

Annex IV to ED Decision 2019/005/R
‘AMC and GM to Part-ORO — Issue 2, Amendment 13’

The Annex to ED Decision 2014/017/R of 24 April 2014 is hereby amended as follows:

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

- (a) deleted text is ~~struck through~~;
- (b) new or amended text is highlighted in **blue**;
- (c) an ellipsis ‘[...]’ indicates that the remaining text is unchanged.

- (1) The new AMC1 ORO.FC.120&130 is inserted as follows:

AMC1 ORO.FC.120&130 Operator conversion training and checking & recurrent training and checking

FLIGHT PATH MANAGEMENT (MANUAL OR AUTOMATIC, AS APPROPRIATE) DURING UNRELIABLE AIRSPEED INDICATION AND OTHER FAILURES AT HIGH ALTITUDE IN AEROPLANES WITH A MAXIMUM CRUISING ALTITUDE ABOVE FL300

For the operation of aeroplanes with a maximum cruising altitude above FL300, training elements from the following table should be integrated into:

- (a) operator conversion training; and
- (b) recurrent training at least every 12 calendar months, such that all elements are covered over a period not exceeding 3 years:

Element	Theoretical Knowledge	Practical training
Basic flight physics principles concerning flight at high altitude, with a particular emphasis on the relative proximity of the critical Mach number and the stall, pitch behaviour, and an understanding of the reduced stall angle of attack when compared with low-altitude flight.	•	•
Interaction of the automation (autopilot, flight director, auto-throttle/auto-thrust) and the consequences of failures inducing disconnection of the automation.	•	•
Consequences of an unreliable airspeed indication and other failures at high altitude and the need for the flight crew to promptly identify the failure and react with appropriate (minimal) control inputs to keep the aircraft in a safe envelope.	•	•

Degradation of fly-by-wire (FBW) flight control laws/modes and its consequence on aircraft stability and flight envelope protections, including stall warnings.	•	•
Practical training, using appropriate simulators, on manual handling at high altitude in normal and non-normal flight control laws/modes, with particular emphasis on pre-stall buffet, the reduced stall angle of attack when compared with low-altitude flight and the effect of pitch inputs on the aircraft trajectory and energy state.		•
The requirement to promptly and accurately apply the stall recovery procedure, as provided by the aircraft manufacturer, at the first indication of an impending stall. Differences between high-altitude and low-altitude stalls must be addressed.	•	•
Procedures for taking over and transferring manual control of the aircraft, especially for FBW aeroplanes with independent side-sticks.	•	•
Task sharing and crew coordination in high workload/stress conditions with appropriate call-out and acknowledgement to confirm changes to the aircraft flight control law/mode.	•	•

(2) Table 1 in paragraph (a) of AMC1 ORO.FC.220&230 is amended as follows:

(a) Components 1, 2 and 3 of element B (Causes and contributing factors of upsets) are amended as follows:

'1.	Environmental	•	•
2.	Pilot-induced	•	•
3.	Mechanical (aeroplane system)	•	•

(b) Component 1 of element C (Safety review of accidents and incidents relating to aeroplane upsets) is amended as follows:

'1.	Safety review of accidents and incidents relating to aeroplane upsets	•	•
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(c) Component 4 of element I is amended as follows:

'4.	Go-arounds from various stages during the approach (refer to point (d) of GM1 to Appendix 9 to Part-FCL ¹ for further guidance on go-around training)	•	•
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¹ Please refer to [ED Decision 2011/016/R](#).

(3) GM1 ORO.FC.220&230 is amended as follows:

(a) the two paragraphs following the headline 'USE OF FSTD FOR UPRT' and before the headline 'ADDITIONAL GUIDANCE' are amended as follows:

'The use of an FSTD provides valuable training without the risks associated with aeroplane training. The training envelope (envelope within which all training exercises will be carried out) should be specified by the operator in terms of the range of attitudes, speed and g-loads that can be used for training, taking into account:

(1) the training environment;

(2) the capabilities of the instructors; and

(3) in the case of training in FSTDs, the limitations of the FSTD (as per GM15 to Annex I (Definitions) to Commission Regulation (EU) No 965/2012 for the FSTD training envelope); and

(4) in the case of training in aeroplanes, the capabilities and certification of the aeroplane, while considering a margin of safety in order to ensure that unintentional deviations from the training envelope will not exceed aeroplane limitations. Different training envelopes may be specified for different aeroplane types even within a single training course. In order to avoid 'negative transfer of training', the capabilities of the specific FSTD to be used should be considered when designing and delivering the training programme, especially when manoeuvre training could involve operation outside the normal flight envelope of the aeroplane, for example during aerodynamic stall. Type specific content contained in the training programme should be developed in consultation with the Original Equipment Manufacturers (OEMs).

Some FSTDs may offer capabilities that could enhance the UPRT, such as Instructor Operating Station (IOS) features. Operators may consider the value of such features in support of their training objectives.'

(b) the second paragraph after the headline 'ADDITIONAL GUIDANCE' is amended as follows:

'Further guidance is available from in:

- Revision 2 (as regards training scenarios for UPRT) and Revision 3 of the Aeroplane Upset Recovery Training Aid (AURTA (Revision 2) / AUPRTA (Revision 3)), the UK CAA Paper 2013/02 ('Monitoring Matters'); and
- the Flight Safety Foundation Publication ('A Practical Guide for Improving Flight Path Monitoring'), November 2014.'

(4) In GM2 ORO.FC.220&230, the text following the headline 'GO-AROUNDS FROM VARIOUS STAGES DURING THE APPROACH' is replaced by the following:

'Guidance on go-around training is provided in point (d) of GM1 to Appendix 9 to Part-FCL.'

(5) GM3 ORO.FC.220&230 is amended as follows:

- (a) The first paragraph following the headline 'STALL EVENT RECOVERY TRAINING' is amended as follows:

'It is of utmost importance that stall event recovery training takes into account the capabilities of the FFS used. ~~Most current and grandfathered FFS models are deficient in representing the aeroplane in the aerodynamic stall regime, thus practising of 'full stall' in such a device could potentially result in negative training or negative transfer of training. The term 'stall event' is therefore introduced to cater for the capability of current and grandfathered FFS, and for potential future FFS enhancements.~~ To deliver stall event recovery training, the FFS should be qualified against the relevant UPRT elements of CS-FSTD Issue 2. 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 Issue 2 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 an aerodynamic stall.

The second paragraph starting with the word 'IMPORTANT', is deleted.

- (b) The last paragraph of the text between the headline 'STALL EVENT RECOVERY TRAINING' and Table 1 (Recommended Stall Event Recovery Template) is amended as follows:

'Refer to ~~Revision 32~~ of the Airplane Upset Prevention and Recovery Training Aid (AUPRTA) for a detailed explanation and rationale on the stall event recovery template as recommended by the OEMs.';

- (c) The last paragraph of the text between the headline 'NOSE HIGH AND NOSE LOW RECOVERY TRAINING' and Table 2 (Recommended Nose High Recovery Strategy Template) is amended as follows:

'Refer to ~~Revision 32~~ of the Airplane Upset Prevention and Recovery Training Aid (AUPRTA) for a detailed explanation and rationale on the nose high and nose low recovery strategies as recommended by the OEMs.';

- (6) GM4 ORO.FC.220&230 is deleted.

- (7) In GM5 ORO.FC.220&230, point (4) is amended as follows:

- (4) 'understand the capabilities and limitations of the FSTD used for UPRT, based on the applicable FSTD training envelope;'