Simulated by TDM Ver. Xxx)	
APU:	GTCP 131-9A, AMDTSS19, HONEYWELL GARRETT (Simulated)	
Standby instrumentation:	Thales ISIS V2 Replica of EA01, P/N C16786EA01 (Simulated)	Limitations: Standby Altimeter displays in metres only
De-icing systems:	Replica A320-200 (Simulated by TDM Ver. Xxx)	
Transponder / TCAS:	(TCAS II 7.1) Honeywell T3TCAS STD 2 (ADS-B selectable) (Simulated)	
Approach Capabilities:		
ILS CAT I:	Yes – 550m – 200ft DH	
ILS CAT II:	Yes – 300m – 100ft DH	
ILS CAT III (lowest minimum):	Yes - 75m - No DH	
LVP / LVTO:	125m	EDDF DEP: U-S-S11-R-S28-S-RWY18
PBN:	RNP APCH; LNAV; LNAV/VNAV; AR	
GLS:	Yes – as per A320-200	
SLS:	Yes – as per A320-200	
RNP AR:	RNP AR capable to RNP AR 0.1 minima as per A320-214	Limited to VNKT RNP Z RWY 02 (AR)

5:	**Performance And Handling On Ground (GND)**		**S**
Model:	Training device manufacturer (TDM) Ground Model, Version 4.1.0		
ZFW / MTOW / MLW	60,500 kg (133,380 lbs)	78,000 kg (171,961 lbs)	66,000 kg (145,505 lbs)
Runway Contaminants:	wet, patchy wet, standing water, ice, patchy ice, (stopping distance automatically affected)		

6:	**Performance And Handling In Ground Effect (IGE)**	**S**
Model:	A320 Aerodynamic Model (NFL 5.6)	
Max. Demonstrated X-Wind:	38 knots (gust included) @ 10m AGL	
Max tailwind:	15 knots	
Wind Surface Friction:	Effect modelled – xwind 70% on surface	
Long Flare:	Yes - Driven by Malfunction	

Bounced Landing:	Yes

7:	Performance And Handling Out Of Ground Effect (OGE)	S
OGE Model:	A320 Aerodynamic Model (NFL 5.6)	
UPRT:	Full/Post Stall; Dynamic and Static scenarios available;	
	Automatic Stall Entry feature available; Crash limits +2.5G / -3G	

8:	Sound Cueing (SND)	S
Aircraft sound source data:	Airbus A320-214 (CFM) sound package OEM Ver.x.x Airbus A320-232 (IAE) sound package OEM Ver.x.x	
Manufacturer:	Directional 11 channel sound system	
Hardware:	Crown Amplifier / JBL Speakers	

9:	Vibration Cueing (VIB)	S
Model:	Vibration cues replicated based on Airbus A320-200 data package OEM Ver.x.x	

10:	Motion Cueing (MTN)	S
Model	TDM Motion model Ver. x.x	
Manufacturer	MOOG Inc. Gen.2 EMM	
Type / Stroke:	6-DOF Electric / 54”	

11:	Visual Cueing (VIS)	S
Visual display type:	Collimated film mirror	
Field of View:	200º x 40º (+15º / -25º)	
Projectors:	Panasonic - LCoS Laser	
Features:	Various airborne traffic included for TCAS events and randomised traffic (ADS-B selectable)	
Features:	Various moving Ground Traffic models; including runway incursion events and dynamic Emergency Vehicle scenario on Touchdown.	

12:	Navigation (NAV)	S
Ground Station Data Navaids:	All Worldwide NAVAIDS associated with Runway lengths above 1000m available	
Update schedule:	Updated on AIRAC-28 day cycle	

13:	Atmosphere And Weather (ATM)	S
Wind Control:	Surface, intermediate, upper selectable. Backs/Veers automatically with hemisphere.	

Pressure:	hPa / inHg selectable	
Temperature:	ºC / ºF selectable	
Weather presets:	EASA, FAA presets available	
Clouds:	FEW, SCT, BKN, OVC. 3 adjustable layers.	
Storms:	TDM Storm Models	
Predictive Windshear:	Scenarios available	
Windshear scenarios (Non-Predictive):	T/O and Landing at all airports	Severe is non-survivable; Moderate is survivable
Turbulence types:	Linked to Surface and Upper Wind selections Cobblestone, Rough Air, Wake Turbulence scenarios	
Volcanic ash:	Malfunction driven scenario available	
Precipitation:	Rain, Hail, Snow, Ice, blowing snow, blowing sand	
Icing:	Engine Cowl Ice Modelled Fan Blade Vibrations modelled – shedding above 80% N1 Wing Ice – 200lbs at 100% Total Ice weight at 100%: 460lbs. OEM Model IC45xx.3	
Microburst:	Microburst modelled at all airports	

14:	**Operating Sites And Terrain (OST)**		**S**
Visual Scenes:	Class 1; LSZH – EGKK - EDDF		
	Class 2; See operator for full list of available visual databases and their capabilities features.		
	Class 3; VNKT		
Winter scenes:	Visual capable: see operator visual database list for full list.		
VFR Navigation (Geo-specific content):	LSZH – EGKK - EDDF		
Section 3:	**Miscellaneous**		
Occupancy:	Pilot x 2, 1x Instructor, 1 Observer, 1 Jumpseat.		
Malfunction reference document:	A320_Malfunctions_Rev.xx		
Computer system:	Host: Quantum bit power 5200		
Lesson plans:	Available		
Smoke:	5 min Arm period; 7 min Run period; 10 Minute extract period		
Snapshot:	FMS Save/Recall only		
Fire Detection / Suppression:	1 x Fire Extinguisher	Building Alarm Aural repeater	
Emergency Egress:	2 x Motion/CL OFF 1 x Emerg. Power OFF	Manual Drawbridge Override	Kick out panel and Escape Rope fitted

[The organisation operating the FSTD] declares that the information contained in this document complies with the configuration of the FSTD and that all information in this ESL is accurate and comprehensive regarding the FSTD equipment, capabilities and specifications.

Name, date and signature of the person of the organisation operating the FSTDs nominated in accordance with ORA.GEN.210(b) or his/her delegate:

Section 4: *ESL-EU-9999, dd-mmm-YYYY, Rev.x.x*			
Name and signature of the FSTD compliance manager or delegate:		Date:	

GM3 ORA.FSTD.120 Equipment specification list

ESL EXAMPLE FOR FSTD (FNPTII) WITH FCS

Equipment specification list (ESL)

Pursuant to Commission Regulation (EU) No 1178/2011

Section 1:	**Organisation operating the FSTDs information**
Operator name:	Your Organisation
Address:	Principal place of business address
City / State:	Principal place of business address
Country:	Principal place of business address
Post code / ZIP:	Principal place of business address
FSTD Location:	Address where FSTD is located

Section 2:	**FSTD information**
FSTD Capability Signature:	**G G G G G G G G N N G R G G**
FSTD serial number:	123456
EASA FSTD ID:	EU-A9999
Operator's FSTD ID:	GA7FNPTII
Primary Reference Document:	CS-FSTD
FSTD manufacturer:	Manufacturer x
Date of manufacture:	dd-mm-yyyy
Validation Data Roadmap:	Rev xxx.xx Dated: dd-mm-yyyy
MCC	Yes
Limitations: None	

1:	**Flight Deck Layout and Structure (FDK)**	**G**
Feature Summary	Fixed base Multi-Engine Piston training device with partially enclosed cockpit	
Aircraft type / variant:	Generic MEP	Wake Turbulence Category: Light

2:	**Flight Control Forces And Hardware (CLH)**	**G**
Primary Controls	Dual Control with dynamic force feedback based on IAS and Environment	
Secondary Controls	Replica of GA7 pitch trim wheel	

Engine Control	Representative of GA7 throttle assembly (Throttle, RPM, Mix)
Reversible controls	Yes
Flaps	Touchscreen control characteristic of GA7 flap lever

3: Flight Control Systems Operation (CLO)	**G**
Feature Summary	Systems operation based on a Grumman GA7
Flight controls type:	Conventional Mechanical (reversible) controls with mechanical trim on all 3 axes
Steering:	Nosewheel steering only
Brakes:	Steel Brakes

4: Aircraft Systems (SYS)	**G**
Engine Type / Thrust:	Analog instruments representative of (2) Lycoming O-360-A1G6 engines 180 hp (134 kW)
Instruments:	DUAL Conventional Analog instruments for MEP Class, characteristic of GA7.
Autopilot:	3-axis MEP
Communications	Communications system characteristic of GA7.
Anti-icing / De-icing:	Anti-ice system characteristic of GA7.
Approach Capabilities:	
ILS CAT I:	Yes – 550m – 200ft DH
PBN:	RNP APCH; LNAV; LNAV/VNAV
Circling approach:	Yes

5: Performance And Handling On Ground (GND)	**G**
Model:	TDM Ground Model, Version 1.0 Empty weight: 2,569 lb (1,165 kg) Gross weight: 3,800 lb (1,724 kg)

6: Performance And Handling In Ground Effect (IGE)	**G**
Model:	TDM Aero model Rev x.x Date dd-mmm-yyyy
Crosswind limits:	Max. demonstrated 15 KIAS

7: Performance And Handling Out Of Ground Effect (OGE)	**G**
Model:	TDM Aero model Rev x.x Date dd-mmm-yyyy Wake turbulence category light. Low wing configuration Maximum speed: 168 KIAS (V_{NE}188 KIAS) Service ceiling: 17,400 ft (5,300 m)). Engines located on wings, contra-rotating propellers.

8:	Sound Cueing (SND)	G
Sound	Characteristic of MEP class	

9:	Vibration Cueing (VIB)	N

10:	Motion Cueing (MTN)	N

11:	Visual Cueing (VIS)	G
Visual Display Type:	Direct projection	
Field of View:	FOV: 50º x 35º FOV	
Projectors	2x Panasonic - LCoS	
Capabilities:	Day, Dusk, Night; Runway contaminants Dry, Wet.	

12:	Navigation (NAV)	R
Ground Station Data Navaids:	Accurate within 25nm range of EIDW, EICK, EIWF, EDDM and EDDK	
Update schedule	Manually updated from AIP every 3 months	

13:	Atmosphere And Weather (ATM)	G
Wind Control:	Surface, intermediate	
Pressure:	hPa / inHg selectable	
Temperature:	ºC / ºF selectable.	
Weather presets:	EASA	
Clouds:	FEW, SCT, BKN, OVC. 1 adjustable layer	
Icing	Wing and Body Ice modelled	

14:	Operating Sites And Terrain (OST)	G
VFR:	1:500000 Validated 25nm radius of EIDW	
Section 3:	**Miscellaneous**	
Malfunction reference document:	Generic_Malfunctions_Rev.xx	
Computer system:	Host: Quantum bit power 5200	
Occupancy:	Pilot x 2, 1x Instructor, Device located in fully enclosed and darkened area with offboard IOS	
Instructor Operating Station	2 touchscreen IOS	

[The organisation operating the FSTD] declares that the information contained in this document complies with the configuration of the FSTD and that all information in this ESL is accurate and comprehensive regarding the FSTD equipment, capabilities and specifications.

Name, date and signature of the person of the organisation operating the FSTDs nominated in accordance with ORA.GEN.210(b) or his/her delegate:

Section 4: *ESL-EU-9999, dd-mmm-YYYY, Rev.x.x*			
Name and signature of the FSTD compliance manager or delegate:		Date:	

GM4 ORA.FSTD.120 Equipment specification list

ESL EXAMPLE FOR FLAT PANEL FSTD WITH FCS

Equipment specification list (ESL)

Pursuant to Commission Regulation (EU) No 1178/2011

Section 1:	**Organisation operating the FSTDs information**
Operator name:	Your Organisation
Address:	Principal place of business address
City / State:	Principal place of business address
Country:	Principal place of business address
Post code / ZIP:	Principal place of business address
FSTD Location:	Address where FSTD is located

Section 2:	**FSTD information**
FSTD Capability Signature:	**R N R S* N G G N N N N R G G**
FSTD serial number:	123456
EASA FSTD ID:	EU-A9999
Operator's FSTD ID:	737FTD1
Primary Reference Document:	CS-FSTD
FSTD manufacturer:	Manufacturer x
Date of manufacture:	dd-mm-yyyy
Validation Data Roadmap:	VDR Rev xxx.xx Dated: dd-mm-yyyy

1:	**Flight Deck Layout and Structure (FDK)**	**R**
Feature Summary:	Flat Panel (Touchscreen) without tactile controls or switches placed in an open classroom	
Aircraft type / Variant	B737-800	

2:	Flight Control Forces And Hardware (CLH)	N

3:	Flight Control Systems Operation (CLO)	R
Feature Summary:	Representative of B737-800	

4:	Aircraft Systems (SYS)		S*
Feature Summary:	All specific systems are mentioned below. The generic systems are marked below with an asterisk (*)		
AFM (RFM) reference:	B737 Aeroplane Flight Manual Rev.xx dd-mm-yyyy		
Primary Engine Type / Thrust:	CFM 56-7B (27K)	27,000 lbf (120 kN)	
Common Display System:	Honeywell, Block point xx, simulated (re-targeted)		
Autopilot:	Honeywell SP300 (-7 FCC, -710 software)		
CDU:	Simulated Honeywell, level/Std. V800, ref.C19266EA01		
FMS:	Dual FMC, General Electrics, Load 10.8A, simulated (re-targeted)		
GPS:	Rockwell Collins GLU-925 multimode receiver (MMR)		
ACARS:	Allied Signal Avionics (software AMU)		
EGPWS:	Honeywell (hardware)		
RAAS (*Generic)	*Generic RAAS callouts provided		
Approach Capabilities:			
ILS CAT I:	Yes – 550m – 200ft DH		
ILS CAT II:	Yes – 300m – 100ft DH		
ILS CAT III (lowest minimum):	Yes - 75m - No DH		
LVP / LVTO:	125m	EDDF DEP: U-S-S11-R-S28-S-RWY18	
PBN:	RNP APCH; LNAV; LNAV/VNAV; AR		
RNP AR:	RNP AR capable to RNP AR 0.1 minima as per B737	Limited to VNKT RNP Z RWY 02 (AR)	

5:	Performance And Handling On Ground (GND)	N

6:	Performance And Handling In Ground Effect (IGE)	G
Model:	B727 Aerodynamic Model	

7: (OGE)	Performance And Handling - Out Of Ground Effect	G
Model:	B737 Aerodynamic Model	

8:	Sound Cueing (SND)	N

9:	Vibration Cueing (VIB)	N

10:	Motion Cueing (MTN)	N

11:	Visual Cueing (VIS)	N

12:	Navigation (NAV)	R
Ground Station Data Navaids:	All Worldwide NAVAIDS associated with Runway lengths above 1000m available	
Update schedule	Updated on AIRAC-28 day cycle	

13:	Atmosphere And Weather (ATM)	G
Wind Control:	Surface, intermediate	
Pressure:	hPa / inHg selectable	
Temperature:	ºC / ºF selectable	
Weather presets:	ICAO, EASA, FAA presets available	
Storms:	TDM Storm Models 1-8	
Predictive Windshear:	Scenarios available	

14:	Operating Sites And Terrain (OST)	R
Note:	The FSTD is not fitted with a visual system. The approach capabilities were validated to the extent that the aircraft system behaviour can be partially trained.	
Section 3:	**Miscellaneous**	
Malfunction reference document:	B737_Malfunctions_Rev.xx dd-mmm-yyyy	
Computer system:	Host: Quantum bit power 5200	
Occupancy	Pilot x 2, 1x Instructor (Structure floor mounted in classroom environment)	
Instructor Operating Station	2 touchscreens + 1 remote tablet	

[The organisation operating the FSTD] declares that the information contained in this document complies with the configuration of the FSTD and that all information in this ESL is accurate and comprehensive regarding the FSTD equipment, capabilities and specifications.

Name, date and signature of the person of the organisation operating the FSTDs nominated in accordance with ORA.GEN.210(b) or his/her delegate:

Section 4: *ESL-EU-9999, dd-mmm-YYYY, Rev.x.x*			
Name and signature of the FSTD compliance manager or delegate:		Date:	

GM5 ORA.FSTD.120 Equipment specification list

ESL EXAMPLE FOR FSTD (WITH SOME TACTILE CONTROLS/PANELS) WITH FCS

Equipment specification list (ESL)

Pursuant to Commission Regulation (EU) No 1178/2011

Section 1:	**Organisation operating the FSTDs information**
Operator name:	Your Organisation
Address:	Principal place of business address
City / State:	Principal place of business address
Country:	Principal place of business address
Post code / ZIP:	Principal place of business address
FSTD Location:	Address where FSTD is located

Section 2:	**FSTD information**
FSTD Capability Signature:	**R R* G S* S S R R G R R S G R**
FSTD serial number:	123456
EASA FSTD ID:	EU-A9999
Operator's FSTD ID:	A320FTD1
Primary Reference Document:	CS-FSTD
Secondary Reference Document:	xxx
FSTD manufacturer:	Manufacturer x
Date of manufacture:	dd-mm-yyyy
Validation Data Roadmap:	VDR Rev xxx.xx Dated: dd-mm-yyyy

1:	**Flight Deck Layout and Structure (FDK)**	**R**
Feature Summary	Flat panel training device with some tactile controls and panels	
Aircraft type / variant:	Airbus A320-CEO	Airbus STD 1.9

2:	**Flight Control Forces And Hardware (CLH)**	**R***
Feature Summary	* Not all systems meet the 'Representative' fidelity level. Those which do not, are marked below with an asterisk, and the level of fidelity. (e.g. *Generic) - All panel controls are touchscreen representations, unless 'Tactile' is stated	
Primary Controls:	Tactile Sidestick Representative of A320 with Spring feedback *** (Generic)** Rudder is Touchscreen input, Graphical based on A320 pedals	
	Limitations: Flight controls are only to be used for short transitions to autoflight due to lack of hardware on some flight controls Operation in Alternate or Direct Law is not allowed	
Secondary Controls	Pitch Trim: Replica of A320 pitch trim, tactile control with Force feedback Rudder Trim and Speed brakes/Spoilers: Touchscreen input, Graphic based on A320 panel	
Engine Control	Touchscreen input, Graphical based on A320 thrust levers	
Reversible controls	No	

3:	**Flight Control Systems Operation (CLO)**	**S**
Feature Summary	As per A320-214	
Flight controls type:	A320-214 FBW, sEFCS 6.0, Rehosted	
ELAC:	Thales Standard, STD L98H, S/W: 3945129110 (Simulated)	
SEC:	Thales Standard, STD 126, P/N B372CAM0104 (simulated)	
FCDC:	Litef Standard, STD 59, P/N 115370-1521, LITEF (simulated)	
FAC:	THALES, AA05, P/N C13206AA00 (simulated)	
SFCC	DIEHL AEROSPACE (software simulation), STD 11, 200301E00000308 (simulated)	
Brakes:	Airbus BSCU V5.6 Carbon Brakes	

4:	**Aircraft Systems (SYS)**		**S***
Feature Summary	* Not all systems meet the 'Specific' fidelity level. Those which do not, are marked below with an asterisk, and the level of fidelity. (e.g. *Representative) - All panel controls are touchscreen representations, unless 'Tactile' is stated		
AFM (RFM) reference:	A320 Aeroplane Flight Manual Rev.xx dd-mm-yyyy		
Primary Engine Type / Thrust:	CFM56-5B4, level/Std. 5BTF3	27,000 lbf (120 kN)	
Avionics Std/Rev:	Simulated version of EIS2 (Rehost) Standard STD1.3.2, P/N SXT4EXEESAX1320, Thales Avionics		
Autopilot:	Tactile FCU: Simulated THALES EMM, level/Std. 4, reference P/N C12850AC03		
MCDU:	Tactile MCDU: Simulated Honeywell, level/Std. V800, ref.C19266EA01		
FMS:	Tactile replica of FMGC Thales Release 1A	Release 1A	STD S7APC16; P/N C13208AA05.
Flight Warning Computer:	FWC Simulated version of STD H2-F9D P/N 350E053021818 Airbus France, (EADS Software Package)		
Cockpit Display Units: **(*Representative)**	*Flat screen representation of Display Units (EDU)		

System Data Acquisition Concentrator:	Simulated version of STD H2-E4, P/N 350E5500206, Airbus France	
Inertial Reference System:	Simulated version of BLOCK III BE04, OPS S/W Std, L4.4, P/N HG2030BE04, Honeywell	
GPS:	Simulated version of MMR GLU 925 -430, P/N 822-1821-430, Rockwell Collins	
Communications **(*Representative)**	*Touchscreen Panels: Representative of A320 ACP/RMP	no communication possible.
WX radar**: (*Generic)**	* Generic WXR	
TAWS:	Simulated version of EGPWS Honeywell MKV-A, P/N 69000942-151	
Air Data System: **(*Representative)**	*Representative of A320	
Pressurisation:	Replica of A320-214	
Landing Gear:	Simulated version of Crane Enhanced LGCIU, P/N 80-178-03- 88013	
Brakes: **(*Generic)**	*Generic brake simulation	
Hydraulics:	Replica A320-214	Simulated by TDM (ver. Xxx)
APU:	Simulated version of GTCP 131-9A, P/N 3800708-1 AMDTSS19, HONEYWELL GARRETT	
Standby instrumentation:	Thales ISIS V2	Replica of EA01, P/N C16786EA01, Simulated.
De-icing systems:	Replica A320-214	Simulated by TDM (ver. Xxx)
Transponder / TCAS:	(TCAS II 7.1) Simulated version of Honeywell T3TCAS STD 2, P/N 940-0351-001 (No ADS-B)	
Approach Capabilities:		
ILS CAT I:	Yes (no visual system)	
ILS CAT II:	Yes (no visual system)	
ILS CAT III :	Yes (no visual system)	
PBN:	RNP APCH; LNAV; LNAV/VNAV; AR (no visual system)	
RNP AR:	Yes	Limited to VNKT RNP Z RWY 02 (AR)

5: Performance And Handling On Ground (GND)	**N**

6: Performance And Handling In Ground Effect (IGE)	**G**
Model:	TDM IGE Model, Version 1.0

7: Performance And Handling Out Of Ground Effect (OGE)	**R**
OGE Model	A320 Aerodynamic Model (NFL 5.6)

8: Sound Cueing (SND)	**N**

9: Vibration Cueing (VIB)	**N**

10:	**Motion Cueing (MTN)**	**N**

11:	**Visual Cueing (VIS)**	**N**

12:	**Navigation (NAV)**	**R**
Ground Station Data Navaids:	Accurate within range of LZSH, LOWI, EIDW, EICK, EIWF, VNKT	
Update Schedule	Updated on AIRAC-28 day cycle	

13:	**Atmosphere And Weather (ATM)**	**G**
Wind Control:	Surface, intermediate, upper selectable. Backs/Veers with hemisphere.	
Pressure:	hPa / inHg selectable	
Temperature:	ºC / ºF selectable. Temperature compensation modelled for APV BaroVNAV	
Weather presets:	EASA, FAA presets available	
Predictive Windshear:	Scenarios available	

14:	**Operating Sites And Terrain (OST)**	**R**
Note:	The FSTD is not fitted with a visual system. The approach capabilities were validated to the extent of the declared aircraft system ..	
Section 3:	**Miscellaneous**	
Malfunction reference document:	A320_Malfunctions_Rev.xx	
Computer system:	Host: Quantum bit power 5200	
Snapshot:	FMS Save/Recall only	
Occupancy:	Pilot x 2, 1x Instructor, Device located in dedicated room with open seating.	
Instructor Operating Station	2 touchscreen IOS + 1 remote IOS tablet	

[The organisation operating the FSTD] declares that the information contained in this document complies with the configuration of the FSTD and that all information in this ESL is accurate and comprehensive regarding the FSTD equipment, capabilities and specifications.

Name, date and signature of the person of the organisation operating the FSTDs nominated in accordance with ORA.GEN.210(b) or his/her delegate:

Section 4: *ESL-EU-9999, dd-mmm-YYYY, Rev.x.x*			
Name and signature of the FSTD compliance manager or delegate:		Date:	

AMC1 ORA.FSTD.200 Application for FSTD qualification

RMT.0196

LETTER OF APPLICATION FOR INITIAL QUALIFICATION OF AN FSTD~~; EXCEPT BASIC INSTRUMENT TRAINING DEVICE (BITD)~~

~~A sample of letter of application is provided overleaf.~~

Part A Initial application form

~~To be submitted not less than 3 months prior to requested qualification date~~

~~(Date)~~
~~(Office – Competent Authority)~~
~~(Address) .....~~
~~(City) .....~~
~~(Country) .....~~

~~Type of FSTD~~	~~Aircraft Type/class~~	~~Qualification Level Sought~~				
~~Full Flight Simulator~~ ~~FFS~~		~~A~~	~~B~~	~~C~~	~~D~~	~~Sp./Cat~~
~~Flight Training Device~~ ~~FTD~~		~~1~~	~~2~~	~~3~~		
~~Flight and Navigation Procedures Trainer~~ ~~FNPT~~		~~I~~	~~II~~	~~III~~	~~II MCC~~	~~III MCC~~

~~Interim Qualification Level requested: YES/NO~~

General	
Type/variant /group of aircraft	
☐ Aeroplane	☐ Interim
☐ Helicopter	☐ MCC
☐ other (e.g. VTOL)	☐ UPRT *(please indicate whether it is 'approach to stall' or 'full/post stall')*

	FSTD FEATURE	FIDELITY LEVEL	Simulated aircraft
1.	Flight Deck Layout And Structure (FDK)		
2.	Flight Control Forces And Hardware (CLH)		
3.	Flight Control Systems Operation (CLO)		
4.	Aircraft Systems (SYS)		
5.	Performance And Handling On Ground (GND)		
6.	Performance And Handling In Ground Effect (IGE)		
7.	Performance And Handling Out Of Ground Effect (OGE)		
8.	Sound Cueing (SND)		
9.	Vibration Cueing (VIB)		
10	Motion Cueing (MTN)		
11	Visual Cueing (VIS)		
12	Navigation (NAV)		
13	Atmosphere And Weather (ATM)		
14	Operating Sites And Terrain (OST)		

To whom it may concern,

~~Dear,~~

<*Name of Applicant*> requests the evaluation of its flight simulation training device <*operator's identification of the FSTD*> for qualification. The FSTD has been manufactured by <*FSTD manufacturer's name*> ~~FSTD with its~~ and is equipped with a<*visual system and manufacturer's name, if applicable*> visual system and <*motion system and manufacturer's name, if applicable*> motion system.

The QTG was/will be run on <*date(s)*> at <*place*>.

~~Evaluation is requested for the following configurations and engine fits as applicable:~~
~~e.g. 767 PW/GE and 757RR~~

~~1.....~~
~~2.....~~
~~3.....~~

Evaluation is requested for the following: (list all configurations, avionics, engine fits as applicable)	
1	
2	
3	

Dates requested are: <*date(s)*> and the FSTD will be located at <*place*>.

~~The objective tests of the QTG will be submitted by <*date*> and in any event not less than 30 days before the requested evaluation date unless otherwise agreed with the competent authority.~~
Part B of the application, including the QTG, the validation data roadmap and the engineering report will be submitted within the period specified in point (g) to ACM2 ORA.FSTD.200.

~~Comments:~~
~~.....~~
~~.....~~
~~.....~~
~~.....~~

Additional information and comments

Signed
.....

~~Print name: .....~~
~~Position/appointment held: .....~~
~~Email address: .....~~
~~Telephone number: .....~~

Name of the FSTD compliance manager or delegate	
e-Mail	

Telephone	

LETTER OF APPLICATION FOR INITIAL QUALIFICATION OF AN FSTD

Part B - Declaration that the organisation operating the FSTD has performed all required objective tests and that it meets the criteria in the applicable qualification basis

(To be completed with attached QTG ~~results~~)

(Date) .....

We have completed all objective tests of the FSTD and declare that it meets all applicable requirements except as noted below.
~~The following QTG tests still have to be provided:~~

~~Tests~~	~~Comments~~

The following tests still need to be completed:	
Test ID	Comment

~~(Add boxes as required)~~

It is expected that they will be completed and submitted 3 weeks prior to the evaluation date.

For the following tests which deviate from the requirements, we provide the following rationale:	
Test ID	Comment

Signed

.....

~~Print name:~~ .....
~~Position/appointment held:~~ .....
~~E-mail address:~~ .....
~~Telephone number:~~ .....

Name of the FSTD compliance manager or delegate	
e-Mail	
Telephone	

LETTER OF APPLICATION FOR INITIAL QUALIFICATION OF AN FSTD

Part C - Declaration indicating that all objective tests, functions and subjective test have been completed as well as general requirements for the requested FCS have been met and the FSTD complies with the simulated aircraft as appropriate for each FSTD feature

~~**To be completed not less than 7 days prior to initial evaluation**~~

(Date) .....

The FSTD has been assessed by the following evaluation team:

~~(Name) ..... Qualification .....~~
~~(Name) ..... Qualification .....~~
~~(Name) ..... Qualification .....~~
~~(Name) ..... Pilot's Licence Nr .....~~
~~(Name) ..... Flight Engineer's Licence Nr (if applicable) .....~~

Name	Pilot's Licence Nr and credentials (class/ type ratings, hours on class/type, instructor qualification) FSTD technical specialist's credentials

☐ ~~FFS/FTD: This team attests that the <type of FSTD> conforms to the aeroplane flight deck/helicopter cockpit configuration of <name of aircraft operator (if applicable), type of aeroplane/helicopter> aeroplane/helicopter within the requirements for <type of FSTD and level> and that the simulated systems and subsystems function equivalently to those in that aeroplane/helicopter. The pilot of this evaluation team has also assessed the performance and the flying qualities of the FSTD and finds that it represents the designated aeroplane/helicopter.~~

☐ ~~FNPT: This team attest(s) that the <type of FSTD> represents the flight deck or cockpit environment of a <aeroplane/helicopter or class of aeroplane/type of helicopter> within the requirements for <type of FSTD and level> and that the simulated systems appear to function as in the class of aeroplane/type of helicopter. The pilot of this evaluation team has also assessed the performance and the flying qualities of the FSTD and finds that it represents the designated class of aeroplane/type of helicopter.~~

The organisations operating the FSTD declares that the FSTD complies with all the applicable requirements of CS-FSTD for the requested FCS as presented in the application Part A. This is evidenced by:

1. all the objective tests in the QTG are performed; and
2. all the functions and subjective tests in the QTG are performed.

If applicable, for the following objective, functions and subjective tests which deviate from the requirements, we provide the following rationale:	
Deviations/ discrepancies	Description

~~(Additional comments as required)~~

~~.....~~

~~.....~~

~~.....~~

Additional information as required

Signed
.....

Name of the FSTD compliance manager or delegate	
e-Mail	
Telephone	

Rationale:

The AMC proposes the template for the application of newly qualified FSTD. It has been updated to comply with the FCS framework and the new CS-FSTD.

AMC2 ORA.FSTD.200 Application for FSTD qualification

RMT.0196

GENERAL

(a) Once an FSTD is contracted to be built, the organisation that is to operate the FSTD should ensure that the regulatory standard upon which the FSTD will eventually be qualified against is acceptable to the competent authority. This should be the current applicable version of CS-FSTD at the time of application.

(b) The application form should be printed in English and any other language(s) of the competent authority's choosing.

(c) The initial application form (Part A of the application), together with the documents as referred in point ORA.FSTD.200(a) should be submitted to the competent authority ideally six months, but not later than three months before the requested evaluation date.

(d) Well in advance of the requested evaluation date, the organisation operating the FSTD should submit to the competent authority the validation material which should be used for the qualification test guide. This will ensure that the content of the QTG is acceptable to the competent authority and avoid time being wasted during the initial qualification. The acceptability of all tests depends upon their content, accuracy, completeness and recency of the results.

(e) Organisations operating the FSTD who seek a qualification based on preliminary data should consult their competent authority as soon as it is known that special arrangements will be

necessary, or as soon as it is clear that preliminary data will need to be used for FSTD qualification.

(f) In case the FSTD has additional equipment for which qualification is not sought, the organisation operating the FSTD may specify such equipment in the equipment specification list (ESL) indicating that it is not part of the requested qualification. When doing so, the organisation operating the FSTD should inform the competent authority of such equipment with the application form and provide the results of the assessment performed in accordance with point ORA.FSTD.120(d).

(g) Part B of the application form, together the documents referred in point ORA.FSTD.200(b) should be submitted by a date agreed with the competent authority, but not less than 30 days before the requested evaluation date. Deficiencies should be addressed prior to the start of the on-site evaluation. Should this not be possible, the organisation should provide a rectification plan, including a timeline, to be agreed with the competent authority.

(h) The declaration as referred in to point ORA.FSTD.200(c) (Part C of the application form) should be completed and submitted to the competent authority not less than seven days prior to initial evaluation.

(i) Prior to completion of the initial evaluation process, the organisation operating the FSTD should ensure that:

1) each objective test in the QTG is marked as verified, dated and signed; and
2) functions and subjective tests in the QTG are marked as completed, dated and signed; and
3) the statements of justification are marked as verified, dated and signed.

Rationale:
Point (a) is an existing text from point (b)(1) to AMC1 ARA.FSTD.100(a)(1) which is moved here as it establishes requirements to the organisation and is linked with the application form.
The text in point (b) is based on the existing requirements in AMC1 ARA.FSTD.100(a)(1), point (b)(2).
Deadlines established in points (c) and (g) are based on the ARA.FSTD.100(a)(1), point (b)(2).
Point (d) is based on AMC3 ARA.FSTD.100(a)(1), point (a). It is moved as it establishes a requirement to the organisation operating the FSTD. A slight change from the existing wording is proposed. Instead of agreement between the authority and the aircraft manufacturer on the content and acceptability of the validation tests in the QTG, the agreement should be between the organisation operating the FSTD and the competent authority. The organisation is responsible for applying for the qualification of the FSTD and therefore it takes responsibility on the acceptability of the validation tests in the QTG. The data may come from another data provider than the aircraft manufacturer and therefore this part of the sentence is replaced with a proposal that the organisation operating the FSTD submits to the authority the validation material which will be used for the QTG.
Point (e) is based on point (c) of AMC1 ARA.FSTD.115 according to which it is possible that a preliminary validation data in the application process and the organisation operating the FSTD should consult the competent authority about this arrangement.

Point (f) allows that the organisation operating the FSTD describes additional equipment for which qualification is not sought in the ESL and informs the authority of such equipment with Part-A of the application and provides the results of the assessment performed in accordance with point ORA.FSTD.120(d).
The deadlines specified in points (g) and (h) follow the existing practice and are not changed.
Point (i) is developed due to an existing gap in the requirements that the organisation should provide to the competent authority QTG where the objective, functions and subjective tests are verified, as applicable, dated and signed. This requirement is similar to the obligation of the organisation operating the FSTD to conduct the objective, functions and subject tests are part of the FSTD maintenance (point ORA.FSTD.105). It was found out that such requirement for the initial qualification of the FSTD was missing and therefore it is clarified in point (i).

GM1 ORA.FSTD.200 Application for FSTD qualification

RMT.0196

SUBMISSION OF QTG

The organisation operating the FSTD may decide to accomplish the objective tests while the FSTD is at the manufacturer's facility. Tests at the manufacturer's facility should be accomplished at the latest practical time prior to disassembly and shipment. The organisation operating the FSTD should then validate FSTD performance at the final location by repeating at least one third of the objective tests in the QTG and submitting those tests to the competent authority. The QTG should be clearly annotated to indicate when and where each test was accomplished.

Rationale:

This new GM includes text from CS-FSTD(A) regarding the possibility to run objective tests in factory and then validate the FSTD performance by repeating at least one third of the objective tests on site.

~~GM1 ORA.FSTD.200 Application for FSTD qualification~~

~~USE OF FOOTPRINT TESTS IN QUALIFICATION TEST SUBMISSION~~

~~(a) Introduction~~

~~(1) Recent experience during initial qualification of some FFSs has required acceptance of increasing numbers of footprint tests. This is particularly true for FFSs of smaller or older aircraft types, where there may be a lack of aircraft flight test data. However, the large number of footprint tests offered in some QTGs has given rise to concern.~~

~~(2) This guidance is applicable to FFS aeroplane, FTD aeroplane, FFS helicopter and FTD helicopter qualifications.~~

~~(b) Terminology~~

(1) Footprint test - footprint test data are derived from a subjective assessment carried out on the actual FSTD requiring qualification. The assessment and validation of these data are carried out by a pilot appointed by the competent authority. The resulting data are the footprint validation data for the FSTD concerned.

(c) Recommendation

(1) It is permitted to use footprint data where flight test data is not available. Only when all other alternative possible sources of data have been thoroughly reviewed without success may a footprint test be acceptable, subject to a case-by-case review with the competent authorities concerned, and taking into consideration the level of qualification sought for the FSTD.

(2) Footprint test data should be:

(i) constructed with initial conditions and FFS set up in the appropriate configuration (e.g. correct engine rating) for the required validation data;

(ii) a manoeuvre representative of the particular aircraft being simulated;

(iii) manually flown out by a type rated pilot who has current experience on type* and is deemed acceptable by the competent authority**;

(iv) constructed from validation data obtained from the footprint test manoeuvre and transformed into an automatic test;

(v) an automatic test run as a fully integrated test with pilot control inputs; and

(vi) automatically run for the initial qualification and recurrent evaluations.

* In this context, 'current' refers to the pilot experience on the aircraft and not to the Part-FCL standards.

** The same pilot should sign off the complete test as being fully representative.

(3) A clear rationale should be included in the QTG for each footprint test. These rationales should be added to and clearly recorded within the validation data roadmap (VDR) in accordance with and as defined in Appendix 2 to AMC1-CS-FSTD(A).300.

(4) Where the number of footprint tests is deemed by the competent authority to be excessive, the maximum level of qualification may be affected. The competent authority should review each area of validation test data where the use of footprint tests as the basis for the validation data is proposed. Consideration should be given to the extent to which footprint tests are used in any given area.

For example, it would be unacceptable if all or the vast majority of takeoff tests were proposed as footprint tests, with little or no flight test data being presented. It should be recognised, therefore, that it may be necessary for new flight test data to be gathered if the use of footprint tests becomes excessive, not just overall, but also in specific areas.

(5) For recurrent evaluation purposes an essential match is to be expected. Validation tests using footprint data which do not provide an essential match should be justified to the satisfaction of the competent authority.

~~The competent authority should be consulted at the point of definition of the aircraft data for qualification prior to the procurement of the device if footprint tests need to be used.~~

Rationale:

This GM is proposed to be deleted with the rationale this information is covered by the new CS-FSTD, Subpart C.

AMC1 ORA.FSTD.210(b) Qualification basis

PMT.0196

QUALIFICATION OF NEW TECHNOLOGY OR SYSTEMS

Where a modification of an FSTD involves a change of technology or an addition of a new system or equipment that is not covered by the qualification basis used for the initial qualification, and an evaluation of such changes is not possible using the original qualification basis, the particular changes may be verified by using newer certification specifications that apply to these changes.

Rationale

The new AMC clarifies which qualification basis an organisation operating the FSTD should follow in case of a major change of technology or a new system or equipment that is not covered by the qualification basis.

The AMC is based on the GM1 ARA.FSTD.130. The text from this former GM is deleted and moved to this AMC in order to establish an acceptable means of compliance when a different qualification basis is used for a modification of an FSTD. It would allow use of a different from the original qualification basis for a modification to an FSTD which involves a change of technology or an addition of a new system or equipment that is not covered by the qualification basis used and that newer qualification basis will apply to that modification.

AMC2 ORA.FSTD.225(b) Duration and continued validity

PMT.0196

EXTENDED EVALUATION PERIOD- ORGANISATION'S DOCUMENTATION

(a) For the purpose of extending the recurrent evaluation period of an FSTD, the organisation that operates the FSTD should provide the following to the competent authority:

[....]

(4) the FSTD performance evaluation metrics developed in accordance with ~~AMC2 ORA.FSTD.100~~ point ORA.FSTD.100(d) for the previous 2 years;

[....]

(d) The organisation operating the FSTD should address identified items in accordance with point ORA.FSTD.100(c).

Rationale

The AMC is new proposed with RMT.0587 (pending publication with EASA ED Decision), following the publication of the latest amendments to the Aircrew Regulation (Commission Implementing Regulation (EU) 2024/2076). A change in the AMC point (a)(4) is necessary to update the reference to point ORA.FSTD.100(d) which are introduced with the RMT.0196.

Point (d) is added following the proposed change in the hard law (point ORA.FSTD.100(c)), making it possible to request the organisation operating the FSTD to treat any non-compliances (items) identified during the EEP tasks. The treatment of the items should follow the standard process of defining a corrective action plan and its implementing to the satisfaction of the competent authority. This process is proposed to be formalised in a new point (c) to ORA.FSTD.100.

GM1 ORA.FSTD.225(b) Duration and continued validity

PMT.0196

INDEPENDENCE OF THE ASSIGNED PERSON(S)

An effective compliance monitoring function is necessary to support the implementation of the extended evaluation period. It is essential that an appropriate level of independence be maintained, and the tasks referred to in point ORA.FSTD.225(b) should not be undertaken by a person that, within the previous 12-month recurrent period, was involved in the tasks referred to in point ORA.FSTD.105~~(b)~~ (a)(2) and (3) and for the relevant FSTD being evaluated.

Rationale

The GM is new proposed with RMT.0587 (pending publication with EASA ED Decision), following the publication of the latest amendments to the Aircrew Regulation (Commission Implementing Regulation (EU) 2024/2076). A change in the GM is necessary to make the right reference to the hard law which is introduced with the RMT.0196.

GM1 ORA.FSTD.225(b)(3) Duration and continued validity

PMT.0196

TEMPLATE OF AN EVALUATION REPORT FOR FSTD UNDER EXTENDED EVALUATION PERIOD

Logo and Name of FSTD Operator

Flight Simulation Training Device (FSTD)

Evaluation Report - EEP

FSTD Operator

FSTD Identification

Aeroplane/Helicopter type and variant or group of aircraft (only for legacy FSTD)

Engine fit simulated

Date of the report

Report Issue number

Table of Contents

1. Flight Simulator Training Device

FSTD Location	
FSTD Manufacturer and FSTD Identification serial number	
Visual system	
Motion system	
Engine Instrumentation	
Flight instrumentation	
Validation Data Roadmap ID No	
Technical criteria primary reference document	

2. FSTD qualification

FSTD qualification level (only in case of legacy)	
Additional Qualifications	
MCC	yes/no
UPRT	No/Full Stall/Approach to stall

	FSTD FEATURE	FIDELITY LEVEL	Simulated aircraft
1.	Flight Deck Layout And Structure (FDK)		
2.	Flight Control Forces And Hardware (CLH)		
3.	Flight Control Systems Operation (CLO)		
4.	Aircraft Systems (SYS)		
5.	Performance And Handling On Ground (GND)		
6.	Performance And Handling In Ground Effect (IGE)		
7.	Performance And Handling Out Of Ground Effect (OGE)		
8.	Sound Cueing (SND)		
9.	Vibration Cueing (VIB)		
10	Motion Cueing (MTN)		
11	Visual Cueing (VIS)		
12	Navigation (NAV)		
13	Atmosphere And Weather (ATM)		
14	Operating Sites And Terrain (OST)		

3. Evaluation details

Date	

ESL revision	
Software Load Revision Number	
Assigned person(s) for EEP	
Technical FSTD expert	
Flight crew training expert	
Supporting Pilot	

4. Supplementary information

Visual databases used	
Malfunctions used	
Abnormal and emergency procedures	
Description of continuous flight	
Other	

5. Results

During the FSTD evaluation, various identified issues may necessitate operator resolution. It is crucial to differentiate between two distinct categories when managing these items: severity A and severity B.

Item severity A

Items falling into this category are identified by the evaluation team as one of the following:

(a) a simulation feature, system, subsystem, component or part that fails to comply with the qualification basis, which may affect the FCS, ESL or the FSTD qualification and training, testing and checking and/or potentially lead to a negative transfer of training;
(b) Non-compliance with the qualification basis, such as objective test results being out of tolerance.

Item severity B

Items categorised as severity B by the evaluation team are simulation features, systems, subsystems, components, or parts that are temporarily inoperative or operating below their nominal level. However, the overall serviceability of the FSTD is demonstrated by the organisation.

Observation

Issues where compliance with the required standard is not clearly proven and therefore require a subsequent assessment by the FSTD organisation. Following the outcome of each assessment, an 'Observation' may be promoted to 'Item'.

6. Assigned person(s) for EEP

Name	Position	Organisation	Signature/e-signature
	Technical FSTD expert		
	Flight crew training expert		
	Supporting pilot		

Rationale

The new GM1 ORA.FSTD.225(b)(3) provides a template for an evaluation report which may be used by the organisation operating the FSTD. The template proposes classification of the items, similarly to the classification of items by the competent authority.

The text was consulted with the FSTD focal points from national competent authorities of the Member States on 10 June 2024. No changes were proposed as a result of this consultation.

~~AMC1 ORA.FSTD.230(b) Changes to the qualified FSTD~~

~~*ED Decision 2012/007/R*~~

~~UPDATING AND UPGRADING EXISTING FSTDs~~

~~(a) An update is a result of a change to the existing device where it retains its existing qualification level. The change may be certified through a recurrent inspection or an extra inspection if deemed necessary by the competent authority according to the applicable requirements in effect at the time of initial qualification.~~

~~(b) If such a change to an existing device would imply that the performance of the device could no longer meet the requirements at the time of initial qualification, but that the result of the change would, in the opinion of the competent authority, clearly mean an improvement to the~~

~~performance and training capabilities of the device altogether, then the competent authority might accept the proposed change as an update while allowing the device to retain its original qualification level.~~

~~(c) An upgrade is defined as the raising of the qualification level of a device, or an increase in training credits, which can only be achieved by undergoing an initial qualification according to the latest applicable requirements.~~

~~(d) As long as the qualification level of the device does not change, all changes made to the device should be considered to be updates pending approval by the competent authority.~~

~~(e) An upgrade, and consequent initial qualification according to the latest applicable requirements, is only applicable when the organisation requests another qualification level (recategorisation) for the FSTD.~~

Rationale:

This AMC is outdated with the FCS framework, and therefore proposed to be deleted. The process for modification of FSTD is outlines in point ORA.FSTD.110 and the associated AMC/GM.

Draft amendments – Regulation (EU) No 965/2012 and associated AMC & GM

AMC1 ORO.FC.145(d) Provision of training, checking and assessment

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FSTD USED TO MEET THE REQUIREMENTS OF THIS REGULATION - AEROPLANES

(a) When the provisions of this Regulation require a suitable FSTD for the completion of a certain item of a training and checking programme or syllabus, the FSTD used should have a fidelity level (FCS) which is equal to or higher than the equivalent determined in point FCL.036(a)(1) in Regulation (EU) 1178/2011 for the same training item.

(b) Notwithstanding AMC1 ORO.FC.140(a), when Part-FCL does not offer an FCS for a particular item, the operator should use an FFS level C or D, or an FSTD with a FCS which is at least equal to an FFS level C or D, as determined in point FCL.036(a).

FULL FLIGHT SIMULATORS (FFS)

~~(b)~~(c) The operator should classify any differences between the aircraft and FFS in accordance with the Air Transport Association (ATA) chapters as follows:

Compliance Levels

~~(a)~~(1) Level A differences:

~~(1)~~(i) no influence on flight characteristics;

~~(2)~~(ii) no influence on procedures (normal and/or abnormal);

~~(3)~~(iii) differences in presentation; and

~~(4)~~(iv) differences in operation. Method: self-instruction via the operations manual or flight crew information.

~~(b)~~(2) Level B differences:

~~(1)~~(i) no influence on flight characteristics;

~~(2)~~(ii) influence on procedures (normal and/or abnormal); and

~~(3)~~(iii) possible differences in presentation and operation.

Method: flight crew information, computer-based training, system device training or special instruction by instructor.

~~(c)~~(3) Level C differences:

~~(1)~~(i) influence on flight characteristics;

~~(2)~~(ii) influence on procedures (normal and/or abnormal); and

~~(3)~~(iii) eventually differences in presentation and operation.

Method: special instruction by instructor, a selected partial training on another FSTD or aircraft or a waiver because of previous experience, special instruction or training programme.

~~(d)~~(4) Level D differences:

~~(1)~~(i) influence on flight characteristics; and/or

~~(2)~~(ii) influence on procedures (normal and/or abnormal); and/or

~~(3)~~(iii) differences in presentation and/or operation; and

~~(4)~~(iv) FSTD is level D qualified and is used for zero flight-time training (ZFTT).

Method: a specified partial training on another FSTD or aircraft or a waiver because of previous experience, special instruction or training programme.

Rationale

The intention of the new proposed point (a) is to support the use of the minimum fidelity level provided in Part-FCL. In Regulation (EU) 1178/2011 (the Aircrew Regulation), a list of items

(manoeuvres/exercises) with their corresponding minimum fidelity level is provided. In the Air OPS Regulation, however, the exercise of identifying the minimum fidelity level for all the items has not taken place. Thus, EASA proposes a cross-reference to the Aircrew Regulation, making use of the work already performed in the Aircrew Regulation. For those manoeuvres not covered in the Aircrew Regulation, the proposed point (b) provides an acceptable means of compliance.

The wording 'item' is used (instead of other possibilities such as 'exercise' or 'manoeuvre') because it is already used in AMC1 ORO.FC.145(a) TRAINING AND CHECKING PROGRAMMES AND SYLLABI, which is a fundamental part of the whole structure of ORO.FC. Point (a) of the AMC reads: '(a) Training and checking programmes and syllabi should include as a minimum: (…)(2) a list of the items covered;'. Additionally, in Appendix 9, Part FCL Regulation (EU) 1178/2011, 'item' is used instead of 'manoeuvre' or any other form to express the same concept.

The intention of using 'item' (alone) and not 'training item' or 'checking item' ', assessment item', and any other form that would specify more the scope of the wording is that EASA intends to cover all training, checking and assessment items. Furthermore, after an analysis of the regulation, the wording 'training item' is not used in subpart ORO.FC and it is only used in the Air OPS regulation 19 times, mainly in the GPWS and ACAS requirements. 'Checking item' or 'assessment item' is not used in the Air OPS Regulation.

Although it was evaluated, the use of the word 'exercise' was discarded. The wording 'exercise' is frequently used in the Regulation to describe the 'exercise' that will be conducted in the actual FSTD, or aircraft, usually with an instructor or examiner observing, and it is referring to the actual manoeuvre(s), while 'item' is used in the context of regulatory compliance, which is a more appropriate context for this provision.

The intent of the new proposed point (b) is to fill the gap for items not addressed in Part-FCL. This provision is introduced to ensure that a minimum fidelity is always used to conduct training and checking with aeroplanes. That means using either an FFS C or D or an FSTD with an FCS signature equivalent to FFS C or D. . In other words, there are two options when the qualification is not defined in Part FCL:

- To use FFS C or D or
- To use an FCS signature equivalent to FFS C or D.

The proposed exclusion of AMC1 ORO.FC.140(a) means that in the case of this AMC different (lower) specific FSTD levels may be used. See example below:
'AMC1 ORO.FC.140(a) Operation on more than one type or variant
(…)
Footnote (1): — Aeroplane: FTD level 2, or FFS, or aeroplane.'

AMC1 ORO.FC.145(a) Provision of training, checking and assessment

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TRAINING AND CHECKING PROGRAMMES AND SYLLABI

[…]

(b) Further details on the training and checking programmes and syllabi should be included in the operations manual depending on the complexity of the operations (e.g., further contextualisation of the training programme, details of the airport in which some items will be covered, time allocation to brief and debrief, whether the item to be trained is a legal requirement or an operator (e.g., SMS) item, etc.).

Rationale

This is an editorial amendment to clarify the intent of this provision. EASA has received feedback that some operators understood that additional items in the training programme could only be introduced if there was an SMS input. This clarification should allow the operator to introduce other items in the training programme, such as items related to best practices in the industry or items related to a qualification standard, for example, in the context of IOSA, etc.