'AMC and GM to Part-ORO — Issue 2, Amendment 17'

The Annex to ED Decision 2014/017/R is 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.

GM1 ORO.GEN.130(b) Changes related to an AOC holder

CHANGES REQUIRING PRIOR APPROVAL

The following list ~~GM~~ is a non-exhaustive checklist of items that require prior approval from the competent authority as specified in the applicable Implementing Rules:

(a) alternative means of compliance;

(b) procedures regarding items to be notified to the competent authority; (…)

AMC1 ORO.FC.115 Crew resource management (CRM) training

CRM TRAINING — MULTI-PILOT OPERATIONS

(a) General

(1) Training environment

CRM training should be conducted in the non-operational environment (classroom and computer-based) and in the operational environment (flight simulation training device (FSTD) including other training solutions described in CS-FSTD when available and aircraft). Tools such as group discussions, team task analysis, team task simulation and feedback should be used.

(2) Classroom training

Whenever possible, classroom training should be conducted in a group session away from the pressures of the usual working environment, so that the opportunity is provided for flight crew members to interact and communicate in an environment conducive to learning.

(3) Computer-based training (CBT)

Computer-based training should not be conducted as a stand-alone training method~~,~~ but may be conducted as a complementary training method.

Complementary training method in the context of EBT: advanced CBT following the aviation blended learning environment, such as virtual reality, chatbots, interactive scenario trainers, etc. may serve as the principal method to deliver training in the non-operational environment. In such case, the classroom training may be the complementary method.

(…)

AMC1 ORO.FC.146(c) Personnel providing training, checking and assessment

EBT INSTRUCTOR — INITIAL STANDARDISATION PROGRAMME

(a) Before delivering the operator's EBT programme, the instructor should complete an EBT

instructor initial standardisation programme composed of:

(1) EBT instructor training; and

(2) EBT assessment of competence.

EBT INSTRUCTOR TRAINING

(b) The EBT instructor training course should be delivered by at least one pilot who is or has been an EBT instructor, and who has demonstrated proficiency to train the elements specified in point (c) below.

(c) The EBT instructor training course should comprise theoretical and practical training. At the completion of EBT instructor training, the instructor should:

(1) have knowledge of EBT, including the following underlying principles:

(i) competency-based training;

(ii) learning from positive performance;

(iii) building resilience; and

(iv) data-driven training;

(2) demonstrate knowledge of the structure of an EBT module;

(3) demonstrate knowledge of the method of training delivery for each phase of an EBT module;

(4) demonstrate knowledge of the principles of adult learning and how they relate to EBT;

(5) conduct objective observations based on a competency framework, and document evidence of observed performance;

(6) relate specific performance observations of competencies;

(7) analyse trainee performance to determine competency-based training needs and recognise strengths;

(8) evaluate performance using a competency-based grading system;

(9) apply appropriate teaching styles during simulator training to accommodate trainee learning needs;

(10) facilitate trainee learning, focusing on specific competency-based training needs; and

(11) conduct a debrief using facilitation techniques.

(d) An instructor may be given credits for parts of point (c) if the instructor has demonstrated competencies in those topics.

EBT ASSESSMENT OF COMPETENCE

(e) Prior to conducting assessment and training within an EBT programme, the EBT instructor should complete an EBT assessment of competence where the EBT instructor delivers:

(1) an evaluation phase (EVAL) and a manoeuvres training phase (MT); or

(2) a scenario-based training phase (SBT).

(f) The assessment of competence has a validity period of 3 years counted from the end of the month the assessment of competence was conducted.

(g) The EBT assessment of competence should be conducted by a person nominated by the operator, who:

(1) is qualified in accordance with Annex I (Part-FCL) to Regulation (EU) No 1178/2011 to conduct an assessment of competence; and

(2) has completed the EBT instructor standardisation.

(h) The EBT assessment of competence may be combined with the assessment of competence required in Annex I (Part-FCL) to Regulation (EU) No 1178/2011.

AMC2 ORO.FC.146(c) Personnel providing training, checking and assessment

EBT INSTRUCTOR — RECURRENT STANDARDISATION PROGRAMME

The EBT instructor should:

(a) conduct six EVAL or SBT phases of an EBT module (or a combination of both) every 36 months. One of the EVAL or SBT should take place in the period of 12 months immediately preceding the expiry date. The 36-month period should be counted from the end of the month the module was taken. If this has not been fulfilled, the EBT instructor should complete an EBT assessment of competence. When the module is undertaken within the last 12 months of the validity period, the new period should be counted from the original expiry date;

(b) receive annual recurrent standardisation. The recurrent standardisation should include:

(1) refresher EBT training; and

(2) concordance training; and

(c) complete an assessment of competence every 3 years. When the assessment of competence is conducted within the 12 months preceding the expiry date, the next assessment of competence should be completed within 36 calendar months of the original expiry date of the previous assessment of competence.

GM1 ORO.FC.146(c) Personnel providing training, checking and assessment

EBT INSTRUCTOR — INITIAL STANDARDISATION

(a) The intent of the practical training is to ensure that EBT instructors have exposure to assessment of performance and root cause identification within an EBT programme.

(b) EBT instructors receive practical assistance and guidance during standardisation in order to apply the learning from EBT instructor training. In particular, the focus should be on assessment of performance and the determination of root cause for remediation, plus facilitated debriefing based on root cause as a learning objective.

(c) The pilot delivering the training may be supported by a subject matter expert (or experts). The personnel providing the EBT training is selected by the operator to assess the instructor capability in delivering EBT and provide effective feedback in order that instructor practice meets the expectations of the operator.

(d) Practical EBT training includes the learning objective 'Evaluate performance using a competency-based grading system'. This may be done with videos and other multimedia. It means that EBT instructors are exposed to:

(1) different levels of pilot performance. This enables EBT instructors to distinguish between pilots performing lower than the minimum acceptable level of performance (e.g. grade 1) and those whose performance is at an acceptable level in all competencies (e.g. grade 2). This EBT training may also include other performance examples (e.g. 3, 4 and 5); and

(2) different scenarios (e.g. complex to less complex) so that the instructor has exposure to assessments of competency in varying EBT scenarios.

(e) The EBT instructor training course may be a minimum of 14 hours (EBT instructor training alone) and the recommended length is between 21 to 24 hours (EBT instructor training plus assessment of competence).

GM2 ORO.FC.146(c) Personnel providing training, checking and assessment

EBT INSTRUCTOR — RECURRENT STANDARDISATION

(a) Refresher EBT training

The intent of this training is to provide the framework for existing instructors to develop their competence to conduct EBT. Further guidance can be found in the EASA EBT manual.

(b) Concordance training

This training is one of the elements to ensure concordance within the EBT instructor community. Those EBT instructors who do not demonstrate concordance may require further training. The operator's instructor standardisation and concordance assurance programme provides insight in the areas that an instructor (or instructor population) requires concordance training. As such, concordance training varies in content and scale depending on the need for concordance improvement.

Instructor concordance training may include candidates grading the same controlled content (e.g. a video or paper case) followed by:

(1) a subsequent comparison of intra-group variance; and

(2) alignment of root-cause analyses between instructors.

GM3 ORO.FC.146(c) Personnel providing training, checking and assessment

EBT INSTRUCTOR COMPETENCY FRAMEWORK

Pilot competencies[1]	
Description:	See pilot competency framework
Instructor observable behaviour (iOB)	See pilot competency framework

[1] For ground instructors, some competencies may not apply. For the instructor assessment of competence, these competencies may not be observed. A review of the records of the instructor may be sufficient.

Management of the learning environment	
Description:	Ensures that the instruction, assessment and evaluation are conducted in a suitable and safe environment
iOB 2.1	Applies TEM in the context of instruction/evaluation
iOB 2.2	Briefs on safety procedures for situations that are likely to develop during instruction/evaluation
iOB 2.3	Intervenes appropriately, at the correct time and level (e.g. progresses from verbal assistance to taking over control)
iOB 2.4	Resumes instruction/evaluation as practicable after any intervention
iOB 2.5	Plans and prepares training media, equipment and resources
iOB 2.6	Briefs on training devices or aircraft limitations that may influence training, when applicable
iOB 2.7	Creates and manages conditions (e.g. airspace, ATC, weather, time, etc.) to be suitable for the training objectives
iOB 2.8	Adapts to changes in the environment whilst minimising training disruptions
iOB 2.9	Manages time, training media and equipment to ensure that training objectives are met

Instruction	
Description:	Conducts training to develop the trainee's competencies

iOB 3.1	References approved sources (operations, technical and training manuals, standards and regulations)
iOB 3.2	States clearly the objectives and clarifies roles for the training
iOB 3.3	Follows the approved training programme
iOB 3.4	Applies instructional methods as appropriate (e.g. explanation, demonstration, learning by discovery, facilitation, in-seat instruction)
iOB 3.5	Sustains operational relevance and realism
iOB 3.6	Adapts the amount of instructor inputs to ensure that the training objectives are met
iOB 3.7	Adapts to situations that might disrupt a planned sequence of events
iOB 3.8	Continuously assesses the trainee's competencies (e.g. by including the root cause(s) of the deficiency(-ies) observed according to the competency framework)
iOB 3.9	Encourages the trainee to self-assess
iOB 3.10	Allows the trainee to self-correct in a timely manner
iOB 3.11	Applies trainee-centred feedback techniques (e.g. facilitation, etc.)
iOB 3.12	Provides positive reinforcement

Interaction with the trainees	
Description:	Supports the trainees' learning and development and demonstrates exemplary behaviour (role model)
iOB 4.1	Shows respect for the trainee (e.g. for culture, language and experience)
iOB 4.2	Shows patience and empathy (e.g. by actively listening, reading non-verbal messages and encouraging dialogue)
iOB 4.3	Manages trainees' barriers to learning
iOB 4.4	Encourages engagement and mutual support between the trainees
iOB 4.5	Coaches the trainees
iOB 4.6	Supports the goal and training policies of the operator/ATO and authority
iOB 4.7	Shows integrity (e.g. honesty and professional principles)
iOB 4.8	Demonstrates acceptable personal conduct, acceptable social practices, content expertise, a model for professional and interpersonal behaviour
iOB 4.9	Actively seeks and accepts feedback to improve own performance

Assessment and evaluation	
Description:	Assesses the competencies of the trainee and contributes to continuous training system improvement
iOB 5.1	Complies with operator/ATO and authority requirements
iOB 5.2	Ensures that the trainee understands the assessment process
iOB 5.3	Applies the competency standards and conditions
iOB 5.4	Assesses trainee's competency (-ies)
iOB 5.5	Performs grading
iOB 5.6	Provides recommendations based on the outcome of the assessment
iOB 5.7	Makes decisions based on the outcome of assessments
iOB 5.8	Provides clear feedback to the trainee
iOB 5.9	Reports strengths and weaknesses of the training system (e.g. training environment, curriculum, assessment/evaluation) including feedback from trainees
iOB 5.10	Suggests improvements for the training system
iOB 5.11	Produces reports using appropriate forms and media

The recommended competency assessment grading system methodology for instructor competencies should be the same as the one used for pilots. This is the Venn model. More information can be found in ORO.FC.231 point (d)(1) and the related AMC and GM, as well as in the EASA EBT manual.

GM1 ORO.FC.230(a);(b);(f) Recurrent training and checking

MIXED EVIDENCE-BASED RECURRENT TRAINING AND CHECKING OF FLIGHT CREW CONDUCTED IN FLIGHT SIMULATION TRAINING DEVICES (FSTDs)

ICAO has developed Doc 9995 'Manual of Evidence-based Training', followed by the EASA EBT manual, which is intended to provide guidance to the competent ~~civil aviation~~ authorities, operators and approved training organisations ~~in~~ on the recurrent assessment and training of pilots by establishing a new methodology for the development and conduct of a recurrent assessment and training ~~and assessment~~ programme, titled evidence-based training (EBT).

~~'Evidence based Training(EBT)' means training and assessment based on operational data that is characterised by developing and assessing the overall capability of a trainee across a range of core competencies rather than by measuring the performance during individual events or manoeuvres.~~

ICAO Doc 9995 and the EASA EBT manual are ~~is~~ the reference documents for operators seeking to implement mixed EBT. The purpose of this guidance material (GM) is to enable the implementation of

mixed EBT according to the principles established in ICAO Doc 9995 and the EASA EBT manual ~~taking into account~~ in the context of the European regulatory framework.

In the current regulatory framework, it is possible to achieve ~~a~~ mixed EBT implementation ~~of EBT~~. Implementation of a mixed EBT programme means that some portion of the recurrent assessment and training is dedicated to the application of EBT. This includes the ~~L~~licence ~~P~~proficiency ~~C~~check (LPC) and the ~~O~~operator ~~P~~proficiency ~~C~~check (OPC).

As it is possible to combine LPC and OPC in ORO.FC, this GM is applicable to both checks. Therefore, the EBT ~~training~~ programme described in this GM refers to the recurrent training and checking of flight crew, including LPCs and OPCs.

The EBT ~~training~~ programme takes into account the differences between aircraft of different generations and the effect of these differences on training. The operator should acquire a thorough knowledge of ICAO Doc 9995 or the EASA EBT manual before implementing this GM. For applicability, see ICAO Doc 9995 ~~Chapter 3~~ or the EASA tables of applicable aeroplane/helicopter types by generation.

Mixed EBT programme

~~Within the current regulatory framework t~~The operator may undertake ~~a mixed~~ implementation of the mixed EBT programme according to this GM. The ICAO table of assessment and training topics is defined in ICAO Doc 9995 Chapter 4.3.1 and in Appendices 2 to 7; the EASA EBT programme is defined in AMC2 to AMC7 to ORO.FC.232.

The ~~baseline~~ mixed EBT programme provides operators with the flexibility to adapt programmes according to their specific ~~operator~~ risks. ~~Elements of the enhanced EBT programme may be implemented according to the definition and process described in ICAO Doc 9995 Chapter 5.~~

The operator should contact the competent authority in order for them to assess the application of the process described in ICAO Doc 9995 or the EBT manual ~~including, where applicable, the results from data analyses to support the enhanced EBT programme~~.

Personnel providing training and checking in EBT (Refers to AMC1 ORO.FC.230(d))

ICAO Doc 9995 Chapter 6, or EASA AMC1 and AMC2 to ORO.FC.146(c), ~~which is additional to EU regulations,~~ contain(s) the guidance for the assessment and training ~~and assessment~~ of personnel involved in the conduct of EBT.

Equivalency of malfunctions~~/Malfunction clustering~~ (Refers to ICAO Doc 9995 Paragraph 3.8.3)

According to the concept of EASA and ICAO Doc 9995 Chapter 3.8.3, major failures reduce the capability of the aircraft or the ability of the crew to cope with operating conditions to the extent that there would be a significant reduction in functional capabilities, significant increase in crew workload or in conditions impairing crew efficiency.

Clusters of major failures of aircraft systems are determined by reference to malfunction characteristics and the underlying elements of crew performance required to manage them. ~~Malfunction clustering~~ Equivalency of malfunctions may be used to guide the operator towards the implementation of ~~an~~ a mixed EBT programme according to AMC1 ORO.FC.230(a)(4)(i)(A) and ORO.FC.145(d).

Conduct of ~~L~~licence and ~~O~~operator ~~P~~proficiency ~~C~~checks

The EASA EBT programme described in ORO.FC.231 and the ICAO EBT programme described in ICAO Doc 9995 contain~~s~~ modules with three phases: the EVAL ~~evaluation phase~~, the MT ~~manoeuvres training phase~~, and the SBT ~~scenario-based training phase~~. In order to comply with the ~~existing~~ regulatory framework, in the mixed EBT programme the LPC and OPC requirements are fulfilled by a combination of the EVAL ~~evaluation phase~~ and the manoeuvres validation phase, which replaces the MT ~~manoeuvres training phase~~ described in the EASA EBT programme or ICAO Doc 9995. The manoeuvres validation phase is defined in Section 2 ~~3~~ below. This is a form of mixed EBT implementation, which is described as follows:

1. **Evaluation phase:** This includes check scenarios referred to in Part-FCL Appendix 9 within an ~~accepted~~ approved mixed EBT programme.

   In order to facilitate the provision of simple and realistic scenarios in accordance with ICAO Doc 9995 Chapters 3.8 and 7.4, the EVAL ~~evaluation phase~~ is not intended to be a comprehensive assessment of all Part-FCL Appendix 9 items; nevertheless, the list below includes the items that should be included in the EVAL ~~evaluation phase~~ only.

	Part-FCL or Part-ORO reference	Description
AEROPLANES HELICOPTERS	Part-FCL Appendix 9 Paragraph 6	*The examiner may choose between different skill test or proficiency check scenarios containing simulated relevant operations developed and approved by the competent authority. Full-flight simulators and other training devices, when available, shall be used, as established in this Part.*
AER	Part-FCL Appendix 9 Paragraph 16 of section B	*The test or check should be accomplished under instrument flight rules (IFRs), if instrument rating (IR) is included, and as far as possible be accomplished in a simulated commercial air transport environment. An essential element to be checked is the ability to plan and conduct the flight from routine briefing material.*

OPLANES	Part-FCL Appendix 9 Item 1.4	*Use of checklist prior to starting engines, starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies.*
	Part-FCL Appendix 9 Item 1.6	*Before take-off checks.*
	Part-FCL Appendix 9 Item 3.8.1*	*Adherence to departure and arrival routes and ATC instructions.* *The starred item (*) shall be flown solely by reference to instruments. If this condition is not met during the skill test or proficiency check, the type rating will be restricted to VFR only.*
HELICOPTERS	Part-FCL Appendix 9 Paragraph 2 of section C	In case of proficiency check for an IR, the applicant shall pass section 5 of the proficiency check. Failure in more than three items will require the applicant to take the entire section 5 again. An applicant failing not more than three items shall take the failed items again. Failure in any item of the re-check or failure in any other items of section 5 already passed will require the applicant to take the entire check again.
	Part-FCL Appendix 9 Item 1.3.	*Starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies*
	Part-FCL Appendix 9 Item 1.4	Taxiing/air taxiing in compliance with air traffic control instructions or with instructions of an instructor
	Part-FCL Appendix 9 Item 1.5	Pre-take-off procedures and checks
	Part-FCL Appendix 9 Item 5.2*	Adherence to departure and arrival routes and ATC instructions
		The starred item (*) shall be flown solely by reference to instruments. If this condition is not met during the skill test or proficiency check, the type rating will be restricted to VFR only.

2. Manoeuvres validation phase: The purpose of the manoeuvres validation phase is to check the handling skills necessary to fly critical flight manoeuvres so that they are maintained to a defined level of proficiency. This replaces the MT ~~manoeuvres training phase~~ described in ICAO Doc 9995 Chapter 7.5 and ORO.FC.231(a)(2)(iv)(B)(a). Manoeuvres in this context are not part of the line-orientated flight scenario; they are a sequence of deliberate actions to achieve a prescribed flight path or to perform a prescribed event to a prescribed outcome. All remaining items listed in Part-FCL Appendix 9, and not included in the EVAL ~~evaluation phase~~, should be included here. The manoeuvres listed in Doc 9995 or the EASA table of assessment and training topics for the MT that do not form part of the Part-FCL Appendix 9 mandatory items may be trained after the

manoeuvres validation phase.

3. **Scenario-based training phase:** The purpose of the SBT ~~scenario-based training phase~~ is to further develop pilot core competencies in a learning environment. This does not form part of any LPC or OPC requirement.

It should be noted that if the operator is following an alternative means of compliance to ORO.FC.230 (b) Operator ~~P~~proficiency ~~C~~check, the equivalence of using EBT evaluation and manoeuvres validation phases may no longer exist.

Conduct of CRM assessment

The operator is advised to use the EBT grading system (AMC1 ORO.FC.231(d)(1)) and the EBT competencies (AMC1 ORO.FC.231(b)) for the non-technical skills assessment.

Additional guidance on mixed EBT implementation is available in the EASA checklist 'Oversight guidance for transition to Mixed EBT Implementation'.

AMC1 ORO.FC.231(a) Evidence-based training

EBT PROGRAMME SUITABILITY

An operator's EBT programme is one in which:

(a) training is focused on development of competencies, rather than repetition of tasks;

(b) the development of the programme is based on data-driven EBT training topics with a link to the operator's competency framework;

(c) training needs are addressed through training based on underlying competencies;

(d) the programme includes:

(1) an evaluation phase to identify training needs based on competencies and collect population-based data; to identify the training needs means, the root cause of the deficiency observed should be identified rather than the symptoms of the deficiency;

(2) a manoeuvres training phase (skill retention): to train skill-based manoeuvres (body memory actions). These manoeuvres should place a significant demand on a proficient pilot; and

(3) a scenario-based training phase to focus on identified training needs based on competencies rather than repetition of tasks;

(e) the programme includes the conduct of objective observations based on a competency framework, and documents evidence of the behaviour observed;

(f) there is a customisation of syllabi:

(1) The operator should describe in the operations manual the procedure to customise syllabi. It should include how to:

(i) select the example scenario elements within a training topic that should be included in the EBT programme; and

(ii) contextualise the example scenario elements based on the operator's operational data (e.g. input from SMS, FDM programme, etc.) and training data.

(2) This customisation should be based on evidence both internal and external to the operator;

(g) performance is evaluated using a competency-based grading system;

(h) instructors grade competencies based on observable behaviours (OBs);

(i) instructors grade the pilot using a defined methodology — observe, record, classify and assess/evaluate (ORCA) is recommended;

(j) instructors have completed the EBT instructor standardisation;

(k) instructors have sufficient concordance based on defined criteria (instructor concordance assurance programme);

(l) the analysis of the pilot's performance is used to determine competency-based training needs;

(m) there is a range of teaching styles during simulator training to accommodate trainee learning needs; and

(n) facilitation techniques in debriefing are incorporated.

AMC2 ORO.FC.231(a) Evidence-based training

UPSET PREVENTION AND RECOVERY TRAINING (UPRT) FOR COMPLEX MOTOR-POWERED AEROPLANES WITH A MAXIMUM OPERATIONAL PASSENGER SEATING CONFIGURATION (MOPSC) OF MORE THAN 19

Operators approved for EBT should follow the provisions for upset prevention and recovery training (UPRT) contained in AMC1 ORO.FC.220&230 'Operator conversion training and checking & recurrent training and checking'. These provisions should be included in the tables of assessment and training topics detailed in ORO.FC.232.

AMC3 ORO.FC.231(a) Evidence-based training

PERSONNEL CONDUCTING ASSESSMENT AND PROVIDING TRAINING

(a) Ground and refresher training should be provided by suitably qualified personnel.

(b) For non-EBT assessment and training: flight training should be provided by a flight instructor (FI), type rating instructor (TRI) or class rating instructor (CRI) or, in the case of the FSTD content, a synthetic flight instructor (SFI). The FI, TRI, CRI or SFI should satisfy the operator's standardisation, experience and knowledge requirements.

(c) Emergency and safety equipment training should be provided by suitably qualified personnel.

(d) CRM training should be provided by an EBT instructor or, for the classroom CRM training, a CRM trainer.

(e) Additional personnel requirements are described in ORO.FC.146 and ORO.FC.231 and in the associated AMC and GM.

GM1 ORO.FC.231(a) Evidence-based training

RECURRENT CREW RESOURCE MANAGEMENT (CRM)

Operators implementing EBT in accordance with ORO.FC.231 may demonstrate compliance with ORO.FC.115 by showing how the recurrent CRM requirements are integrated within the operator's EBT programme. An example of how this may be done is provided in the safety promotion material of EASA (e.g. 'EASA EBT manual´).

GM2 ORO.FC.231(a) Evidence-based training

EBT PROGRAMME — TRANSITION FROM MIXED EBT

The operator may agree with the competent authority the transition measures from mixed EBT to EBT baseline, which may include amongst others that the 3-year programme may include one or more modules in mixed EBT and one or more modules in EBT baseline, provided that all assessment and training topics in ORO.FC.232 are completed in the 3-year programme.

GM3 ORO.FC.231(a) Evidence-based training

CUSTOMISATION OF THE EBT PROGRAMME (SYLLABI)

(a) Syllabi can be customised at three different steps:

(1) The first step would be a syllabus for the whole pilots' population (customisation only at type rating level and/or aircraft generation level). At this step, the operator customises the example scenario elements based on relevant operational data (safety management system, state safety plan, OSD, occurrences, manufacturer data, etc.), and the training topics within the module are the same (same syllabus). At this level, it may be necessary to have a different example scenario element for the different crews within the same module to ensure that pilots are exposed to surprise and unexpected events and thus avoid pilots knowing all the details of the simulator session beforehand.

(2) The second step would be a different syllabus or part of it for the different populations of pilots. For example, some parts of the syllabus are different for the first officers and the captain, or the syllabus is different for the B747 pilots or for the Airbus pilots, etc. At this step, the module or part of the module is different for each population; this may include a different example scenario element for each population (or a different training topic; however, the customisation at training topic level is more difficult to control).

(3) The third step would be syllabi tailored to the individual pilot (pilot customisation — individual syllabus). This step is linked to the procedures established for the tailored training and the additional training of the pilots following the VENN model.

(b) The procedure to describe the customisation of syllabi must be described in the OM. Customisation is based on evidence that can be gathered on three different levels, two from the inner loop, one from the outer loop.

(1) Inner loop

(i) Individual evidence based on training data (e.g. grading metrics, training reports, questionnaires, etc.), analysed either for an individual pilot or a group of pilots (for example, all first officers, all B747 pilots, all pilots flying an Airbus model, etc.).

(ii) Operator-specific evidence gathered through the safety management process in accordance with ORO.GEN.200.

(2) Outer loop

Evidence gathered from external sources such as authorities (e.g. state safety plan, etc.), OEMs (e.g. OEBs, OSD, safety documentation such as getting to grip, etc.), etc.

GM4 ORO.FC.231(a) Evidence-based training

EBT PROGRAMME

Further guidance on the EBT programme can be found in the EASA EBT manual.

AMC1 ORO.FC.231(a)(1) Evidence-based training

EXPERIENCE IN MIXED EBT TO SUBSTITUTE ORO.FC.230

(a) The operator should have a minimum experience of 3 years of a mixed EBT programme. Note: More information on a mixed EBT programme is provided in GM1 ORO.FC.230(a);(b);(f) and in GM2 ORO.FC.A.245.

(b) The operator should demonstrate 2 years of an instructor concordance assurance programme.

(c) The operator should demonstrate 1 year of a valid equivalency of malfunctions.

(d) The operator should demonstrate 1 year of integration of the training data in the customisation of the EBT programme and SMS data for the contextualisation of the example scenario elements.

(e) The operator should demonstrate that there is a verification of the grading system and feedback is provided to the training system performance and to the instructor standardisation concordance assurance.

SUBSTITUTION OF THE REQUIREMENTS OF ORO.FC.230

(f) One complete EBT module substitutes one operator proficiency check (OPC).

(g) The line evaluation of competence substitutes the line check.

AMC1 ORO.FC.231(a)(2) Evidence-based training

EBT PROGRAMME AND ASSSESMENT AND TRAINING TOPICS — RESILIENCE

(a) Compliance with the table of assessment and training topics ensures that crews are presented with an array of realistic changing events that allow for resilience development purposes.

(b) The EBT programme should be designed observing the following principles for resilience development:

(1) Resilience, surprise, and unexpected events

The EBT programme should be designed in such a way that in every cycle the simulator session (or part of it) allows variations so that the pilots are not familiar with the scenarios presented in the simulator session. Variations should be the focus of EBT programme design, and should not be left to the discretion of individual instructors, in order to preserve programme integrity and fairness.

(2) Resilience and decision-making (dilemma)

The EBT programme should be designed in such a way that in every cycle the crews are exposed to a scenario where more than one possible and less than ideal solutions exist, with some unfavourable conditions attached to each solution.

AMC2 ORO.FC.231(a)(2) Evidence-based training

VALIDITY OF THE EBT MODULE

(a) The validity period should be counted from the end of the month when the module was completed. When the module is undertaken within the last 3 months of the validity period, the new validity period should be counted from the original expiry date.

(b) In the context of ORO.FC.130 point (a), the pilot should have a valid module.

GM1 ORO.FC.231(a)(2) Evidence-based training

EBT PROGRAMME AND ASSSESMENT AND TRAINING TOPICS — RESILIENCE

(a) For resilience development, crews should be exposed to an array of realistic changing scenarios. The strategies developed by the crews whilst coping with different causes of action will create opportunities for resilience development.

(b) Resilience and surprise

The operator may create a comprehensive list of scenarios to ensure that each crew is trained in different scenarios avoiding the same scenarios for all crews. This relates to training topic ‘surprise’ and to the customisation of the EBT programme.

(c) Resilience and unexpected events

Exposing crews to rare, fortuitous, events may prepare crews to deal with other unexpected events. For instance, the table of assessment and training topics offers infrequent example

scenario elements such as flying over 'no fly zone', etc. The operator may also take infrequent examples from occurrence reporting, or SMS, or manufacturer reports, etc. This relates to decision-making (PSD) — see OB 6.9 'Demonstrates resilience when encountering an unexpected event'.

(d) Dilemma

The operator may create scenarios suitable for training of threat assessment, threat management processes and option generation, leading to an optimum decision-making process. At programme design, as in real life, one 'correct answer' should be avoided; instead, the EBT programme should offer the crews a number of less than ideal courses of actions; some with unfavourable conditions attached. This relates to decision-making (PSD) and to the contextualisation of the example scenario element.

GM2 ORO.FC.231(a)(2) Evidence-based training

EBT PROGRAMME —TRAINING PHASE — IN-SEAT INSTRUCTION (ISI)

(a) Effective monitoring and error detection are increasingly important when operating highly reliable automated aircraft.

(b) In-seat instruction may be used as a valuable tool to maintain and develop the training objectives of some of the training topics, such as skills of monitoring, cross-checking, error management, and recognition of mismanaged aircraft state.

GM3 ORO.FC.231(a)(2) Evidence-based training

EBT PROGRAMME —ORDER OF THE PHASES

The order of the phases is intended as follows:

(2) First the EVAL; and

(3) Second, and in a timely manner after the EVAL, the training phases. The training phases are the MT and the SBT and may be delivered in any order.

Further guidance can be found in the EASA EBT manual.

AMC1 ORO.FC.231(a)(3) Evidence-based training

EBT PROGRAMME — ENROLMENT

(a) Enrolment is when a flight crew member commences the first EBT module.

(b) A flight crew member is considered to leave the operator's EBT programme (de-enrolled) when the operator is no longer responsible for the administrative action for the flight crew's licence revalidation under an EBT programme.

(c) The operator should inform the flight crew members who fail to demonstrate an acceptable level of competence and leave the operator's EBT programme (de-enrolled) that they should not exercise the privileges of that type rating.

GM1 ORO.FC.231(a)(3) Evidence-based training

MODULE SEPARATION BY A PERIOD OF NOT LESS THAN 3 MONTHS

(a) The separation begins when the first module finished (end of the training phase) and the second module begins (EVAL).

(b) When the operator decides to do more than two modules during the validity period of the type rating (approximately 1 year), the operator may count the 3 months of separation between the first and the third module if it so wishes.

(c) The separation of 3 months applies even between modules in different validity periods.

AMC1 ORO.FC.231(a)(4) Evidence-based training

INSTRUCTOR CONCORDANCE ASSURANCE PROGRAMME (ICAP)

(a) The ICAP should be able to identify areas of weak concordance to drive improvement in the quality and validity of the grading system.

(b) The ICAP should be adapted to the size and complexity of the instructors' group and the complexity of the operator's EBT programme.

(c) Complex operators should include an ICAP-specific data analysis, demonstrating:

(1) instructor-group assessment homogeneity (agreement);

(2) instructor assessment accuracy (alignment).

(d) The operator should verify the concordance of the instructors:

(1) once every cycle;

(2) for a sufficient number of competency-grade combinations.

(e) The operator should establish procedures to address those instructors who do not meet the standards required.

(f) The operator should maintain a list with the EBT instructors qualified to deliver the EBT programme.

GM1 ORO.FC.231(a)(4) Evidence-based training

INSTRUCTOR CONCORDANCE ASSURANCE PROGRAMME (ICAP)

(a) Instructor concordance is a tool for continuous improvement of the EBT programme as data reliability results in a more accurate and effective training.

(b) The operator may have a more frequent, or even a continuous, assessment of concordance as it provides more opportunities to improve.

(c) Concordance standards are normally set by the operator; however, the competent authority may recommend criteria, as licences' revalidation is performed under EBT.

(d) Individual instructor concordance may be verified:

(1) through uniform standardisation material where at least three different levels of performance are included and for all the competencies at a frequency of 72 months;

(2) by reference to the analysis of the data produced by the instructor every 12 months; normalisation may be necessary as there is no homogeneity of all EBT modules and the pilots that the instructor assessed; and

(e) Instructor-group assessment homogeneity (agreement) may be inferred from instructors who have observed the same content.

(f) Instructor assessment accuracy (alignment) may be inferred from comparing instructor assessments with an 'assessment standard' consisting of correctly identified competency(-ies) and correctly identified grade levels. Neither the competency(-ies) nor the grade level(s) may be communicated in advance to the instructors. The assessment standards may be set by consensus of a standards group, in order to guard against individual biases.

(g) When the operator uses a small group of instructors (e.g. 10), the data-driven concordance assurance programme may be directly integrated into the annual refresher training, removing the need for the above guidance.

(h) Operators with a complex group of instructors (e.g. a big rotation of instructors, subcontracted instructors, big number of instructors, many different fleets, etc.) may need to implement a more extensive concordance assessment system.

AMC1 ORO.FC.231(a)(5) Evidence-based training

CONTINGENCY PROCEDURES FOR UNFORESEEN CIRCUMSTANCES THAT MAY AFFECT THE DELIVERY OF THE MODULE

(a) The operator should detail in the EBT programme the contingency procedures in the event of unforeseen circumstances that may affect the delivery of the module (e.g. long-term sick pilot).

(b) In case of unforeseen interruption of a module at any point, the missing parts of the module should be rescheduled.

(1) The pilot may continue line flying until the expiry of the validity period unless the performance observed was below the minimum acceptable level.

(2) If the interruption results in an instructor change, the operator should ensure that the instructor completing the module is provided with the details of the performance of the pilots.

(c) In case the pilot misses modules and does not meet the requirements of recent experience (FCL.060):

(1) when the pilot misses one module out of the two modules required, the EVAL of the missing module should be rescheduled before the pilot can resume line operations. The MT and SBT phases of the missing module should be completed 30 days after the EVAL or before the expiry date, whichever occurs first;

(2) when the pilot misses one module in the preceding 12 months but the pilot's rating is expired by less than 3 months, the missing module should be rescheduled before the pilot can resume line operations;

(3) when the pilot misses one module in the preceding 12 months but the pilot's rating is expired by longer than 3 months but shorter than 1 year, the missing module should be rescheduled. The evaluation should be delivered by an EBT instructor (or instructors) with examiner privileges before the pilot can resume line operations;

(4) when the pilot misses two modules and the pilot's rating is valid:

(i) one module should be rescheduled before the pilot can resume line operations using an EBT instructor (or instructors) with examiner privileges; and

(ii) training topics B and C of the other module should be rescheduled before the expiry date.

In such case, the 3-month separation requirement between modules may not apply;

(5) when the pilot misses two modules and the pilot's rating is expired by less than 1 year:

(i) one module should be rescheduled using an EBT instructor (or instructors) with examiner privileges; and

(ii) training topics B and C of the other module should be rescheduled before the pilot can resume line operations.

In such case, the period of 3-month separation between modules may not apply; and

(6) if the amount of time elapsed since the expiry of the rating is more than 1 year, the pilot is de-enrolled. AMC1 FCL.625(c) 'IR — Validity, revalidation and renewal' and AMC1 FCL.740(b)'Validity and renewal of class and type ratings' apply.

(d) In the case of other situations not covered by points (b) or (c), point (a) applies.

GM1 ORO.FC.231(a)(5) Evidence-based training

CONTINGENCY PROCEDURES — RATINGS RENEWAL

(a) The renewal of ratings (e.g. type rating or instrument rating) in EBT follows the Annex I (Part-FCL) to the Aircrew Regulation provisions (IRs and AMC) and is complemented with the provisions covered in AMC1 ORO.FC.231(a)(5). The ATO or the operator will determine the amount of training following Part-FCL; however, as EBT combines assessment and training, the following guidance is applicable:

(1) Expiry shorter than 3 months may not require additional training in Part-FCL. In EBT, the missing module is rescheduled with an EBT instructor. Following that, the EBT manager for the type rating may renew the licence without extra training, as the EBT programme is now completed (at least two modules in the last 12 months).

(2) In Part-FCL, when the expiry is longer than 3 months but shorter than 1 year, there need to be two training sessions. In EBT, there are two cases:

(i) One module is missing: the pilot must complete the missing module (two simulator sessions) before resuming line operations. Following that, the EBT manager for the type rating may renew the licence in accordance with Appendix 10 as the EBT programme is now completed (two modules in the last 12 months).

(ii) Two modules are missing: the pilot must complete one module (two simulator sessions) and training topics B and C of the other missing module (an extra simulator session) with a total of three simulator sessions. Training data is gathered in a short time period; therefore, an EBT instructor with examiner privilege is involved to ensure the proficiency of the pilot.

(b) In case of an expiry longer than 1 year, the requirements of Part-FCL will be followed and the proficiency checks will be performed in accordance with Appendix 9 as the EBT system may not have sufficient training data for the pilot.

(1) Expiry longer than 1 year but shorter than 3 years: a minimum of three training sessions in which the most important malfunctions in the available system are covered plus a proficiency check in accordance with Appendix 9 to renew the licence.

(2) Expiry longer than 3 years: the pilot should undergo the training for the initial issue of the type rating.

(3) Expiry longer than 7 years: the pilot should undergo the training for the initial issue of the instrument rating.

AMC1 ORO.FC.231(b) Evidence-based training

RECOMMENDED EBT COMPETENCIES (EASA COMPETENCY FRAMEWORK)

(a) The operator should include in its EBT programme at least the following competencies:

Application of knowledge (KNO)	
Description:	Demonstrates knowledge and understanding of relevant information, operating instructions, aircraft systems and the operating environment
OB 0.1	Demonstrates practical and applicable knowledge of limitations and systems and their interaction
OB 0.2	Demonstrates the required knowledge of published operating instructions
OB 0.3	Demonstrates knowledge of the physical environment, the air traffic environment and the operational infrastructure (including air traffic routings, weather, airports)
OB 0.4	Demonstrates appropriate knowledge of applicable legislation.
OB 0.5	Knows where to source required information
OB 0.6	Demonstrates a positive interest in acquiring knowledge
OB 0.7	Is able to apply knowledge effectively

Application of procedures and compliance with regulations (PRO)	
Description:	Identifies and applies appropriate procedures in accordance with published operating instructions and applicable regulations
OB 1.1	Identifies where to find procedures and regulations
OB 1.2	Applies relevant operating instructions, procedures and techniques in a timely manner
OB 1.3	Follows SOPs unless a higher degree of safety dictates an appropriate deviation
OB 1.4	Operates aircraft systems and associated equipment correctly
OB 1.5	Monitors aircraft systems status
OB 1.6	Complies with applicable regulations
OB 1.7	Applies relevant procedural knowledge

Communication (COM)	
Description:	Communicates through appropriate means in the operational environment, in both normal and non-normal situations
OB 2.1	Determines that the recipient is ready and able to receive information
OB 2.2	Selects appropriately what, when, how and with whom to communicate
OB 2.3	Conveys messages clearly, accurately and concisely
OB 2.4	Confirms that the recipient demonstrates understanding of important information
OB 2.5	Listens actively and demonstrates understanding when receiving information
OB 2.6	Asks relevant and effective questions
OB 2.7	Uses appropriate escalation in communication to resolve identified deviations
OB 2.8	Uses and interprets non-verbal communication in a manner appropriate to the organisational and social culture
OB 2.9	Adheres to standard radiotelephone phraseology and procedures
OB 2.10	Accurately reads, interprets, constructs and responds to datalink messages in English

Aeroplane flight path management — automation (FPA)	
Description:	Controls the flight path through automation
OB 3.1	Uses appropriate flight management, guidance systems and automation, as installed and applicable to the conditions
OB 3.2	Monitors and detects deviations from the intended flight path and takes appropriate action
OB 3.3	Manages the flight path to achieve optimum operational performance
OB 3.4	Maintains the intended flight path during flight using automation whilst managing other tasks and distractions
OB 3.5	Selects appropriate level and mode of automation in a timely manner considering phase of flight and workload
OB 3.6	Effectively monitors automation, including engagement and automatic mode transitions

Aeroplane flight path management — manual control (FPM)	
Description:	Controls the flight path through manual control
OB 4.1	Controls the aircraft manually with accuracy and smoothness as appropriate to the situation
OB 4.2	Monitors and detects deviations from the intended flight path and takes appropriate action
OB 4.3	Manually controls the aeroplane using the relationship between aeroplane attitude, speed and thrust, and navigation signals or visual information
OB 4.4	Manages the flight path to achieve optimum operational performance
OB 4.5	Maintains the intended flight path during manual flight whilst managing other tasks and distractions
OB 4.6	Uses appropriate flight management and guidance systems, as installed and applicable to the conditions
OB 4.7	Effectively monitors flight guidance systems including engagement and automatic mode transitions

Leadership & teamwork (LTW)	
Description:	Influences others to contribute to a shared purpose. Collaborates to accomplish the goals of the team
OB 5.1	Encourages team participation and open communication
OB 5.2	Demonstrates initiative and provides direction when required

OB 5.3	Engages others in planning
OB 5.4	Considers inputs from others
OB 5.5	Gives and receives feedback constructively
OB 5.6	Addresses and resolves conflicts and disagreements in a constructive manner
OB 5.7	Exercises decisive leadership when required
OB 5.8	Accepts responsibility for decisions and actions
OB 5.9	Carries out instructions when directed
OB 5.10	Applies effective intervention strategies to resolve identified deviations
OB 5.11	Manages cultural and language challenges, as applicable

Problem-solving — decision-making (PSD)	
Description:	Identifies precursors, mitigates problems, and makes decisions
OB 6.1	Identifies, assesses and manages threats and errors in a timely manner
OB 6.2	Seeks accurate and adequate information from appropriate sources
OB 6.3	Identifies and verifies what and why things have gone wrong, if appropriate
OB 6.4	Perseveres in working through problems whilst prioritising safety
OB 6.5	Identifies and considers appropriate options
OB 6.6	Applies appropriate and timely decision-making techniques
OB 6.7	Monitors, reviews and adapts decisions as required
OB 6.8	Adapts when faced with situations where no guidance or procedure exists
OB 6.9	Demonstrates resilience when encountering an unexpected event

Situation awareness and management of information (SAW)	
Description:	Perceives, comprehends and manages information and anticipates its effect on the operation
OB 7.1	Monitors and assesses the state of the aeroplane and its systems
OB 7.2	Monitors and assesses the aeroplane’s energy state, and its anticipated flight path
OB 7.3	Monitors and assesses the general environment as it may affect the operation

OB 7.4	Validates the accuracy of information and checks for gross errors
OB 7.5	Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected
OB 7.6	Develops effective contingency plans based upon potential risks associated with threats and errors
OB 7.7	Responds to indications of reduced situation awareness

Workload management (WLM)	
Description:	Maintains available workload capacity by prioritising and distributing tasks using appropriate resources
OB 8.1	Exercises self-control in all situations
OB 8.2	Plans, prioritises and schedules appropriate tasks effectively
OB 8.3	Manages time efficiently when carrying out tasks
OB 8.4	Offers and gives assistance
OB 8.5	Delegates tasks
OB 8.6	Seeks and accepts assistance, when appropriate
OB 8.7	Monitors, reviews and cross-checks actions conscientiously
OB 8.8	Verifies that tasks are completed to the expected outcome
OB 8.9	Manages and recovers from interruptions, distractions, variations and failures effectively while performing tasks

AMC2 ORO.FC.231(b) Evidence-based training

ADAPTED COMPETENCY MODEL

(a) An operator seeking to develop an adapted competency model under ORO.GEN.120 should:

(1) identify positive behaviours and use language that avoids ambiguity; and

(2) demonstrate equivalence to the recommended EBT competencies in AMC1 ORO.FC.231(b).

(b) In order to demonstrate equivalence, the operator should map the competencies and observable behaviours to the recommended EBT competencies.

(c) When the operator is translating AMC1 ORO.FC.231(b) into its common language, the application of ORO.GEN.120 may not be necessary. The translation may not be literal.

GM1 ORO.FC.231(b) Evidence-based training

ADAPTED COMPETENCY MODEL/POSITIVE OBSERVABLE BEHAVIOUR

(a) OBs should describe behaviours that contribute to positive pilot performance.

(b) The indicators should clearly describe how a competency is expected to be demonstrated by a crew member in the context of the operational environment.

(c) If the operator makes small adjustments in the wording used to describe the OBs of the EASA competency framework in order to improve the understanding of the pilots while maintaining the same meaning, it may be considered as EASA competency framework and not as an adapted competency model.

AMC1 ORO.FC.231(c) Evidence-based training

TRAINING SYSTEM PERFORMANCE — FEEDBACK PROCESS

(a) Feedback process is the continuous process of collecting and analysing assessment and training data from an EBT programme.

(b) The feedback process should use defined metrics to collect data in order to:

(1) identify trends and ensure corrective action where necessary;

(2) identify collective training needs;

(3) review, adjust and continuously improve the training programme;

(4) further develop the training system; and

(5) standardise the instructors (when the standardisation and concordance assurance programme is integrated into the training system performance).

(c) The following defined metrics should be collected as a minimum:

(1) level 0 grading metrics (competent metrics): data metrics providing the information whether the pilot(s) is (are) competent or not;

(2) level 1 grading metrics (competency metrics): quantifiable data from the grading system — numeric grade of the competencies (e.g. 1 to 5);

(3) level 2 grading metrics (observable behaviour metrics): the instructors record predetermined OBs during the session;

(4) level 3 grading metrics (other metrics): the instructors may record other predetermined data (e.g. specific tasks, actions, questions, etc.).

(d) Alternatively, where a system for the measurement of training system performance already exists, the operator may use it and, if necessary, adapt it to meet the demands of EBT.

AMC2 ORO.FC.231(c) Evidence-based training

FEEDBACK PROCESS — DATA PROTECTION – GRADING SYSTEM

(a) The objective of protecting the EBT data is to avoid inappropriate use of it in order to ensure the continued availability of such data, to maintain and improve pilot competencies.

(b) The data access and security policy should restrict information access to authorised persons.

(c) The data access and security policy should include the measures to ensure the security of the data (e.g. information security standard).

(d) The data access and security policy (including the procedure to prevent disclosure of crew identity) should be agreed by all parties involved (airline management and flight crew member representatives nominated either by the union or the flight crew themselves).

(e) The data access and security policy should be in line with the organisation safety policy in order to not make available or to not make use of the EBT data to attribute blame or liability.

(f) The operator may integrate the security policy within other management systems already in place (e.g. information security management).

GM1 ORO.FC.231(c) Evidence-based training

TRAINING SYSTEM PERFORMANCE — FEEDBACK PROCESS — METRICS

(a) Training metrics within the feedback process are a valuable source of data. Typical metrics may include but are not limited to:

(1) differences in success rates between training topics;

(2) the trainees' feedback (e.g. surveys), which provides a different perspective as to the quality and effectiveness of the training;

(3) instructor concordance assurance: this system is important to measure the effectiveness of the instructor calibration process. It is important to remind that the purpose of this system is not to spy on instructors or to pressure individuals to change their grading;

(4) level 0 grading metrics (competent metrics): Metrics examples: distribution of pilots not competent after the SBT, distribution of pilots not competent in the EVAL and competent after the SBT;

(5) level 1 grading metrics (competency metrics): Metrics examples:

(i) distribution of level of performance within the range of competencies;

(ii) differences in grades between aircraft types;

(6) level 2 grading metrics (observable behaviour metrics): e.g. in specific example scenario elements. Metrics example: differences in displaying OBs between ranks of pilots;

(7) level 3 grading metrics (other metrics such as data based on tasks): for instance, did the pilot calculate the landing distance? Or, did the pilots make a call-out in a specific manoeuvre? This level is usually linked to data collection of the SMS or EBT feedback loop

(e.g. was the call-out of the TCAS manoeuvre correct? 'TCAS I have control'). Metrics example: distribution of errors for various training scenarios and aircraft types.

(8) during the simulator session, the operator may consider the level of grading metrics that the instructor needs to collect, taking into consideration the workload of the instructor.

(b) Training metrics are an invaluable component in supporting an EBT programme, but they must be placed in the context of operational data because only the latter can justify the importance of specific training. For this purpose, data from the line evaluation of competence is important to measure the effectiveness of the EBT programme in operations. It may include data from the process for the monitoring of line operations.

(c) Complex operators may, in the context of their safety management system, establish a safety action group dedicated to training: 'training safety action group'. This may be a best practice to meet the implementing rule.

GM2 ORO.FC.231(c) Evidence-based training

FEEDBACK PROCESS — DATA PROTECTION – GRADING SYSTEM

(a) The data access and security policy may, as a minimum, define:

(1) a policy for access to information only to specifically authorised persons identified by their position in order to perform their duties. The required authorised person(s) does (do) not need to be the EBT manager; it could be the EBT programme manager or a third party mutually acceptable to unions or staff and management. The third party may also be in charge of ensuring the correct application of the data access and security policy (e.g. the third party is the one activating the system to allow access to the authorised persons);

(2) the identified data retention policy and accountability;

(3) the measures to ensure that the security of the data includes the information security standard (e.g. information security management systems standard e.g. ISO 2700x-ISO 27001, NIST SP 800-53, etc.);

(4) the method to obtain de-identified crew feedback on those occasions that require specific follow-up; and

(b) When there is a need for data protection, it is preferable to de-identify the data rather than anonymise it.

AMC1 ORO.FC.231(d)(1) Evidence-based training

GRADING SYSTEM

(a) The grading system should provide quantifiable data for the measurement of the training system performance.

(b) The grading scale should be 1 to 5, where:

(1) Grade 1 — NOT COMPETENT — determines that the minimum acceptable level of performance was not achieved for the conduct of line operations. An outcome of ADDITIONAL TRAINING REQUIRED and level 2 grading metrics should be recorded.

(2) Grade 2 to 5 determine an outcome of COMPETENT for the conduct of line operations.

(3) Grade 2 (below the average) determines that the minimum acceptable level was achieved for the conduct of line operations. Additionally, level 2 grading metrics should be recorded.

Minimum performance indicates a need for training (e.g. tailored or additional) to elevate performance. It includes:

(i) a competency graded continuously with 2 in multiple modules, or

(ii) the majority of competencies graded with 2 in a module.

(4) Grade 3 is the average.

(5) Grade 4 determines that the pilot is above the average.

(6) Grade 5 (exemplary) determines that the pilot is above the average and the outcome is enhanced safety, effectiveness and efficiency.

(c) The operator should develop further grading guidance to the above points to help the instructors determine the grade of the pilots they assess.

AMC2 ORO.FC.231(d)(1) Evidence-based training

GRADING SYSTEM — ALTERNATIVE SYSTEM

(a) An operator seeking to develop an alternative grading system under ORO.GEN.120 should:

(1) provide quantifiable data for the measurement of the training system performance; and

(2) demonstrate equivalence to the recommended grading system in AMC1 ORO.FC.231(d)(1).

(b) The grading scale for each competency should:

(1) determine the grade at which the performance is considered:

(i) NOT COMPETENT for the conduct of line operations. An outcome of ADDITIONAL TRAINING REQUIRED and level 2 grading metrics should be recorded; and

(ii) COMPETENT for the conduct of line operations; and

(2) determine for the pilot whose performance is considered competent for the conduct of line operations:

(i) if the pilot needs more training (e.g. tailored or additional training) to elevate their performance to the operator specified norm;

(ii) if the pilot is at the operator specified norm;

(iii) if the pilot is above the average (it can be one or more grades e.g. above the average and exemplary).

(c) The operator should develop further guidance to the above points to help the instructors determine the grade of the pilots they assess.

AMC3 ORO.FC.231(d)(1) Evidence-based training

RECOMMENDED CONDUCT OF THE GRADING — ORCA

(a) Grading the performance of flight crew members during an EBT module should include the following steps:

(1) **O**bserve performance (behaviours) during the simulator session.

(2) **R**ecord details of effective and ineffective performance (behaviours) observed during the simulator session ('record' in this context refers to instructors taking notes).

(3) **C**lassify observations against the OBs and allocate the OBs to each competency (or competencies), using amongst others the facilitation technique.

(4) **A**ssess and evaluate (grade): assess the performance by determining the root cause(s) according to the competency framework. Low performance would normally indicate the area of performance to be remediated in subsequent phases or modules. Evaluate (grade) the performance by determining a grade for each competency using a methodology defined by the operator.

(b) As a minimum, the instructor should grade all the observed competencies at:

(1) the end of the EVAL (de-briefing) by providing at least level 1 grading metrics;

(2) the end of the MT (de-briefing) by providing at least level 0 grading metrics; and

(3) at the end of the EBT module (de-briefing) by providing at least level 0 grading metrics (level 1 grading metrics are recommended).

AMC4 ORO.FC.231(d)(1) Evidence-based training

RECOMMENDED GRADING SYSTEM METHODOLOGY — VENN MODEL

(a) To grade a competency, the instructor should assess the associated OBs of each competency against the following dimensions by determining:

(1) what was the outcome of the threat management, error management and undesired aircraft state management relating specifically to the competency being assessed;

(2) how well the flight crew member demonstrated the OB(s) when they were required. This includes:

(i) how many OBs the flight crew member demonstrated over the EBT phase (e.g. EVAL, MT, SBT) when they were required; and

(ii) how often the flight crew member demonstrated the OB(s) when they were required;

Abbreviated word picture VENN model				
	TEM	Observable behaviours		
Grading	OUTCOME (1)	HOW WELL (2) =	HOW MANY (i)+	HOW OFTEN (ii)
1	unsafe situation	ineffectively	few, hardly any	rarely
2	not an unsafe situation	minimally acceptable	some	occasionally
3	safe situation	adequately	many	regularly
4	safe situation	effectively	most	regularly
5	enhanced safety, effectiveness and efficiency	in an exemplary manner	all, almost all	always

(b) Grades should be determined during each EBT module as follows:

(1) EVAL — overall performance of the phase at level 1 grading metrics.

(2) MT — overall performance of the phase at level 0 grading metrics. When the phase is graded 'not competent', it requires level 2 grading metrics.

Note: Only a limited number of competencies may be observed and graded in this phase (e.g. PRO, FPA, FPM); the others are 'to be left in blank'.

(3) SBT — overall performance of the phase at level 1 grading metrics. Unless just culture and the necessary non-jeopardy environment during training may be compromised. In that case, level 0 grading metrics.

Note: In-seat instruction (ISI) should not be included in any assessment.

(c) Where any competency is graded below the minimum acceptable level of performance (grade 1 on a 5-point scale), an outcome of additional FSTD training is required.

(1) Additional level 2 grading metrics must be recorded.

(2) The flight crew member should not be released to unsupervised line operations until each competency is demonstrated at or above the minimum acceptable level of performance.

(d) Where all competencies are determined at or above the minimum acceptable level of performance (grade 2 on a 5-point scale), the outcome should be COMPETENT. Consistent grading below the average (2 on a 5-point scale) may indicate a need for training to elevate the performance to the average (grade 3 on a 5-point scale). As a minimum, the following conditions apply:

(1) Any competency graded with 2 requires level 2 grading metrics.

(2) Any competency graded with 2 in any simulator session of the 1st module followed by a grade 2 in the same competency in the EVAL of the 2nd module requires individual tailored training in the SBT of the 2nd module. (First example: 1st Module SBT graded with 2, 2nd Module EVAL graded with 2 in the same competency, thus the 2nd SBT should be an individual tailored training on that competency. Second example: 1s module EVAL graded 2, 2nd module EVAL graded 2 on the same competency, thus the 2nd module SBT should be individual tailored training on that competency).

(3) Any competency graded with 2 in three consecutive modules requires individual tailored training. If at the end of the tailored training (3rd SBT) the competency continues being graded with 2, additional FSTD training is required within the next 3 months. For instance, following the example above, the SBT in the 2nd Module was an individual tailored training. In the 3rd Module during the EVAL the same competency is graded with 2 and

individual tailored training is applied. The SBT is graded with 2 again. The pilot may continue line operations but should receive additional FSTD training within the next 3 months.

(4) The operator should not release a flight crew member to unsupervised line operations when more than four competencies (the majority of the competencies — five competencies or above) are graded with 2 in any single simulator session of the module.

(5) Any EVAL graded with 2 in more than three competencies requires individual tailored training in the SBT. If at the end of the module more than three competencies continue being graded with 2, the pilot may continue line operations but should receive additional FSTD training within the next 3 months.

(e) 'Individual tailored training' refers to a simulator session tailored to the pilot's individual training needs, which may require a different programme or syllabus. Normally, it may be done during the SBT and normally there is not an increase of FSTD volume (no extra simulator session). It may require an increased volume of training such as CBT, additional briefings, etc. Any individual tailored training may be substituted by additional FSTD training before the start of the next module.

(f) 'Additional FSTD training' refers to the fact that in addition to the requirements of tailored training, there is an increase of FSTD volume (extra simulator session). It normally happens after individual tailored training.

GM1 ORO.FC.231(d)(1) Evidence-based training

RECOMMENDED CONDUCT OF THE GRADING — ORCA

(a) At the end of the EVAL, after the facilitated de-briefing, the instructor may, as a minimum, record level 1 grading metrics.

(b) The instructor may conduct the simulator session of the EVAL following the principles of a summative assessment and the facilitated de-briefing following the principles of a formative assessment. The MT and SBT simulator sessions may be conducted as a formative assessment.

(c) At the end of each training phase, it is recommended to record level 1 grading metrics unless just culture and the necessary non-jeopardy environment during training may be compromised. In that case, the following alternative may be recommended: level 0 grading metrics for all competencies may be recorded (exceptionally 'not observed' or 'left in blank' may be recorded) and de-identified level 1 grading metrics may be recorded for the data collection and analysis purposes.

GM2 ORO.FC.231(d)(1) Evidence-based training

RECOMMENDED GRADING SYSTEM METHODOLOGY — VENN MODEL

(a) Grades may be determined during each EBT module as follows:

(1) For each assigned grade:

(i) the observed performance should be identified with one or more OBs; and

(ii) the OB(s) should simply link the observed performance to the competency; they are not to be used as a checklist.

(2) At the completion of the EVAL, the grade should be assigned for each competency, based on the overall assessment of the performance during the EVAL.

(3) The underlying philosophy of the individual tailored training and additional FSTD training is the identification of the pilot's individual training needs during the EVAL or EVALs. However, there may be cases in which such an identification may be complemented using other phases or combination of phases along the EBT programme. Nevertheless, when this happens consistently to a large number of pilots, it may indicate a problem of instructor standardisation.

(4) At the completion of the MT, only a limited number of competencies can be graded. The others are to be left in blank. Note: The grade of a competency as 'not observed' is a relevant set of data to be used in the EBT programme (e.g. may be used for instructor concordance assurance programme, programme design, etc.), while 'competency left in blank' is stating the obvious, which is that MT is a skill retention phase and therefore it focuses on only some of the competencies which may provide NO opportunity to observe all the competencies.

(5) At the completion of the module, grades should be assigned for each competency, based on the overall assessment of training during the SBT.

(6) In exceptional occasions, the instructor may have been unable to assess one or two competencies in the EVAL or SBT. A 'not observed' may be graded. The training system performance and concordance assurance system may use these metrics to improve instructors' standardisation and the EBT programme design. When the operator grades the MT alone (instead of grading the MT and EVAL together), a 'not observed' grading may be frequent. It also occurs when the instructor grades each one of the manoeuvres.

(b) The word pictures are standardised according to the VENN model but may be simplified once instructors become familiar with the system.

Word picture VENN model	
Application of procedures (PRO)	
5	The pilot applied procedures in an exemplary manner, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot applied procedures effectively, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot applied procedures adequately, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot applied procedures at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot applied procedures incorrectly, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Communication (COM)	
5	The pilot communicated in an exemplary manner, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot communicated effectively, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot communicated adequately, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot communicated at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot communicated ineffectively, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Flight path management — automation (FPA)	
5	The pilot managed the automation in an exemplary manner, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot managed the automation effectively, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot managed the automation adequately, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot managed the automation at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot managed the automation ineffectively, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Flight path management — manual control (FPM)	
5	The pilot controlled the aircraft in an exemplary manner, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot controlled the aircraft effectively, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot controlled the aircraft adequately, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot controlled the aircraft at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot controlled the aircraft ineffectively, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Application of knowledge (KNO)	
5	The pilot showed exemplary knowledge, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot showed adequate knowledge, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot showed adequate knowledge, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot showed knowledge at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot showed inadequate knowledge, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Leadership & teamwork (LTW)	
5	The pilot led and worked as a team member in an exemplary manner, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot led and worked as a team member effectively, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot led and worked as a team member adequately, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot led and worked as a team member at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot led or worked as a team member ineffectively, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Problem-solving & decision-making (PSD)	
5	The pilot solved problems and made decisions in an exemplary manner, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot solved problems and made decisions effectively, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot solved problems and made decisions adequately, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot solved problems and made decisions at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot solved problems or made decisions ineffectively, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Situation awareness (SAW)	
5	The pilot's situation awareness was exemplary, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot's situation awareness was good, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot's situation awareness was adequate, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot's situation awareness was at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot's situation awareness was inadequate, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

Workload management (WLM)	
5	The pilot managed the workload in an exemplary manner, by always demonstrating almost all of the observable behaviours to a high standard when required, which enhanced safety, effectiveness and efficiency
4	The pilot managed the workload effectively, by regularly demonstrating most of the observable behaviours when required, which resulted in a safe operation
3	The pilot managed the workload adequately, by regularly demonstrating many of the observable behaviours when required, which resulted in a safe operation
2	The pilot managed the workload at the minimum acceptable level, by only occasionally demonstrating some of the observable behaviours when required, but which did not result in an unsafe situation
1	The pilot managed the workload ineffectively, by rarely demonstrating any of the observable behaviours when required, which resulted in an unsafe situation

AMC1 ORO.FC.231(d)(2) Evidence-based training

VERIFICATION OF THE ACCURACY OF THE GRADING SYSTEM

(a) The purpose is to provide data to assess the accuracy of the grading system.

(b) The items defined below are based on Part-FCL Appendix 9. They should be included in the EVAL and MT of the applicable module. The minimum items to be included are: rejected take-off, failure of critical engine between V1 & V2, adherence to departure and arrival, 3D approaches down to a decision height (DH) not less than 60 m (200 ft), engine-out approach & go-around, 2D approach down to the MDH/A, engine-out approach & go-around, engine-out landing.

(c) Instructors should record if the exercises are flown to proficiency using Appendix 9 references (define criteria). Note: Individual pilots' grading and assessment remains according to the EBT grading system and Appendix 10.

(d) This verification should be performed once every 3 years.

GM1 ORO.FC.231(d)(2) Evidence-based training

VERIFICATION OF THE ACCURACY OF THE GRADING SYSTEM

Items that may be included in a verification of the accuracy of the grading system:

Assessment and training topic	*Flight phase for activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Use of checklist prior to starting engines (1.4 AP9)	GND	Use of checklist prior to starting engines, starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies	This element is not required	Intentionally left in blank	Intentionally left in blank								
Before take-off checks (1.6 AP9)	GND		This element is not required	Intentionally left in blank	Intentionally left in blank								
Rejected take-off at a reasonable speed before reaching V1 (2.6 AP9)	TO	Engine failure after the application of take-off thrust and before reaching V1	PRO - demonstrate adequate knowledge of the technique and procedure for accomplishing a rejected take-off after power-plant/system(s) failure/warnings, including related safety factors; - take into account, prior to beginning the take-off, operational factors which could affect the manoeuvre, such as take-off warning inhibit systems or other aeroplane characteristics, runway length, surface conditions, wind, obstructions that could affect take-off performance and could adversely affect safety; - perform all required pre-take-off checks as required by the appropriate checklist items. FPM - align the aeroplane on the runway centreline; - reduce the power smoothly and promptly, if appropriate to the aeroplane, when power-plant failure is recognised. Maintain the aeroplane under control close to the runway centreline; - use spoilers, prop reverse, thrust reverse, wheel brakes, and other drag/braking devices, as appropriate, maintaining positive control in such a manner as to bring the aeroplane to a safe stop. Accomplish the appropriate power-plant failure or other procedures and/or checklists as set forth in the POH or AFM or SOPs.	From initiation of take-off to complete stop (or as applicable to procedure)	x			x					
3.8.1* Adherence to departure and arrival routes and ATC instructions	CLB APP		This element is not required	Intentionally left in blank									

Take-off with engine failure between V1 and V2 (2.5.2 AP9)	TO	Failure of the critical engine from V1 and before reaching V2 in the lowest CAT I visibility conditions	FPM - establish a bank of approximately 5°, if required, or as recommended by the manufacturer, to maintain coordinated flight, and properly trim for that condition; maintain the operating engine within acceptable operating limits; - establish the best engine inoperative airspeed as appropriate to the aircraft and condition of flight; - establish and maintain the recommended flight attitude and configuration for the best performance for all manoeuvring necessary for the phase of flight; - maintain desired altitude within given limits, when a constant altitude is specified and is within the capability of the aeroplane; - maintain the desired airspeed and heading within given limits. PRO - recognise an engine failure or the need to shut down an engine as simulated by the examiner; - complete engine failure vital action checks from memory; - follow the prescribed aeroplane checklist, and verify the procedures for securing the inoperative engine; - demonstrate proper engine restart or shutdown procedures (whatever appropriate) in accordance with approved procedure/checklist or the manufacturer's recommended procedures and pertinent checklist items; and monitor all functions of the operating engine and make necessary adjustments.	The manoeuvre is considered to be complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement.	x			x					
				The manoeuvre is considered to be complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed.	x			x					

3.8.3* 3D operations to DH/A of 200 ft (60 m) or to higher minima if required by the approach procedure	APP	Manually, with one engine simulated inoperative; engine failure has to be simulated during final approach before passing 1 000 ft above aerodrome level until touchdown or through the complete missed approach procedure. or Manually, with one engine simulated inoperative; engine failure has to be simulated during final approach after passing the outer marker (OM) within a distance of not more than 4 NM until touchdown or through the complete missed approach procedure.	PRO - select and comply with the ILS or LPV instrument approach procedure to be performed; - prior to final approach course, maintain declared or assigned altitudes within given limits without descending below applicable minimum altitudes and maintain headings within given limits; - select, tune, identify and confirm the operational status of ground and aircraft navigation equipment to be used for the approach procedure. COM - establish two-way communications with ATC using the proper communications phraseology and techniques, either personally, or, if appropriate, direct co-pilot/safety pilot to do so, as required for the phase of flight or approach segment; - comply in a timely manner with all clearances, instructions, and procedures issued by ATC and advise accordingly if unable to comply. FPA/FPM - establish the appropriate aircraft configuration and airspeed/V-speed considering turbulence, wind shear or other meteorological and operating conditions; - complete the aircraft checklist items appropriate to the phase of flight or approach segment, including engine out approach and landing checklist, as appropriate; - apply necessary adjustment to the published DH and visibility criteria for the aeroplane approach category when required, such as NOTAMs, inoperative aeroplane and ground navigation equipment, inoperative visual aids associated with the landing environment; - on final approach course, allow no more than ½ scale deflection of the localiser and/or glideslope indications; - maintain declared approach airspeeds within given limits; - maintain a stabilised descent to the DH to permit completion of the visual portion of the approach and landing with minimal manoeuvring; and - initiate the missed approach procedure, upon reaching the DH, when the required visual references for the intended runway are not obtained. 3D linear vertical deviations (e.g. RNP APCH (LNAV/VNAV) using BaroVNAV): not more than – 75 ft below the vertical profile at any time, and not more than + 75 ft above the vertical profile at or below 1 000 ft above aerodrome level. 3D (LNAV/VNAV) 'linear' lateral deviations: cross-track error/deviation should normally be limited to ± ½ the RNP value associated with the procedure. Brief deviations from this standard up to a maximum of 1 time the RNP value are allowable.	Intentionally left in blank	Intentionally left in blank

2D operations down to the MDH/A (3.8.4 AP9)	APP	Non-precision approach down to the MDH/A	PRO - select and comply with the PBN, VOR/ LOC/ LOC BC or NDB instrument approach procedure to be performed; - complete the aircraft checklist items appropriate to the phase of flight or approach segment, including engine out approach and landing checklist, as appropriate; - prior to final approach course, maintain declared altitudes in given limits without descending below applicable minimum altitudes, and maintain headings as given; - select, tune, identify, confirm and monitor the operational status of ground and aircraft navigation equipment to be used for the approach procedure. COM - establish two-way communications with ATC using the proper communications phraseology and techniques, either personally, or, if appropriate, direct co-pilot/safety pilot to do so, as required for the phase of flight or approach segment; - comply in a timely manner with all clearances, instructions, and procedures issued by ATC and advise accordingly if unable to comply. FPA/FPM - apply necessary adjustment to the published minimum descent altitude (MDA) and visibility criteria for the aeroplane approach category when required, such as NOTAMs, inoperative aeroplane and ground navigation equipment, inoperative visual aids associated with the landing environment; - on the intermediate and final segments of the final approach course: a. maintain PBN, VOR/ LOC/ LOC BC tracking within ½ scale deflection of the course deviation indicator or within 5 degrees of the desired track in the case of an NDB approach; b. fly the approach in a stabilised manner without descending below the applicable minimum altitudes depicted on the approach chart (+as required/–0 feet); 2D (LNAV) 'linear' lateral deviations: cross-track error/deviation should normally be limited to ± ½ the RNP value associated with the procedure. Brief deviations from this standard up to a maximum of 1 time the RNP value are allowable. c. descend to and accurately maintain the MDA and track to the missed approach point (MAPt) or to the recommended minimum visibility that would permit completion of the visual portion of the approach with a normal rate of descent and minimal manoeuvring; d. maintain declared approach airspeeds (+10/-5 knots); e. initiate the missed approach procedure, if the required visual references for the intended runway are not obtained at the MAPt; f. execute a normal landing from a straight-in or circling approach as required.	Intentionally left in blank	Intentionally left in blank

Engine-out approach & go-around (4.4* AP9)	APP	Manual go-around with the critical engine simulated inoperative after an instrument approach on reaching DH, MDH or MAPt	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation; Detect deviations through instrument scanning; Maintain spare mental capacity during manual aircraft control; Maintain the aircraft within the flight envelope; Apply knowledge of the relationship between aircraft attitude, speed and thrust.	This manoeuvre should be flown from intercept to centreline until acceleration after go-around. The manoeuvre is considered to be complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement (describe generally critical part of manoeuvre)	x			x					
Engine-out landing (5.5 AP9)	LDG	Landing with the critical engine inoperative		Initiation in a stabilised engine-out configuration from not less than 3 NM final approach, until completion of roll-out	x			x					

GM2 ORO.FC.231(d)(2) Evidence-based training

VERIFICATION OF THE ACCURACY OF THE GRADING SYSTEM — FEEDBACK PROCESS

The verification of the accuracy of the grading system provides valuable data for the training system performance and concordance assurance. Therefore, the verification is necessary from a systemic point of view and the intention is not to measure individual pilot against Appendix 9 criteria.

Concordance agreement between instructors may be high; however, the whole community of instructors may be grading too low or too high (accuracy).

The statistical result of the verification against Appendix 9 criteria can provide the operator with a criterion-referenced system to adjust the accuracy of the grading system. The verification does not require an examiner; EBT instructors may provide the necessary data.

Example 1: For the last 36 months, the operator has a rate of 3 % of pilots scoring 1 (assuming the data is statistically relevant). In this example, the rate of 3 % of the pilots scoring 1 is maintained across all the technical competencies. When the operator performs a verification, the rate of failure would have been only 0,5 %. This may indicate that instructors are rating too low in EBT and therefore some of the pilots scoring 1 should have been graded with a score higher than 1. This may be economically negative for the operator. On the other hand, it could be that the operator has decided to implement higher standards.

Example 2: The operator has an EBT programme with a negligible rate of pilots scoring 1 and a 1 % of pilots scoring 2 in two consecutive recurrent modules. The verification of the technical competencies against Appendix 9 criteria provides a rate of 5 % failure. The EBT manager should further investigate the reason behind this mismatch between EBT and Appendix 9 in the technical competencies. There may be factors influencing this mismatch (e.g. statistical issues, the events in the EBT modules are too benign compared to the events in Appendix 9), which may lead to a corrective action (e.g. redesign of the EBT modules). If the difficulty of the EBT scenarios is equivalent to Appendix 9 and the concordance is high between instructors, then the discrepancy in outcomes might be because the community of instructors are grading too high in the technical competencies (they are grading with 2 when they should have graded 1). Further instructor standardisation will be needed to address this.

The implementation of mixed EBT following GM1 ORO.FC.230(a);(b);(f) provides a good opportunity to fine-tune and verify the accuracy of the grading system because an Appendix 9 licence proficiency check is carried out every year. The authority may not allow full EBT unless the accuracy of the grading system is demonstrated.

Further guidance can be found in the EASA EBT manual.

AMC1 ORO.FC.231(e) Evidence-based training

VOLUME AND FSTD QUALIFICATION LEVEL

(a) The EBT programme has been developed to include a notional exemplar of 48 FSTD hours over a 3-year programme for each flight crew member.

(b) Subject to ORO.GEN.120, the operator may reduce the number of FSTD hours provided that an equivalent level of safety is achieved. The programme should not be less than 36 FSTD hours.

(c) Each EBT module should be conducted in an FSTD with a qualification level adequate to complete proficiency checks; therefore, it should be conducted in a full-flight simulator (FFS) level C or D.

AMC1 ORO.FC.231(f) Evidence-based training

EQUIVALENCY OF MALFUNCTIONS — PROCESS

(a) The equivalency of malfunctions process should be undertaken by subject matter experts (SMEs) who hold or have held a type rating on the aeroplane type.

(b) Steps of the equivalency of malfunctions

Step 1: Look at (review) all aircraft system malfunctions provided by the OEM. For example, FCOM for Airbus, or AFM for other manufacturers, does not normally provide an exhaustive list of malfunctions.

Step 2: Determine and retain in a list only malfunctions that place a significant demand on a proficient crew, in isolation from an environmental or operational context.

Step 3: For each retained malfunction, determine the applicable characteristic or characteristics.

Step 4: Develop the EBT FSTD programme to incorporate malfunctions at the frequency specified in the table of assessment and training topics.

(c) Malfunctions included in the equivalency of malfunctions but not included in the EBT FSTD programme require review and appropriate procedural knowledge training, conducted in a less qualified but suitable alternative environment (classroom, flight procedure training device, advance computer-based training, aviation blended learning environment (ABLE), etc.). Further guidance can be found in the EASA EBT manual.

(d) The operator should establish procedures to determine what malfunctions should be included in the FSTD. This may include a different malfunction difficulty between the EVAL and the SBT.

AMC1 ORO.FC.231(f)(3) Evidence-based training

CREW EXPOSURE TO AT LEAST ONE MALFUNCTION FOR EACH CHARACTERISTIC

(a) Unless specified in the OSD, each crew member should be exposed to the characteristics of degraded control and loss of instrumentation in the role of pilot flying.

(b) Notwithstanding point (a), for aircraft types with a limited number of malfunctions in the characteristic of degraded control or loss of instrumentation, the operator may use an alternative means of compliance in accordance with ORO.GEN.120.

GM1 ORO.FC.231(f) Evidence-based training

EQUIVALENCY OF MALFUNCTIONS — SIGNIFICANT DEMAND ON A PROFICIENT CREW

(a) The criteria to determine that a malfunction places a significant demand on a proficient crew are the following:

(1) The procedure includes one or more action items and not only a set of information for crew awareness.

(2) The flight crew's cognitive load (resources required by the mental processes of perception, memory, judgement, and reasoning) significantly increases during or after the application of the associated abnormal or emergency procedure. The cognitive load is considered to be significantly increased when it is well above the cognitive load induced by the application of the normal standard operating procedures.

(3) The flight crew's workload significantly increases during or after the application of the associated abnormal or emergency procedure. The workload is considered to be significantly increased when it is well above the workload induced by the application of the normal standard operating procedures.

(4) The aircraft handling perceived by the pilot when flying in abnormal conditions is different compared to the aircraft handling in normal conditions; e.g. the symmetry of the flight is affected.

(b) The criteria to determine that a malfunction places a significant demand on a proficient crew allow the identification of:

(1) the pilot competencies that are specifically challenged during the management of the related procedure, and

(2) the characteristic of the aircraft system malfunction procedure.

Note: The identification of the pilot competencies allows a consistent assessment to determine the proficiency of the crew member.

Criteria in (a)	Definition	Challenged Competency	Example of procedure characteristics
(1)	The procedure includes one or more action items and not only a set of information for crew awareness.	▪ PRO ▪ KNO	▪ multiple paths within the procedure (e.g. decision trees) ▪ multiple inoperative or degraded systems
(2)	The flight crew's cognitive load (resources required by the mental processes of perception, memory, judgement, and reasoning) significantly increases, during, or after, the application of the abnormal/emergency procedure. The cognitive load is considered to be significantly increased when it is well above the cognitive load induced by	▪ SAW ▪ PSD	▪ multiple paths within the procedure (e.g. decision trees) ▪ multiple inoperative or degraded systems ▪ a high potential for undetected errors (e.g. removal of flight protections)

	the application of the normal standard operating procedures.		
(3)	The flight crew's workload significantly increases, during, or after, the application of the abnormal/emergency procedure. The workload is considered to be significantly increased when it is well above the workload induced by the application of the normal standard operating procedures.	▪ WLM	▪ time criticality; ▪ multiple paths within the procedure (e.g. decision trees); ▪ multiple inoperative or degraded systems; ▪ a high potential for undetected errors (e.g. removal of flight protections); and ▪ a significant increase in workload (e.g. removal of automation).
(4)	The aircraft handling perceived by the pilot when flying in abnormal conditions is different compared to the aircraft handling in normal conditions; e.g. the symmetry of the flight is affected.	▪ FPM ▪ FPA	▪ multiple inoperative or degraded systems ▪ a high potential for undetected errors (e.g. removal of flight protections)

(c) When a malfunction is placing a significant demand on a proficient crew, it means it has one or more of the malfunction characteristics (see more in GM2.ORO.FC.231(f)).

GM2 ORO.FC.231(f) Evidence-based training

EQUIVALENCY OF MALFUNCTIONS — MALFUNCTION CHARACTERISTICS

The following may be considered suitable definitions for each of the characteristics:

(a) 'Immediacy': System malfunctions that require immediate and urgent crew intervention or decision (e.g. malfunctions with memory items, loss of pressurisation at high altitude, brake failure during landing).

(b) 'Complexity': System malfunctions that require recovery procedures with multiple options to analyse and/or multiple decision paths to apply (e.g. multiple hydraulic system failures, smoke and fumes procedures).

(c) 'Degradation of aircraft control': System malfunctions that result in significant degradation of flight controls in combination with abnormal handling characteristics, such as modification of the normal pitch attitude during approach and landing or reconfiguration of the flight control laws or modes (e.g. jammed stabiliser, flaps/slats inoperative)

(d) 'Loss of instrumentation': System malfunctions that require monitoring and management of the flight path using degraded or alternative displays such as temporary or permanent loss of any flight-path-related parameter displayed on the primary flight display (PFD), head-up display (HUD) or navigation display (ND), including loss of any setting capability of one of these indications. It includes primary instrumentation to monitor and manage primary aircraft systems (e.g. FLAPS indication, loss of fuel indications, etc.).

(e) 'Management of consequences': System malfunctions that affect significantly the flight crew standard task sharing and/or the workload management and/or the decision-making process

during an extensive period after the management of the malfunction itself (e.g. fuel leak or fuel not usable, altitude/speed limitations, malfunctions with 'deferred' items in later flight phases).

Note: Equivalency of malfunctions may be undertaken in consultation with the aircraft OEM. The objective of the OEM consultation is to review the operator analysis regarding the OEM operational certification (e.g. OSD) documents and the general OEM operation and training policy.

GM3 ORO.FC.231(f) Evidence-based training

EQUIVALENCY OF MALFUNCTIONS — ISOLATION FROM AN ENVIRONMENTAL OR OPERATIONAL CONTEXT

When considering significant demand on a proficient crew, SMEs may consider that there are no significant environmental and operational threats. For example, the aircraft is close to a suitable aerodrome with environmental conditions permitting all published approaches to be made, with no pre-existing malfunctions and sufficient fuel for several hours (e.g. A320 or B737 overhead Ibiza - Spain, at FL350 with visible moisture at 30 000 ft, at the aerodrome wind calm, CAVOK, ISA).

GM4 ORO.FC.231(f) Evidence-based training

EQUIVALENCY OF MALFUNCTIONS PROCESS — DELPHI

(a) The operator reviews/looks at aircraft system malfunctions provided in the official documentation of the OEM — for example, FCOM for Airbus, or AFM for other manufacturers.

(b) Before launching the equivalency of malfunctions survey and when the aircraft system malfunctions list is very long, the operator may slightly shorten the list by removing the malfunctions that surely will not place a significant demand of a proficient crew (see GM on SIGNIFICANT DEMAND ON A PROFICIENT CREW).

(c) A group of EBT instructors statistically relevant will be selected to perform the equivalency of malfunctions survey. 50 % of the instructors' community will be used as a reference. In small instructors' communities, it may be necessary to refer to 100 %. In operators with large instructors' communities, the number of instructors statistically relevant may be less than 50 %.

(d) The group of instructors selected in point (c) will rate each of the malfunctions listed in points (a) and (b)

(1) Each instructor will rate each one of the 5 characteristics in each malfunction listed in point (b).

(2) The rate will be 0 when the malfunction does not have the characteristic (the characteristic does not appear in the malfunction).

(3) The rate will be 1 to 5 when the characteristic appears in the malfunction. Rating 1 when the characteristic is not relevant for the malfunction and rate 5 when the characteristic is very relevant.

(4) The instructors will rate individually (e.g. home, classroom, etc.) to avoid exchange of opinions with other instructors.

(e) An average rate of the whole instructors' community as a result of point (d) will be calculated for each characteristic of each malfunction.

(f) A second round of survey will be performed with the same instructors and the same list. This time the operator will provide the average calculated in point (e) and ask them if in light of the average they would like to change their rating. Group discussion may substitute or complement the second survey.

(g) When an instructor changes their rating, the old rate will be discarded.

(h) A new average will be calculated for each characteristic of each malfunction at the end of the second survey. The final average will be rounded to the closest integer number.

(i) The operator may select an average rate of the characteristics (e.g. rate 2 or 3) at which or above which the characteristic is considered to be present in the malfunction, thus it places a significant demand on a proficient crew.

(j) The operator may use the rates of the characteristics to determine the difficulty of the malfunction. As SBT is a developing phase, the operator may select a higher difficulty of the malfunctions selected in this phase. Further guidance can be found in the EASA EBT manual.

(k) The operator may refer to an aircraft OEM malfunction analysis to support all the steps of the session.

(l) A simpler version of the process may be acceptable provided that:

(1) the aircraft manufacturer provides equivalency of malfunction documentation;

(2) there is a minimum of three EBT instructors who have a deep knowledge of aircraft systems; and

(3) the instructors referred to in (2) above are properly standardised. The standardisation is based on the EBT programme design knowledge and in particular the concept, definitions and process of the equivalency of malfunctions. The simplified process may or may not use a survey and use either a two-point scale (0 and 1), three-point scale (1, 2 and 3) or five-point scale (1 to 5).

AMC1 ORO.FC.231(g) Evidence-based training

APPROACHES THAT PLACE AN ADDITIONAL DEMAND ON A PROFICIENT CREW

(a) In order to identify approaches that place an additional demand on a proficient crew, an operator should:

(1) review its operational network;

(2) select approaches with one or more of the following characteristics:

(i) unusual design;

(ii) low frequency of exposure; and

(iii) degraded approach guidance;

(3) select at least one approach of each type and method and include them in the EBT programme at the frequency given in the table of assessment and training topics; and

(4) ensure the approaches selected in (3) cover all the characteristics at the frequency given in the table of assessment and training topics.

Note: The approaches listed within Section 2 of the table of assessment and training topics should be selected in this process.

(b) Any approach that is required to be flown in the PF role specifically should be classified as 'skills retention' and may be trained in the MT.

AMC2 ORO.FC.231(g) Evidence-based training

EQUIVALENCY OF APPROACHES RELEVANT TO OPERATIONS — SPECIFIC APPROVAL

The operator may extend the interval for recurrent training and checking of approaches that require specific approval as defined in the AMC to Part-SPA (e.g. SPA.LVO) to the frequency given in the EBT programme.

GM1 ORO.FC.231(g) Evidence-based training

EQUIVALENCY OF APPROACHES RELEVANT TO OPERATIONS — APPROACH CHARACTERISTICS

The following may be considered suitable examples for each of the approach characteristics:

(a) Design

(1) Unusual approach design feature — for example, offset final approach track or steep approach, etc.

(2) Unusual runway design feature — for example, non-standard lighting or marking

(b) Frequency

(1) Infrequently visited airfields — for example, alternate airfields

(2) Infrequently flown approaches at commonly visited airfields — for example, circling approach, CAT 2, SA CATI

(c) Degraded guidance

(1) Degraded internal guidance or aircraft equipment — for example, head-up display (HUD) failure

(2) Degraded external guidance or ground equipment — for example, GPS signal failure

GM2 ORO.FC.231(g) Evidence-based training

SELECTED APPROACHES AT THE FREQUENCY GIVEN IN THE EBT PROGRAMME

The table of assessment and training topics for each generation provides the type of approach, flight method and frequency for the crew.

AMC1 ORO.FC.231(h) Evidence-based training

LINE EVALUATION OF COMPETENCE

(a) The purpose of the line evaluation of competence is to verify the capability of the flight crew member(s) to undertake line operations, including preflight and post-flight activities as specified in the operations manual. Therefore, the line evaluation of competence should be performed in the aircraft. The route should be representative of typical sectors undertaken in normal

operations. The commander, or any pilot who may be required to relieve the commander, should also demonstrate their competency in the role.

(b) Each flight crew member should be assessed according to the competency framework and grading system approved for their operator's EBT programme.

(c) Flight crew members should be assessed in duties as pilot flying and pilot monitoring; they should be evaluated in each role. Therefore, they should be checked on one flight sector as pilot flying and on another flight sector as pilot monitoring.

(d) The operator should maintain a list and inform the competent authority about the line evaluators suitably qualified to undertake line evaluations of competence.

(e) The person that conducts the line evaluation of competence should occupy an observer's seat. For aeroplanes, in the case of long-haul operations where additional operating flight crew members are carried, the person that conducts the line evaluation of competence may fulfil the function of a cruise relief pilot and should not occupy either pilot's seat during take-off, departure, initial cruise, descent, approach and landing.

(f) The validity period should be counted from the end of the month when the line evaluation of competence was undertaken. When the line evaluation of competence is undertaken within the last 3 months of the validity period, the new validity period should be counted from the original expiry date.

AMC2 ORO.FC.231(h) Evidence-based training

LINE EVALUATION OF COMPETENCE — LINE EVALUATOR

(a) The line evaluator should have a valid line evaluation of competence.

(b) The line evaluator should receive an acceptable training based on the EBT instructor training. The EBT assessment of competence is not required.

AMC1 ORO.FC.231(h)(3) Evidence-based training

LINE EVALUATION OF COMPETENCE — EXTENSION OF THE VALIDITY

In order to extend the validity of the line evaluation of competence to:

(a) 2 years, in every cycle, one EVAL for each pilot should be conducted by an EBT instructor (EBT instructors) who has (have) a valid line evaluation of competence in the same operator;

(b) 3 years, in addition to point (a) above, the operator should have a feedback process for the monitoring of line operations which:

(1) identifies threats in the airline's operating environment;

(2) identifies threats within the airline's operations;

(3) assesses the degree of transference of training to the line operations;

(4) checks the quality and usability of procedures;

(5) identifies design problems in the human-machine interface;

(6) understands pilots' shortcuts and workarounds; and

(7) assesses safety margins.

GM1 ORO.FC.231(h) Evidence-based training

LINE EVALUATION OF COMPETENCE

(a) Line evaluation of competence, route and aerodrome knowledge, and recent experience requirements are intended to verify the capability of the flight crew member(s) to operate safely, effectively and efficiently under line operating conditions, including preflight and post-flight activities as specified in the operations manual. Other EBT assessments, legacy checks and emergency and safety equipment training are primarily intended to prepare flight crew members for abnormal/emergency procedures.

(b) The line evaluation of competence is considered a particularly important factor in the development, maintenance and refinement of high operating standards, and can provide the operator with a valuable indication of the usefulness of its training policy and methods.

GM1 ORO.FC.231(h)(4) Evidence-based training

LINE EVALUATOR

(a) AMC1.ORO.FC.146(c) 'EBT instructor training' provides some learning objectives which may be used to qualify the commander nominated by the operator to perform line evaluation of competence. The training may be a minimum of 7 hours, where 1 hour may be done outside the classroom. The use of advance training environments such as advance computer-based training or ABLE may reduce further the need of classroom training. The assessment of competence may not be required. Further guidance can be found in the EASA EBT manual.

(b) The line evaluator training may be included in the EBT instructor standardisation and concordance programme. This option is however limited due to the limited number of line evaluations of competence that are required (every 2 or 3 years), the difficulties in observing the whole range of performance of competencies and the lack of control of the environment during a line evaluation of competence. Therefore, the operator may need to use EBT instructors to maintain an acceptable level of standardisation.

AMC1 ORO.FC.231(i) Evidence-based training

PERFORMANCE-BASED CONTINUOUS TECHNICAL GROUND TRAINING

(a) Technical ground training programme

(1) The objective of the technical ground training programme is to ensure that pilots have adequate:

(i) knowledge of:

(A) the aircraft systems; and

(B) the operational procedures and requirements; and

(ii) awareness of:

(A) the most significant accidents or incidents that could affect their operations following the 'threat and error management model' or an alternative risk model agreed with the authority; and

(B) the occurrences in the airline or occurrences from other airlines that may be relevant for their operations, accident/incident and occurrence review.

(2) The technical ground training should:

(i) be conducted as part of a 3-year programme;

(ii) allow a customisation of syllabi. The operator should describe in the operations manual the procedure to determine the customisation of syllabi. This customisation should be based on evidence both internal and external to the operator.

(iii) as a minimum, allow the pilot to receive technical ground training every 12 months. The validity period should be counted from the end of the month. When this training is conducted within the last 3 months of the validity period, the new validity period should be counted from the original expiry date.

(3) The technical ground training syllabi should be delivered using different methods and tools.

(i) The selection of the method and tool results from a combination of the learning objectives and the target group receiving the training (WHAT needs to be trained and WHO needs to be trained).

(ii) The selection of the appropriate method and tool should be driven by the desired outcome in terms of adequate knowledge.

(iii) The delivery of the technical ground training syllabi should include the methods or tools to verify if the pilot has acquired the objective of the technical ground training programme. This may be achieved by means a questionnaire, assessment of application of the competency 'knowledge' (KNO) or other suitable methods.

(4) The measurement and evaluation of the training system performance through the feedback process should include the performance of the technical ground training.

(b) Emergency and safety equipment training

(1) Training on the location and use of all emergency and safety equipment should be conducted in an aircraft or a suitable alternative training device.

(2) Every year the emergency and safety equipment training programme should include the following:

(i) actual donning of a life jacket, where fitted;

(ii) actual donning of protective breathing equipment, where fitted;

(iii) actual handling of fire extinguishers of the type used;

(iv) instruction on the location and use of all emergency and safety equipment carried on the aircraft;

(v) instruction on the location and use of all types of exits; and

(vi) security procedures.

(3) Every 3 years the programme of training should include the following:

(i) actual operation of all types of exits;

(ii) demonstration of the method used to operate a slide, where fitted;

(iii) actual firefighting using equipment representative of that carried on the aircraft on an actual or simulated fire except that, with Halon extinguishers, an alternative extinguisher may be used;

(iv) the effects of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment;

(v) actual handling of pyrotechnics, real or simulated, where applicable;

(vi) demonstration in the use of the life rafts, where fitted; and

(vii) particularly in the case where no cabin crew is required, first aid appropriate to the aircraft type, the kind of operation and the crew complement.

(4) The successful resolution of aircraft emergencies requires interaction between flight crew and cabin/technical crew and emphasis should be placed on the importance of effective coordination and two-way communication between all crew members in various emergency situations.

(5) Emergency and safety equipment training should include joint practice in aircraft evacuations so that all who are involved are aware of the duties other crew members should perform. When such practice is not possible, combined flight crew and cabin/technical crew training should include joint discussion of emergency scenarios.

(6) Emergency and safety equipment training should, as far as practicable, take place in conjunction with cabin/technical crew undergoing similar training with emphasis on coordinated procedures and two-way communication between the flight crew compartment and the cabin.

(7) The emergency and safety equipment training should include a pilot's assessment of the training received; as a minimum, by means of a questionnaire, or computer-based exercises, or other suitable methods.

(8) When the emergency and safety equipment training is conducted within 3 calendar months prior to the expiry of the 12-calendar-month period, the next emergency and safety equipment training should be completed within 12 calendar months of the original expiry date of the previous training.

(c) Emergency and safety equipment training — extension of period of training

(1) The emergency and safety equipment training programme should establish and maintain at least an equivalent level of proficiency achieved by complying with the provisions of (b). The level of flight crew proficiency in the use of emergency and safety equipment should be demonstrated prior to being granted approval to extend the period of training by the competent authority.

(2) The operator applying for an approval to extend the period of emergency and safety equipment training should provide the competent authority with an implementation plan, including a description of the level of flight crew proficiency to be achieved in the use of emergency and safety equipment. The implementation plan should comprise the following:

(i) A safety case which should:

(A) demonstrate that the required or equivalent level of proficiency in the use of emergency and safety equipment is maintained;

(B) incorporate the programme of implementation, to include controls and validity checks;

(C) minimise risk during all phases of the programme's implementation and operation; and

(D) include oversight, including review and audits.

(ii) The measurement and evaluation of the training system performance through the feedback process should include the performance of the emergency and safety equipment training. The feedback should be used as a tool to validate that the emergency and safety equipment training is correctly implemented; this enables substantiation of the emergency and safety equipment training and ensures that objectives have been met.

(iii) Documentation that details the scope and requirements of the programme, including the following:

(A) the operator's training needs and established operational and training objectives;

(B) a description of the process for designing and obtaining approval for the operator's emergency and safety equipment training programmes. This should include quantified operational and training objectives identified by the operator's internal monitoring programmes. External sources may also be used; and

(C) a description of how the programme will develop a support and feedback process to form a self-correcting training system.

(3) When the emergency and safety equipment training is conducted within 6 calendar months prior to the expiry of the 24-calendar-month period, the next emergency and safety equipment training should be completed within 24 calendar months of the original expiry date of the previous training.

GM1 ORO.FC.231(i) Evidence-based training

PERFORMANCE-BASED CONTINUOUS GROUND TRAINING — INTERNAL AND EXTERNAL EVIDENCE

(a) Operator evidence (inner loop)

(1) Pilot data (individual or group);

(2) Population-based data according to the training metrics determined in the training system performance;

(3) Evidence identified or recognised through the safety management process covered in ORO.GEN.200.

(b) External evidence from the authority and manufacturers (external loop)

(1) Revision of existing rules and regulations, updated versions of the EBT data report, state safety plan;

(2) Training needs derived from updated OSD (if appropriate for ground training), etc.

(c) The evidence drives the selection of the methods and tools.

GM2 ORO.FC.231(i) Evidence-based training

PERFORMANCE-BASED CONTINUOUS GROUND TRAINING — METHODS AND TOOLS

This is a non-exhaustive list of methods and tools to deliver ground training:

— classroom, presentations,

— web-based training,

— self-learning instructions,

— advance CBT such as virtual reality, chatbots, interactive scenario trainers.

AMC1 ORO.FC.232 EBT programme assessment and training topics

ASSESSMENT AND TRAINING TOPICS

Each table of assessment and training topics is specific to the aeroplane generation specified in the title. The component elements in the column headings of the matrix are as follows:

(a) Assessment and training topic. A topic or grouping of topics derived from threats, errors or findings from data analysis, to be considered for assessment and mitigation by training.

(b) Frequency. The priority of the topic to be considered in an EBT programme, according to the evidence derived from a large-scale analysis of operational data, is linked to a recommended frequency. There are three levels of frequency:

(1) A — assessment and training topic to be included with defined scenario elements during every EBT module;

(2) B — assessment and training topic to be included with defined scenario elements during every cycle;

(3) C — assessment and training topic to be included with defined scenario elements at least once in the 3-year period of the EBT programme.

(c) Flight phase for activation. The flight phase for the realisation of the critical threat or error in the assessment and training scenario.

(d) Description (includes type of topic, being threat, error or focus). A description of the training topic.

(e) Desired outcome (includes performance criteria or training outcome). Simple evaluative statements on the desired outcome.

(f) Example scenario elements (guidance material). The example scenario elements address the training topic and detail the threat and/or error that the crew are exposed to.

(g) Competency map. Competencies marked are those considered critical in managing the scenario.

AMC2 ORO.FC.232 EBT programme assessment and training topics

GENERATION 4 (JET) — TABLE OF ASSESSMENT AND TRAINING TOPICS

	Assessment and training topic	*Frequency*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Flight phase activation*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
	Generation 4 Jet — Recurrent assessment and training matrix						*Competency map*								
Section 1 — Skill retention. Manoeuvres training phase (MT)															
MT	Rejected take-off	B	Engine failure after the application of take-off thrust and before reaching V1 (CAT I or above)	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	From initiation of take-off to complete stop (or as applicable to the procedure)	x			x					
MT	Failure of the critical engine between V1 and V2	B	Failure of the critical engine (if applicable) from V1 and before reaching V2 in the lowest CAT I visibility or in LVO meteorological (MET) conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
MT	Failure of one engine on take-off	B	Failure of one engine from V1 and before reaching V2 in the lowest CAT I visibility or in LVO MET conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
			Failure of one engine above V2 (any segment of the TO) in the lowest CAT I visibility or in LVO MET conditions.			The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed.	x		x	x					
MT	Emergency descent	C	Initiation of emergency descent from normal cruise altitude		CRZ	The manoeuvre is complete once the aircraft is stabilised in emergency descent configuration (and profile).	x		x	x					
MT	Engine-out approach & landing	B	With the critical engine (if applicable) failed, normal landing		LDG	Initiation in a stabilised engine-out configuration from not less than 3 NM final approach, until completion of roll-out	x			x					
MT	Engine-out approach & go-around	B	With the critical engine (if applicable) failed, manually flown normal precision approach to DA, followed by a manual go-around — the whole manoeuvre to be flown without visual reference		APP	This manoeuvre should be flown from intercept to centreline until acceleration after go-around. The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement (describe generally the critical part of the manoeuvre).	x			x					
MT	Go-around	A	Go-around, all engines operative		APP	High energy, initiation during the approach at 150 to 300 m (500 to 1 000 ft) below the missed approach level-off altitude	x		x	x					
						Initiation of a go-around from DA followed by visual circuit and landing	x		x	x					
						During flare/rejected landing	x		x	x					
MT	Pilot qualification to operate in either pilot's seat	B	As per ORO.FC.235		APP	Complete the manoeuvres mandated in ORO.FC.235.	Intentionally left in blank.								

			Assessment and training topic	Frequency	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Flight phase activation	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 4 Jet — Recurrent assessment and training matrix									Competency map								
Section 2 — Equivalency of approaches relevant to operations. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)																	
MT		Approach type A or B		B	Approach type A or B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	x		x	x			x		X
MT		Approach type A		B	Approach type A flight method 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	x		x	x			x		X
EVAL or SBT		Approach type A		B	Approach type A flight method 3D or 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	x		x	x			x		X
EVAL or SBT		Approach type B		B	Approach type B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	x		x	x			x		X
Section 3 – Equivalency of approaches under specific approvals and take-off under specific approvals. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)																	
MT		SPA approach(es)		B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL or SBT		SPA approach(es)		B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL, MT or SBT		SPA rejected take-off (RTO)		B	Engine failure after the application of take-off thrust and before reaching V1 (in low-visibility MET conditions, preferably in the lowest approved visibility) Low-visibility RTO is not required under Part SPA but instead in Appendix 9 Section 6. Note: AMC1 SPA.LVO.120 point (f) does not require a low-visibility RTO. RTO is required only in the initial LVO course (point (g)(1)(iii) of AMC1 SPA.LVO.120).	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope.	TO	RTO — can be combined with the assessment and training topic 'surprise' in EVAL or SBT	X			X				

EVAL, MT or SBT	LVTO	B	Notwithstanding AMC1 SPA.LVO120 point (f)(1) AMC1 SPA.LVO.120 requires SPA manoeuvres in the frequency of the OPC, as OPC is substituted in the EBT programme. Thus, the frequency in EBT is determined in every cycle (B). Low-visibility take-off, preferably in the lowest approved visibility.	Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	The manoeuvre is complete at a point when the aircraft is stabilised at normal climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement.	x			x				

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 4 Jet — Recurrent assessment and training matrix							Competency map								
Section 4 — Training topics with frequency (A) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)															
EVAL or SBT	Adverse weather	A	GND	Thunderstorm, heavy rain, turbulence, ice build-up to include de-icing issues, as well as high-temperature conditions. The proper use of anti-ice and de-icing systems should be included generally in appropriate scenarios.	Anticipate adverse weather. Prepare for suspected adverse weather. Recognise adverse weather. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control.	Predictive wind shear warning before take-off, as applicable	x	x				x			
			ALL			Adverse-weather scenario, e.g. thunderstorm activity, precipitation, icing		x			x	x		x	
			TO			Wind shear encounter during take-off, not predictive	x			x			x		X
			TO			Predictive wind shear warning during take-off	x	x				x	x		
			TO			Crosswinds with or without strong gusts on take-off	x			x					
			CRZ			Turbulence that increases to severe turbulence		x			x		x	x	
			CRZ			Wind shear encounter scenario during cruise	x		x			x	x	x	
			APP			Reactive wind shear warning during approach or go-around	x		x	x			x		
			APP			Predictive wind shear warning during approach or go-around	x	x				x	x		
			APP			Thunderstorm encounter during approach or on missed approach	x					x	x		
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
			APP			Non-precision approach in cold-temperature conditions, requiring altitude compensation for temperature, as applicable to the type	x	x					x		
			APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
			APP			In approach, unexpected braking action 'good to medium' reported by the preceding aircraft		x				x	x	x	
			APP			Moderate to severe icing conditions during approach effecting aircraft performance	x	x				x	x		
			APP			Reduced visibility even after acquiring the necessary visual reference during approach, due to rain or fog	x	x				x			
EVAL or SBT	Automation management	A	CLB CRZ DES APP	The purpose of this topic is to encourage and develop effective flight path management through proficient and appropriate use of the flight management system(s), guidance and automation, including transitions between modes, monitoring, mode awareness, vigilance and flexibility needed to change from one mode to another. The means of mitigating errors are included in this topic. The errors are described as mishandled auto flight systems, inappropriate mode selection, mishandled flight management system(s) and inappropriate autopilot usage.	Know how and when to use the flight management system(s), guidance and automation. Demonstrate correct methods for engagement and disengagement of the auto flight system(s). Demonstrate appropriate use of flight guidance, auto thrust and other automation systems. Maintain mode awareness of the auto flight system(s), including engagement and automatic transitions. Revert to different modes when appropriate. Detect deviations from the desired aircraft state (flight path, speed, attitude, thrust, etc.) and take appropriate action. Anticipate mishandled auto flight system. Recognise mishandled auto flight system. Take appropriate action if necessary.	ACAS warning, recovery and subsequent engagement of automation	x		x						
			ALL			FMS tactical programming issues, e.g. step climb, runway changes, late clearances, destination re-programming, executing diversion	x		x						X
			CLB CRZ DES APP			Recoveries from terrain avoidance warning systems (TAWS), management of energy state to restore automated flight	x		x	x					
			CLB CRZ DES APP			Amendments to ATC cleared levels during altitude capture modes to force mode awareness and intervention	x		x				x		
			TO			Late ATC clearance to an altitude below acceleration altitude	x		x				x		
			TO APP			Engine-out special terrain procedures	x		x				x		
			CRZ			Forcing autopilot disconnect followed by re-engagement, recovery from low- or high-speed events in cruise	x		x	x			x		
			CLB			Engine failure during or after initial climb using automation	x		x						
			CRZ			Engine failure in cruise to onset of descent using automation	x		x						
			CRZ			Emergency descent	x		x						X
			DES APP			Managing high-energy descent capturing descent path from above (correlation with unstable approach training)	x		x				x		X
			APP			No ATC clearance received prior to commencement of approach or final descent	x		x				x		

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 4 Jet — Recurrent assessment and training matrix							Competency map								
			APP		Restore correct auto flight state. Identify and manage consequences.	Reactive wind shear and recovery from the consequent high-energy state	x		x				x		
			APP			Automation fail to capture the approach altitude in descent (e.g. last altitude before the FAP). Ideally, the failure occurs when the workload is high (e.g. configuration of the aircraft for final approach).					x	x	x	x	
			APP			Non-precision or infrequently flown approaches using the maximum available level of automation	x		x						X
			APP			Gear malfunction during an approach planned with autoland (including autobrake). Competency FPA may or may not be included depending on the impact of such malfunction on the automation.		x	x			x		x	
			APP			ATC clearances to waypoints beyond the programmed descent point for a coded final descent point during an approach utilising a final descent that is commanded by the flight management system	x		x				x		X
EVAL or SBT	Competencies —non-technical (CRM)	A	APP	This encapsulates the general CRM principles and objectives. It includes communication; leadership and teamwork; problem-solving and decision-making; situation awareness and management of information; and workload management. Emphasis should be placed on the development of leadership, shown by EBT data sources to be a highly effective competency in mitigating risk and improving safety through pilot performance.	Exposure to an event or sequence of events to allow the pilot to build awareness of human factors in aviation and the human limitations. This includes the development of the following competencies: Communication: Demonstrate: — effective use of language; — responsiveness to feedback; and — capability to state the plans and resolve ambiguities. Leadership and teamwork: Use appropriate authority to ensure focus on the task. Support others in completing tasks. Problem-solving and decision-making: Detect deviations from the desired state, evaluate problems, identify the risk, consider alternatives and select the best course of action. Continuously review progress and adjust plans. Situation awareness and management of information: Have an awareness of the aircraft state in its environment; project and anticipate changes. Workload management: Prioritise, delegate and receive assistance to maximise focus on the task. Continuously monitor the flight progress.	GPS failure prior to commencement of approach associated with position drift and a terrain alert					x	x	x		X
			DES			Cabin crew report of water noise below the forward galley indicating a possible toilet pipe leak, with consequent avionics failures					x	x	x		
			CRZ			Smoke removal but combined with a diversion until landing is completed.		x			x	x	x	x	X
			GND			Apron fuel spilling					x	x		x	
			CRZ			Important water leak in an aircraft galley		x			x	x		x	
			ALL			A relevant number of cabin crew are wounded or incapacitated. Additionally, the cabin crew wounded or incapacitated are the most competent (e.g. senior cabin crew member).					x	x		x	
			ALL			Unruly passenger(s)					x			x	
			GND			Passenger oxygen: passenger service unit open and mask falling down					x	x		x	
			ALL			Passenger with medical problems — medical emergency					x			x	
			CRZ			Credible threat reported to the crew. Stowaway or fugitive on board.		x			x		x	x	
			GND			No METAR or TAFOR is available for destination due to industrial action at the destination airport.	x	x			x	x			
			CRZ			Credible bomb threat reported to crew		x			x		x	x	
			CLB DES			Credible bomb threat or pressurisation problem, but no quick landing possible (due to weather, terrain or other reasons)		x			x	x		x	
			APP			Diversion with low remaining fuel or increased fuel flow due to system malfunction	x				x		x	x	
			APP			ACAS warning immediately following a go-around, with a descent manoeuvre required		x			x	x	x	X	

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 4 Jet — Recurrent assessment and training matrix							Competency map								
EVAL or SBT	Compliance	A	ALL	Compliance failure. Consequences of not complying with operating instructions (e.g. SOPs). This is not intended to list example scenario elements, but instructors should ensure that observed non-compliances are taken as learning opportunities throughout the programme. In all modules of the programme, the FSTD should as far as possible be treated like an aircraft, and non-compliances should not be accepted simply for expediency.	Recognise that a compliance failure has occurred. Make a verbal announcement. Take appropriate action if necessary. Restore safe flight path if necessary. Manage consequences.	The following are examples of potential compliance failures and are not intended to be developed as scenarios as part of an EBT module: 1. Requesting flap beyond limit speed 2. Flaps or slats in the wrong position for phase of flight or approach 3. Omitting an action as part of a procedure 4. Failing to initiate or complete a checklist 5. Using the wrong checklist for the situation	Intentionally blank								
EVAL or SBT	Go-around management	A	APP	Any threat or error that can result in circumstances that require a decision to perform a go-around, in addition to the execution of the go-around. Go-around scenarios should be fully developed to encourage effective leadership and teamwork, in addition to problem-solving and decision-making, plus execution using manual aircraft control or the flight management system(s) and automation as applicable. Design should include the element of surprise, and scenario-based go-arounds should not be predictable and anticipated. This topic is completely distinct from the go-around manoeuvre listed in the MT section that is intended only to practise psychomotor skills and a simple application of the procedures.		Adverse-weather scenario leading to a reactive wind shear warning during approach	x	x					x	x	
			APP			Adverse-weather scenario leading to a predictive wind shear warning during approach or go-around	x	x					x	x	
			APP			Adverse-weather scenario, e.g. thunderstorm activity, heavy precipitation or icing forcing decision at or close to DA/MDA	x					x	x	x	
			APP			DA with visual reference in heavy precipitation with doubt about the runway surface braking capability	x					x	x	x	
			APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
			APP			Lost or difficult communications resulting in no approach clearance prior to commencement of approach or final descent	x		x				x		
			APP			Birds: large flocks of birds below DA once visual reference has been established				x		x	x		
			APP			System malfunction, landing gear malfunction during the approach									
EVAL or SBT	Manual aircraft control	A	CLB CRZ DES APP	Controls the flight path through manual control	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the normal flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	Flight with unreliable airspeed, which may or may not be recoverable	x			x			x		X
			CLB CRZ DES APP			Alternate flight control modes according to malfunction characteristics	x			x				x	X
			CLB CRZ DES APP			ACAS RA requires the pilot to descend or ATC calls for immediate descent	x	x		x					
			DES			TAWS warning when deviating from planned descent routing, requiring immediate response	x			x	x				
			TO			Scenario immediately after take-off which requires an immediate and overweight landing			x	x	x	x			
			TO			Adverse wind, crosswinds with or without strong gusts on take-off	x			x					

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 4 Jet — Recurrent assessment and training matrix						Competency map								
EVAL or SBT		TO			Adverse weather, wind shear, wind shear encounter during take-off, with or without reactive warnings	x			x			x		
		TO			Engine failure during initial climb, typically 30-60 m (100-200 ft) (autopilot off)	x	x		x				x	
		CRZ			Wind shear encounter scenario during cruise, significant and rapid change in wind speed or down/updrafts, without wind shear warning	x		x			x	x	x	
		APP			Adverse weather, wind shear, wind shear encounter with or without warning during approach	x		x	x			x		
		APP			Adverse weather, deterioration in visibility or cloud base, or adverse wind, requiring a go-around from visual circling approach, during the visual segment	x	x	x	x		x	x	x	
		APP			Interception of the glide slope from above (correlation with unstable approach training)			x				x	x	
		APP LDG			Adverse wind, crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
		APP LDG			Adverse weather, adverse wind, approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
		APP LDG			Circling approach manually flown at night in minimum in-flight visibility to ensure ground reference, minimum environmental lighting and no glide slope guidance lights	X			X			X	X	
		APP LDG			Runway incursion during approach, which can be triggered by ATC at various altitudes or by visual contact during the landing phase	x			x			x		
		LDG			Adverse wind, visibility, type-specific, special consideration for long-bodied aircraft, landing in minimum visibility for visual reference, with crosswind	x	x		x			x		
		LDG			System malfunction, auto flight failure at DA during a low-visibility approach requiring a go-around flown manually	x		x	x			x		
		APP LDG			Approach planned with autoland, followed by a failure below 1 000 ft requiring a manual go-around and an immediate landing due to fuel shortage	x		x		x		x		
		TO			In-seat instruction: Insufficient engine failure recovery, forcing the pilot monitoring to take over the flight controls		x		x			x	x	
		APP LDG			In-seat instruction: Unstable approach on short final or long landing, forcing the pilot monitoring to take over the flight controls		x		x			x	x	
EVAL or SBT	Monitoring, cross-checking, error management, mismanaged aircraft state	A	ALL	The scenarios should be realistic and relevant, and should be used for the purpose of demonstration and reinforcement of effective monitoring. Modules in the FSTD should be treated like those in an aircraft so that trainees have the opportunity to develop the competency with the practice of the right techniques and attitudes related to these topics through pilot performance, and that instructors have the opportunity to assess and train these topics in a realistic environment. As shown by the EBT data report, these topics are of key importance to improve safety in operations.	Recognise mismanaged aircraft state. Observe the pilot's behaviour: how the pilot is mitigating errors, performing cross-checking, monitoring performance and dealing with a mismanaged aircraft state, in order to ensure that observed deviations, errors and mistakes are taken as learning opportunities throughout the programme. Monitor flight path excursions. Detect errors and threats through proper cross-checking performance.	Deviations from the flight path, in pitch attitude, speed, altitude, bank angle		x					x		
			ALL		In-seat instruction: Simple automation errors (e.g. incorrect mode selection, attempted engagement without the necessary conditions, entering wrong altitude or speed, failure to execute the desired mode) culminating in a need for direct intervention from the pilot monitoring, and where necessary taking control.		x					x		
			APP		In-seat instruction: Unstable approach or speed/path/vertical rate not congruent with the required state for the given flight condition	x	x					x	x	
			LDG		In-seat instruction: Demonstration exercise — recovery from bounced landing, adverse wind, strong gusts during landing phase, resulting in a bounce and necessitating recovery action from the pilot monitoring	x			x			x		

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 4 Jet — Recurrent assessment and training matrix						Competency map								
			In addition, the operator may also use these topics to develop scripted role-playing scenarios in the form of ISI. These scenarios cater for the need to monitor flight path excursions from the instructor pilot (PF), detect errors and make appropriate interventions, either verbally or by taking control as applicable. Demonstration scenarios may also be used. Demonstrated role-play should contain realistic and not gross errors, leading at times to a mismanaged aircraft state, which can also be combined with upset management training.	Make appropriate interventions either verbally or by taking control if applicable. Take appropriate action if necessary. Restore the desired aircraft state. Identify and manage consequences.									
Unstable approach	A	DES APP	Reinforce stabilised approach philosophy and adherence to defined parameters. Encourage go-arounds when crews are outside these parameters. Develop and sustain competencies related to the management of high-energy situations.		ATC or terrain-related environment creating a high-energy descent with the need to capture the optimum profile to complete the approach in a stabilised configuration	x		x				x		
		DES APP			ATC or terrain-related environment creating a high-energy descent leading to unstable conditions and requiring a go-around	x		x				x		
		APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
		APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
		APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			

Section 5 — UPRT training topic with frequency (B). Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)														
EVAL, MT or SBT	Upset prevention training	B	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include upset prevention elements in Table 1 for the recurrent training programme in at least every cycle, such that all the elements are covered over a period not exceeding 3 years. The elements are numbered with letters from A to I in Table 1 of AMC1 ORO.FC.220&230. Each element is made up of several numbered components. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recognising and preventing the development of upset conditions.	Early recognition and prevention of upset conditions. When the differences between LHS and RHS are not significant in the handling of the aircraft, UPRT may be conducted in either seat.	See Table 1 of AMC1 ORO.FC.220&230: Elements and respective components of upset prevention training.	Intentionally blank								
			CRZ			Demonstration of the defined normal flight envelope and any associated changes in flight instruments, flight director systems, and protection systems. This should take the form of an instructor-led exercise to show the crew the points beyond which an upset condition could exist.			X					x	x
			TO APP			Severe wind shear or wake turbulence during take-off or approach			x	x		x	x		
			CRZ			As applicable and relevant to the aircraft type, demonstration at a suitable intermediate level, with turbulence as appropriate; practise steep turns and note the relationship between bank angle, pitch and stalling speed.				X			x		x
			CRZ			At the maximum cruise flight level for the current aircraft weight, turbulence to trigger overspeed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism).	X		x	x			x		
			CRZ			At the maximum cruise flight level for the current aircraft weight, turbulence and significant temperature rise to trigger low-speed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism).			X	x			x		X
			CRZ			High-altitude TCAS RA (where the RA is required to be flown in manual flight)	x			x			x	x	

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 6 — Training topics with frequency (B) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)														
EVAL or SBT — Adverse wind	B	TO	Adverse wind/crosswind. This includes tailwind but not ATC mis-reporting of the actual wind.	Recognise adverse-wind conditions. Observe limitations. Apply the appropriate procedures. Maintain directional control and safe flight path.	Take-off with different crosswind/tailwind/gust conditions						x		x	
		TO			Take-off with unreported tailwind		x			x				
		TO			Crosswinds with or without strong gusts on take-off	x			x					
		APP			Wind exceeding limits on final approach (not reported)	x	x				x	x		
		APP			Wind exceeding limits on final approach (reported) in manual aircraft control	x	x		x		x			
		APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
		APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswind including shifting wind directions				x		x	x		
		APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
		APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
		APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
		APP LDG			Crosswind with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
EVAL or SBT — Aircraft system malfunctions, including operations under MEL	B	ALL	Any internal failure(s) apparent or not apparent to the crew Any item cleared by the MEL but having an impact upon flight operations — for instance, thrust reverser locked. Malfunctions to be considered should have one or more of the following characteristics: — Immediacy — Complexity — Degradation of aircraft control — Loss of primary instrumentation — Management of consequences The operator should vary malfunctions for each characteristic over the EBT cycle. Unless specified otherwise in the operational suitability data, at least one malfunction with each characteristic should be included in every cycle. Combining characteristics should not reduce the number of malfunctions below seven in each cycle. For each crew member, the characteristics of degraded control and loss of instrumentation should be in the role of pilot flying and the others may be in the role of pilot flying or pilot monitoring. For full details, see the malfunction equivalency methodology.	Recognise system malfunction. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences. Apply crew operating procedures where necessary. Respond appropriately to additional system abnormalities associated with MEL dispatch.	(i) System malfunctions that require immediate and urgent crew intervention or decision, e.g. fire, smoke, loss of pressurisation at high altitude, failures during take-off, brake failure during landing. (ii) System malfunctions that require complex procedures, e.g. multiple hydraulic system failures, smoke and fumes procedures, major electrical system failure. (iii) System malfunctions that result in significant degradation of flight controls in combination with abnormal handling characteristics, e.g. jammed flight controls, certain degradation of FBW control, jammed horizontal stabiliser; flaps and/or slats locked; other malfunctions that result in degraded flight controls. (iv) System failures that require monitoring and management of the flight path using degraded or alternative displays, unreliable primary flight path information, unreliable airspeed, e.g. flight with unreliable airspeed (v) System failures that require extensive management of their consequences (independent of operation or environment), e.g. fuel leak.	Intentionally blank								
		TO			MEL items with crew operating procedures applicable during take-off						x			X
		TO			Response to an additional factor that is affected by an MEL item (e.g. system failure, runway state)		x		x		x			X
		GND			Malfunction during preflight preparation and prior to departure	x					x	x		
		CLB			Malfunction after departure	x					x	x		X
		ALL			Malfunctions that require immediate attention (e.g. bleed fault during engine start, hydraulic failure during taxi)	x				x			x	
		CLB CRZ			Fuel leak (management of consequences)	x				x		x		X
		TO			Malfunction on take-off high speed below V1	x				x	x			
		TO			Malfunction on take-off high speed above V1	x					x			
		GND			During taxi to the runway, a spurious brake temperature announcement. The crew had the correct brake temperature moments before the failure.					X	X	X		
		TO			Tyre failure during take-off					x	x		x	
		TO			Malfunction on initial climb	x					x			
		APP			Malfunction on approach	x					x		x	
		APP			Malfunction on go-around	x					x		x	
		LDG			Malfunction during landing	x	x		x		x	x		

	Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Aircraft system management	B		Normal system operation according to defined instructions	This is not considered as a stand-alone topic. It is linked with the topic 'compliance'. Where a system is not managed according to normal or defined procedures, this is determined as a non-compliance.	See 'compliance' topic above. There are no defined scenarios, but the instructor should focus on learning opportunities when system management non-compliances manifest themselves during other scenarios. Underpinning knowledge of systems and their interactions should be developed and challenged, and not merely the application of normal procedures.	Intentionally blank								X
			CRZ APP LDG			Minimum fuel, caused by extended delays, weather, etc. where the crew would need to manage a minimum fuel situation.					X	x	x	x	
	Approach, visibility close to minimum	B	APP	Any situation where visibility becomes a threat	Recognise actual conditions. Observe aircraft and/or procedural limitations. Apply the appropriate procedures if applicable. Maintain directional control and safe flight path.	Approach in poor visibility	x		x	x				x	
			APP			Approach in poor visibility with deteriorations necessitating a decision to perform a go-around	x		x	x					
			LDG			Landing in poor visibility				x		x	x		
	Landing	B	LDG	Pilots should have opportunities to practise landings in demanding situations at the defined frequency. Data indicates that landing problems have their roots in a variety of factors, including inappropriate decision-making, in addition to manual aircraft control skills if difficult environmental conditions exist. The purpose of this item is to ensure that pilots are exposed to this during the programme.	Landing in demanding environmental conditions, with malfunctions as appropriate	This topic should be combined with the adverse-weather topic, aircraft system malfunctions topic or any topic that can provide exposure to a landing in demanding conditions.	Intentionally blank								
	Runway or taxiway condition	B	GND TO LDG	Contamination or surface quality of the runway, taxiway, or tarmac including foreign objects	Recognise hazardous runway condition. Observe limitations. Take appropriate action. Apply the appropriate procedures correctly. Assure aircraft control.	Planned anticipated hazardous conditions with dispatch information provided to facilitate planning and execution of appropriate procedures						x			X
			GND TO LDG			Unanticipated hazardous conditions, e.g. unexpected heavy rain resulting in flooded runway surface		x			x	x			
			TO			Take-off on runway with reduced cleared width due to snow	x			x	x		x		
			TO			Stop/go decision in hazardous conditions					x	x		x	
EVAL or SBT	Surprise	B	TO	The data analysed during the development of the EBT concept indicated substantial difficulties encountered by crews when faced with a threat or error, which was a surprise or an unexpected event. The element of surprise should be distinguished from what is sometimes referred to as the 'startle factor' — the latter being a physiological reaction. Wherever possible,	Exposure to an unexpected event or sequence of events at the defined frequency in order to build resilience.	Rejected take- off	X			X		X			

EVAL or SBT			ALL	consideration should be given towards variations in the types of scenario, times of occurrences and types of occurrence, so that pilots do not become overly familiar with repetitions of the same scenarios. Variations should be the focus of EBT programme design, and not left to the discretion of individual instructors, in order to preserve programme integrity and fairness.		Intentionally blank	Intentionally blank											
EVAL or SBT	Terrain	B	ALL	Alert, warning, or conflict	Anticipate terrain threats. Prepare for terrain threats. Recognise unsafe terrain clearance. Take appropriate action. Apply the appropriate procedures correctly. Maintain aircraft control. Restore safe flight path. Manage consequences.	ATC clearance giving insufficient terrain clearance	x	x			x				X
			ALL			Demonstration of terrain avoidance warning systems (TAWS) (this scenario element may be done in an ISI.)						x	x	x	
			TO CLB			Engine failure where performance is marginal leading to TAWS warning		x		x				x	
			DES APP			ATC provides a wrong QNH		x					x		
			DES			'Virtual mountain' refers to the surprise element of an unexpected warning. Care should be exercised in creating a level of realism, so this can best be achieved by an unusual and unexpected change of route during the descent.						X	x	x	
	Workload, distraction, pressure, stress	B	ALL	This is not considered a topic for specific attention on its own, but more as a reminder to programme developers to ensure that pilots are exposed to immersive training scenarios which expose them to manageable high workload and distractions during the course of the EBT programme, at the defined frequency.	Manage available resources efficiently to prioritise and perform tasks in a timely manner under all circumstances	Intentionally blank	Intentionally blank												

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements		PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 7 — UPRT Upset recovery training topic with frequency (C). Manoeuvres training phase or scenario-based training phase (MT or SBT)																
MT or SBT	Upset recovery	C	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include the recovery exercises in Table 2 of AMC1 ORO.FC.220&230 for the recurrent training programme, such that all the exercises are covered over a period not exceeding 3 years. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recovery from developed upsets. The same principles apply to the exercises of components 2, 3 and 4 where one exercise may satisfy the requirement to cover the whole component. An aeroplane upset is defined as an undesired aeroplane state in flight characterised by unintentional divergences from parameters normally experienced during line operations or training. An aeroplane upset may involve pitch and/or bank angle divergences as well as inappropriate airspeeds for the conditions.	Recognise upset condition. Make timely and appropriate intervention. Take appropriate action. Assure timely and appropriate intervention. (AMC1 ORO.FC.220&230 Table 2 component 1) Assure aircraft control. Maintain or restore a safe flight path. Assess consequential issues. Manage outcomes. Consolidate the summary of aeroplane recovery techniques. (AMC1 ORO.FC.220&230 Table 2 component 5) Note: The operator should assess if the exercises should be practised for the either seat qualification.	The example scenario elements may be done in ISI, as non-ISI or a combination of both. If done in ISI: The instructor should position the aircraft within but close to the edge of the validated training envelope before handing control to the trainee to demonstrate the restoration of normal flight. Careful consideration should be given to flying within the validated training envelope.		Intentionally blank								
						Table 2 of AMC1 ORO.FC.220&230: Exercises for upset recovery training										
						A.	**Recovery from developed upsets**									
			CLB DES			2.	Recovery from stall events in the following configurations: — take-off configuration, — clean configuration low altitude, — clean configuration near maximum operating altitude, and — landing configuration during the approach phase.	x			x			x	x	
			CRZ			3.	Recovery from nose high at various bank angles	x			x			x	x	
			CRZ			4.	Recovery from nose low at various bank angles	x			x			x	x	
			CRZ													
			APP				Demonstration at a normal cruising altitude. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
			CLB DES				Demonstration at an intermediate altitude during early stages of the approach. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
							Recovery from a wake turbulence position with high-bank angle	x		x	x			x		

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 8 — Training topics with frequency (C) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)															
EVAL or SBT	ATC	C	ALL	ATC error. Omission, miscommunication, garbled, poor quality transmission. All these act as distractions to be managed by the crew. The scenarios should be combined, where possible, with others of the same or higher weighting, the principal reason being to create distractions.	Respond to communications appropriately. Recognise, clarify and resolve any ambiguities. Refuse or question unsafe instructions. Use standard phraseology whenever possible.	ATC role-play: the instructor provides scripted instructions, as a distraction to the crew	x	x			x				
			ALL			Controller error, provided by the instructor according to a defined scripted scenario	x	x				x	x		
			ALL			Frequency congestion, with multiple aircraft using the same frequency		x							
			APP			Destination temporarily closed					x	x	x	x	
			CRZ			Rescue and firefighting services (RFFS) level reduction at destination		x			x		x		
			APP			Runway change before the interception of the localiser or similar navigation aid in azimuth			x		x		x	x	
			GND TO			Stray dogs at the opposite threshold runway		x			x		x		
			ALL			Poor quality transmissions		x							
EVAL or SBT	Engine failure	C	TO	Any engine failure or malfunction, which causes loss or degradation of thrust that affects performance. This is distinct from the engine-out manoeuvres described in the MT section above, which are intended only to practise psychomotor skills and reinforce procedures to manage engine failures.	Recognise engine failure. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Engine failure or engine malfunction on take-off low speed	x			x		x		x	
			TO			Engine failure or engine malfunction on take-off high speed below V1	x			x		x		x	
			TO			Engine failure or engine malfunction on take-off above V1	x					x	x	x	
			TO			Engine failure or engine malfunction on initial climb	x					x	x		
			APP			Engine malfunction	x					x		x	
			CRZ			Engine failure in cruise (with autopilot)	x		x				x		
			CRZ			Multiple engine failure in CRZ (volcanic ash, recoverable). Competency FPM may or may not be included depending on the impact on the automation.					x	x	x	x	
			LDG			Engine failure or engine malfunction on landing				x					
EVAL or SBT	Fire and smoke management	C	GND	This includes engine, electric, pneumatic, cargo fire, smoke or fumes.	Recognise fire, smoke or fumes Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Fire in cargo or cabin/cockpit at gate	x	x				x		x	
			GND			Fire during taxi	x	x				x		x	X
			GND			Fire with no cockpit indication	x	x				x		x	X
			TO			Take-off low speed	x			x	x	x			X
			TO			Fire or smoke on take-off high speed below V1	x			x	x	x			
			TO			Fire or smoke on take-off high speed above V1	x				x	x			
			TO			Fire or smoke on initial climb	x				x	x			
			CRZ			Cargo compartment fire or avionics compartment fire						x	x	x	
			APP			Engine fire in approach (extinguishable)		x				x			
			APP			Engine fire in approach (non-extinguishable)		x			x	x			
			CLB CRZ DES			Lithium battery fire in the cockpit or cabin compartment	x	x			x	x		x	
			APP			Flight deck or cabin fire		x			x	x			X
			GND			Any of the example scenario elements above ending in an evacuation		x			x	x		x	
	Loss of communications	C	GND	Lost or difficult communications due to either pilot mis-selection or a failure external to the aircraft. This could be for a few seconds or a total loss.	Recognise loss of communications. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative ways to communicate. Manage consequences.	Loss of communications during ground manoeuvring	x	x							
			TO			Loss of communications after take-off	x					x			X
			APP			Loss of communications during approach phase, including go-around	x	x				x	x		X

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Managing loading, fuel, performance errors	C	ALL	A calculation error by one or more pilots, or someone involved with the process, or the process itself, e.g. incorrect information on the load sheet	Anticipate the potential for errors in load/fuel/performance data. Recognise inconsistencies. Manage/avoid distractions. Make changes to paperwork/aircraft system(s) to eliminate error. Identify and manage consequences.	This can be a demonstrated error, in that the crew may be instructed to deliberately insert incorrect data — for example, to take off from an intersection with full-length performance information. The crew will be asked to intervene when acceleration is sensed to be lower than normal, and this may be part of the operator procedures, especially when operating mixed fleets with considerable variations in MTOM.	x	x						x	
			TO			Wind report with take-off clearance not consistent with prior performance calculation. ATC, cabin crew or other people are pushing crew to take off quickly.	x				x		x	x	
			GND			Environmental change during taxi (e.g. heavy rain) not consistent with prior take-off performance calculation							x	x	
			GND			Fuel ground staff on industrial action. Only limited amount of fuel available, which is below the calculated fuel for the flight.					x	x	x	x	
			GND			Advise crew that there is a change of the load sheet figures during taxi to the runway. The crew may have limited time due to a calculated take-off time (CTOT) — ATC Slot.	x							x	
			GND			Braking action reported 'medium'. The information is transmitted just before take-off. The flight is subject to a CTOT — ATC slot.					x		x	x	
EVAL or SBT	Navigation	C	GND	External NAV failure. Loss of GPS satellite, ANP exceeding RNP, loss of external NAV source(s)	Recognise a NAV degradation. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative NAV guidance. Manage consequences.	External failure or a combination of external failures degrading aircraft navigation performance on ground	x		x			x	x		
			TO CLB APP LDG			External failure or a combination of external failures degrading aircraft navigation performance in flight		x			x	x	x		
			GND			Standard initial departure change during taxi. The flight may be subject to a CTOT — ATC slot.					x		x	x	
			APP			Loss of runway lighting below decision height		x				x	x		
			CRZ			No fly zone: when the crew changes control frequency, the new ATCO informs the crew that they are flying over an unannounced 'no fly zone' that is not included in the NOTAMs. (To trigger such an event, the context may be as follows: an unexpected military conflict in the territory the aircraft is flying over or the crew is forced to re-route in flight and the new route flies over a city that has an important event such the Olympic games, a G20/G7 submit, or the route is flying near a space rocket launch close to the time of the launch, like the Guiana Space Centre, Cape Cañaveral, etc.).					x	x	x		
	Operations- or type-specific	C	ALL	Intentionally blank	Intentionally blank	Intentionally blank	Intentionally blank								
	Operations of special airport approval	C	APP LDG	See equivalency of approaches relevant to operations.	The operator should comply with the national qualification requirements published in the aeronautical information publication (AIP).	Intentionally blank	Intentionally blank								
	Pilot incapacitation	C	TO	Consequences for the non-incapacitated pilot	Recognise incapacitation. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	During take-off	x	x			x	x			X
			APP			During approach	x			x				x	X
	Traffic	C	CLB CRZ DES	Traffic conflict. ACAS RA or TA, or visual observation of conflict, which requires evasive manoeuvring	Anticipate potential loss of separation. Recognise loss of separation. Take appropriate action.	ACAS warning that requires crew intervention		x				x	x	x	

					Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.											
	Wind shear recovery	C	TO	With or without warnings including predictive. A wind shear scenario is ideally combined with an adverse-weather scenario containing other elements.	Anticipate potential for wind shear. Avoid known wind shear or prepare for suspected wind shear. Recognise wind shear encounter. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control. Recognise out of wind shear condition. Maintain or restore a safe flight path. Assess consequential issues and manage outcomes.	Predictive wind shear warning during take-off					x	x			
			TO			Wind shear encounter during take-off	x					x	x			
			TO			Wind shear encounter after rotation							x		x	
			TO			Predictive wind shear after rotation						x	x			
			APP			Predictive wind shear during approach	x					x	x			
			APP			Wind shear encounter during go-around	x					x	x		x	
			APP			Wind shear encounter during approach	x					x	x			

END GEN4 JET

AMC3 ORO.FC.232 EBT programme assessment and training topics

GENERATION 3 (JET) — TABLE OF ASSESSMENT AND TRAINING TOPICS

	Assessment and training topic	*Frequency*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Flight phase activation*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
	Generation 3 Jet — Recurrent assessment and training matrix						*Competency map*								
Section 1 — Skill retention. Manoeuvres training phase (MT)															
MT	Rejected take-off	B	Engine failure after the application of take-off thrust and before reaching V1 (CAT I or above)	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	From initiation of take-off to complete stop (or as applicable to the procedure)	x			x					
	Failure of the critical engine between V1 and V2	A	Failure of the critical engine from V1 and before reaching V2 in the lowest CAT I visibility or in LVO meteorological (MET) conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
	Failure of one engine on take-off	B	Failure of one engine from V1 and before reaching V2 in the lowest CAT I visibility or in LVO MET conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
			Failure of one engine above V2 (any segment of the TO) in the lowest CAT I visibility or in LVO MET conditions.			The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed.	x		x	x					
	Emergency descent	C	Initiation of emergency descent from normal cruise altitude		CRZ	The manoeuvre is complete once the aircraft is stabilised in emergency descent configuration (and profile).	x		x	x					
	Engine-out approach & landing	B	With the critical engine (if applicable) failed, normal landing		LDG	Initiation in a stabilised engine-out configuration from not less than 3 NM final approach, until completion of roll-out	x			x					
	Engine-out approach & go-around	B	With the critical engine (if applicable) failed, manually flown normal precision approach to DA, followed by a manual go-around — the whole manoeuvre to be flown without visual reference		APP	This manoeuvre should be flown from intercept to centreline until acceleration after go-around. The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement (describe generally the critical part of the manoeuvre).	x			x					
	Go-around	A	Go-around, all engines operative		APP	High energy, initiation during the approach at 150 to 300 m (500 to 1 000 ft) below the missed approach level-off altitude	x		x	x					
						Initiation of a go-around from DA followed by visual circuit and landing	x		x	x					
						During flare/rejected landing	x		x	x					
	Pilot qualification to operate in either pilot's seat	B	As per ORO.FC.235		APP	Complete the manoeuvres mandated in ORO.FC.235.	Intentionally left in blank.								

		Assessment and training topic	Frequency	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Flight phase activation	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 3 Jet — Recurrent assessment and training matrix								Competency map								
Section 2 — Equivalency of approaches relevant to operations. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)																
MT		Approach type A or B	B	Approach type A or B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
MT		Approach type A	B	Approach type A flight method 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
EVAL or SBT		Approach type A	B	Approach type A flight method 3D or 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
EVAL or SBT		Approach type B	B	Approach type B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
Section 3 – Equivalency of approaches under specific approvals and take-off under specific approvals. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)																
MT		SPA approach(es)	B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL or SBT		SPA approach(es)	B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL, MT or SBT		SPA Rejected take-off (RTO)	B	Engine failure after the application of take-off thrust and before reaching V1 (in low-visibility MET conditions, preferably in the lowest approved visibility) Low-visibility RTO is not required under Part SPA but instead in Appendix 9 Section 6. Note: AMC1 SPA.LVO.120 point (f) does not require a low-visibility RTO. RTO is required only in the initial LVO course (point (g)(1)(iii) of AMC1 SPA.LVO.120).	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	RTO — can be combined with the assessment and training topic 'surprise' in EVAL or SBT	X			X					
EVAL, MT or SBT		LVTO	B	Notwithstanding AMC1 SPA.LVO120 point (f)(1) AMC1 SPA.LVO.120 requires SPA manoeuvres in the frequency of the OPC, as OPC is substituted in the EBT programme. Thus, the frequency in EBT is determined in every cycle (B).		TO	The manoeuvre is complete at a point when the aircraft is stabilised at normal climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement.	x			x					

			Low visibility take-off, preferably in the lowest approved visibility																

Assessment and training topic	*Frequency*	*Flight phase activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
Generation 3 Jet — Recurrent assessment and training matrix						*Competency map*								
Section 4 — Training topics with frequency (A) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT).														
EVAL or SBT	Adverse weather	A	GND	Thunderstorm, heavy rain, turbulence, ice build-up to include de-icing issues, as well as high-temperature conditions. The proper use of anti-ice and de-icing systems should be included generally in appropriate scenarios.	Anticipate adverse weather. Prepare for suspected adverse weather. Recognise adverse weather. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control.	Predictive wind shear warning before take-off, as applicable	x	x				x			
			ALL			Adverse-weather scenario, e.g. thunderstorm activity, precipitation, icing		x			x	x		x	
			TO			Wind shear encounter during take-off, not predictive	x			x			x		X
			TO			Predictive wind shear warning during take-off	x	x				x	x		
			TO			Crosswinds with or without strong gusts on take-off	x			x					
			CRZ			Turbulence that increases to severe turbulence		x			x		x	x	
			CRZ			Wind shear encounter scenario during cruise	x		x			x	x	x	
			APP			Reactive wind shear warning during approach or go-around	x		x	x			x		
			APP			Predictive wind shear warning during approach or go-around	x	x				x	x		
			APP			Thunderstorm encounter during approach or on missed approach	x					x	x		
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
			APP			Non-precision approach in cold-temperature conditions, requiring altitude compensation for temperature, as applicable to the type	x	x					x		
			APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
			APP			In approach, unexpected braking action 'good to medium' reported by the preceding aircraft		x				x	x	x	
			APP			Moderate to severe icing conditions during approach effecting aircraft performance	x	x				x	x		
			APP			Reduced visibility even after acquiring the necessary visual reference during approach, due to rain or fog	x	x				x			
EVAL or SBT	Automation management	A	CLB CRZ DES APP	The purpose of this topic is to encourage and develop effective flight path management through proficient and appropriate use of the flight management system(s), guidance and automation, including transitions between modes, monitoring, mode awareness, vigilance and flexibility needed to change from one mode to another. The means of mitigating errors are included in this topic. The errors are described as mishandled auto flight systems, inappropriate mode selection, mishandled flight management system(s) and inappropriate autopilot usage.	Know how and when to use the flight management system(s), guidance and automation. Demonstrate correct methods for engagement and disengagement of the auto flight system(s). Demonstrate appropriate use of flight guidance, auto thrust and other automation systems. Maintain mode awareness of the auto flight system(s), including engagement and automatic transitions. Revert to different modes when appropriate. Detect deviations from the desired aircraft state (flight path, speed, attitude, thrust, etc.) and take appropriate action.	ACAS warning, recovery and subsequent engagement of automation	x		x						
			ALL			FMS tactical programming issues, e.g. step climb, runway changes, late clearances, destination re-programming, executing diversion	x		x						X
			CLB CRZ DES APP			Recoveries from TAWS, management of energy state to restore automated flight	x		x	x					
			CLB CRZ DES APP			Amendments to ATC cleared levels during altitude capture modes to force mode awareness and intervention	x		x				x		
			TO			Late ATC clearance to an altitude below acceleration altitude	x		x				x		
			TO APP			Engine-out special terrain procedures	x		x				x		
			CRZ			Forcing autopilot disconnect followed by re-engagement, recovery from low- or high-speed events in cruise	x		x	x			x		

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 3 Jet — Recurrent assessment and training matrix							*Competency map*								
			CLB		Anticipate mishandled auto flight system. Recognise mishandled auto flight system. Take appropriate action if necessary. Restore correct auto flight state. Identify and manage consequences.	Engine failure during or after initial climb using automation	x		x						
			CRZ			Engine failure in cruise to onset of descent using automation	x		x						
			CRZ			Emergency descent	x		x						X
			DES APP			Managing high-energy descent capturing descent path from above (correlation with unstable approach training)	x		x				x		X
			APP			No ATC clearance received prior to commencement of approach or final descent	x		x				x		
			APP			Reactive wind shear and recovery from the consequent high-energy state	x		x				x		
			APP			Automation fail to capture the approach altitude in descent (e.g. last altitude before the FAP). Ideally, the failure occurs when the workload is high (e.g. configuration of the aircraft for final approach).					x	x	x	x	
			APP			Non-precision or infrequently flown approaches using the maximum available level of automation	x		x						X
			APP			Gear malfunction during an approach planned with autoland (including autobrake). Competency FPA may or may not be included depending on the impact of such malfunction on the automation.		x	x			x		x	
			APP			ATC clearances to waypoints beyond the programmed descent point for a coded final descent point during an approach utilising a final descent that is commanded by the flight management system.	x		x				x		X
EVAL or SBT	Competencies — non-technical (CRM)	A	APP	This encapsulates the general CRM principles and objectives. It includes communication; leadership and teamwork; problem-solving and decision-making; situation awareness and management of information; and workload management. Emphasis should be placed on the development of leadership, shown by EBT data sources to be a highly effective competency in mitigating risk and improving safety through pilot performance.	Exposure to an event or sequence of events to allow the pilot to build awareness of human factors in aviation and the human limitations. This includes the development of the following competencies: Communication: Demonstrate: — effective use of language; — responsiveness to feedback; and — capability to state the plans and resolve ambiguities. Leadership and teamwork: Use appropriate authority to ensure focus on the task. Support others in completing tasks. Problem-solving and decision-making: Detect deviations from the desired state, evaluate problems, identify the risk, consider alternatives and select the best course of action. Continuously review progress and adjust plans. Situation awareness and management of information: Have an awareness of the aircraft state in its environment; project and anticipate changes.	GPS failure prior to commencement of approach associated with position drift and a terrain alert					x	x	x		X
			DES			Cabin crew report of water noise below the forward galley indicating a possible toilet pipe leak, with consequent avionics failures					x	x	x		
			CRZ			Smoke removal but combined with a diversion until landing is completed.		x			x	x	x	x	X
			GND			Apron fuel spilling					x	x		x	
			CRZ			Important water leak in an aircraft galley		x			x	x		x	
			ALL			A relevant number of cabin crew are wounded or incapacitated. Additionally, the cabin crew wounded or incapacitated are the most competent (e.g. senior cabin crew member).					x	x		x	
			ALL			Unruly passenger(s)					x			x	
			GND			Passenger oxygen: passenger service unit open and mask falling down					x	x		x	
			ALL			Passenger with medical problems — medical emergency					x			x	
			CRZ			Credible threat reported to the crew. Stowaway or fugitive on board.		x			x		x	x	
			GND			No METAR or TAFOR is available for destination due to industrial action at the destination airport.	x	x			x	x			
			CRZ			Credible bomb threat reported to crew		x			x		x	x	
EVAL or SBT			CLB DES			Credible bomb threat or pressurisation problem, but no quick landing possible (due to weather, terrain or other reasons)		x			x	x		x	
			APP			Diversion with low remaining fuel or increased fuel flow due to system malfunction	x				x		x	x	
			APP			ACAS warning immediately following a go-around, with a descent manoeuvre required		x			x	x	x	X	

	Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 3 Jet — Recurrent assessment and training matrix							Competency map								
					Workload management: Prioritise, delegate and receive assistance to maximise focus on the task. Continuously monitor the flight progress.										
EVAL or SBT	Compliance	A	ALL	Compliance failure. Consequences of not complying with operating instructions (e.g. SOPs). This is not intended to list example scenario elements, but instructors should ensure that observed non-compliances are taken as learning opportunities throughout the programme. In all modules of the programme, the FSTD should as far as possible be treated like an aircraft, and non-compliances should not be accepted simply for expediency.	Recognise that a compliance failure has occurred. Make a verbal announcement. Take appropriate action if necessary. Restore safe flight path if necessary. Manage consequences.	The following are examples of potential compliance failures and are not intended to be developed as scenarios as part of an EBT mod: 5. 1. Requesting flap beyond limit speed 2. Flaps or slats in the wrong position for phase of flight or approach 3. Omitting an action as part of a procedure 4. Failing to initiate or complete a checklist 5. Using the wrong checklist for the situation	Intentionally blank								
EVAL or SBT	Go-around management	A	APP	Any threat or error that can result in circumstances that require a decision to perform a go-around, in addition to the execution of the go-around. Go-around scenarios should be fully developed to encourage effective leadership and teamwork, in addition to problem-solving and decision-making, plus execution using manual aircraft control or the flight management system(s) and automation as applicable. Design should include the element of surprise, and scenario-based go-arounds should not be predictable and anticipated. This topic is completely distinct from the go-around manoeuvre listed in the MT section that is intended only to practise psychomotor skills and a simple application of the procedures.		Adverse-weather scenario leading to a reactive wind shear warning during approach	x	x					x	x	
			APP			Adverse-weather scenario leading to a predictive wind shear warning during approach or go-around	x	x					x	x	
			APP			Adverse-weather scenario, e.g. thunderstorm activity, heavy precipitation or icing forcing decision at or close to DA/MDA	x					x	x	x	
			APP			DA with visual reference in heavy precipitation with doubt about the runway surface braking capability	x					x	x	x	
			APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
			APP			Lost or difficult communications resulting in no approach clearance prior to commencement of approach or final descent	x		x				x		
			APP			Birds: large flocks of birds below DA once visual reference has been established				x		x	x		
			APP			System malfunction, landing gear malfunction during the approach									
EVAL or SBT	Manual aircraft control	A	CLB CRZ DES APP	Controls the flight path through manual control	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control.	Flight with unreliable airspeed, which may or may not be recoverable	x			x			x		X
			CLB CRZ DES APP			Alternate flight control modes according to malfunction characteristics	x			x				x	X

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 3 Jet — Recurrent assessment and training matrix						Competency map								
		CLB CRZ DES APP		Maintain the aircraft within the normal flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	ACAS RA requires the pilot to descend or ATC calls for immediate descent	x	x		x					
		DES			TAWS warning when deviating from planned descent routing, requiring immediate response	x			x	x				
EVAL or SBT		TO			Scenario immediately after take-off which requires an immediate and overweight landing			x	x	x	x			
		TO			Adverse wind, crosswinds with or without strong gusts on take-off	x			x					
		TO			Adverse weather, wind shear, wind shear encounter during take-off, with or without reactive warnings	x			x			x		
		TO			Engine failure during initial climb, typically 30-60 m (100-200 ft) (autopilot off)	x	x		x				x	
		CRZ			Wind shear encounter scenario during cruise, significant and rapid change in wind speed or down/updrafts, without wind shear warning	x		x			x	x	x	
		APP			Adverse weather, wind shear, wind shear encounter with or without warning during approach	x		x	x			x		
		APP			Adverse weather, deterioration in visibility or cloud base, or adverse wind, requiring a go-around from visual circling approach, during the visual segment	x	x	x	x		x	x	x	
		APP			Interception of the glide slope from above (correlation with unstable approach training)			x				x	x	
		APP LDG			Adverse wind, crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
		APP LDG			Adverse weather, adverse wind, approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
		APP LDG			Circling approach manually flown at night in minimum in-flight visibility to ensure ground reference, minimum environmental lighting and no glide slope guidance lights	x			x			x	x	
		APP LDG			Runway incursion during approach, which can be triggered by ATC at various altitudes or by visual contact during the landing phase	x			x			x		
		LDG			Adverse wind, visibility, type-specific, special consideration for long-bodied aircraft, landing in minimum visibility for visual reference, with crosswind	x	x		x			x		
		LDG			System malfunction, auto flight failure at DA during a low-visibility approach requiring a go-around flown manually	x		x	x			x		
		APP LDG			Approach planned autoland, followed by a failure below 1 000 ft requiring a manual go-around and an immediate landing due to fuel shortage	x		x		x		x		
		TO			In-seat instruction: Insufficient engine failure recovery, forcing the pilot monitoring to take over the flight controls		x		x			x	x	
		APP LDG			In-seat instruction: Unstable approach on short final or long landing, forcing the pilot monitoring to take over the flight controls		x		x			x	x	
EVAL or SBT	Monitoring, cross-checking, error management, mismanaged aircraft state	A	ALL	The scenarios should be realistic and relevant, and should be used for the purpose of demonstration and reinforcement of effective monitoring.	Recognise mismanaged aircraft state. Observe the pilot's behaviour: how the pilot is mitigating errors, performing cross-checking, monitoring performance and		x					x		
			ALL		In-seat instruction: Simple automation errors (e.g. incorrect mode selection, attempted engagement without the necessary conditions, entering wrong altitude or speed, failure to execute the desired mode) culminating in a need for direct intervention from the pilot monitoring, and where necessary taking control.		x					x		

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 3 Jet — Recurrent assessment and training matrix						*Competency map*								
		APP	Modules in the FSTD should be treated like those in an aircraft so that trainees have the opportunity to develop the competency with the practice of the right techniques and attitudes related to these topics through pilot performance, and that instructors have the opportunity to assess and train these topics in a realistic environment. As shown by the EBT data report, these topics are of key importance to improve safety in operations. In addition, the operator may also use these topics to develop scripted role-playing scenarios in the form of ISI. These scenarios cater for the need to monitor flight path excursions from the instructor pilot (PF), detect errors and make appropriate interventions, either verbally or by taking control as applicable. Demonstration scenarios may also be used. Demonstrated role-play should contain realistic and not gross errors, leading at times to a mismanaged aircraft state, which can also be combined with upset management training.	dealing with a mismanaged aircraft state, in order to ensure that observed deviations, errors and mistakes are taken as learning opportunities throughout the programme. Monitor flight path excursions. Detect errors and threats through proper cross-checking performance. Make appropriate interventions either verbally or by taking control if applicable. Take appropriate action if necessary. Restore the desired aircraft state. Identify and manage consequences.	In-seat instruction: Unstable approach or speed/path/vertical rate not congruent with the required state for the given flight condition	x	x					x	x	
		LDG			In-seat instruction: Demonstration exercise — recovery from bounced landing, adverse wind, strong gusts during landing phase, resulting in a bounce and necessitating recovery action from the pilot monitoring	x			x			x		
	Unstable approach	A	DES APP	Reinforce stabilised approach philosophy and adherence to defined parameters. Encourage go-arounds when crews are outside these parameters. Develop and sustain competencies related to the management of high-energy situations.		ATC or terrain-related environment creating a high-energy descent with the need to capture the optimum profile to complete the approach in a stabilised configuration	x		x				x		
			DES APP			ATC or terrain-related environment creating a high-energy descent leading to unstable conditions and requiring a go-around	x		x				x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 5 — UPRT training topic with frequency (B). Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)														
EVAL, MT or SBT	Upset prevention training	B	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include upset prevention elements in Table 1 for the recurrent training programme in at least every cycle, such that all the elements are covered over a period not exceeding 3 years. The elements are numbered with letters from A to I in Table 1 of AMC1 ORO.FC.220&230. Each element is made up of several numbered components. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recognising and preventing the development of upset conditions.	Early recognition and prevention of upset conditions. When the differences between LHS and RHS are not significant in the handling of the aircraft, UPRT may be conducted in either seat.	See Table 1 of AMC1 ORO.FC.220&230: Elements and respective components of upset prevention training.	Intentionally blank								
			CRZ			Demonstration of the defined normal flight envelope and any associated changes in flight instruments, flight director systems, and protection systems. This should take the form of an instructor-led exercise to show the crew the points beyond which an upset condition could exist.			x					x	x
			TO APP			Severe wind shear or wake turbulence during take-off or approach			x	x		x	x		
			CRZ			As applicable and relevant to the aircraft type, demonstration at a suitable intermediate level, with turbulence as appropriate; practise steep turns and note the relationship between bank angle, pitch and stalling speed				x			x		x
			CRZ			At the maximum cruise flight level for the current aircraft weight, turbulence to trigger overspeed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism)	x		x	x			x		
			CRZ			At the maximum cruise flight level for the current aircraft weight, turbulence and significant temperature rise to trigger low-speed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism)			x	x			x		X
			CRZ			High-altitude loss of reliable airspeed	x	x		x			x	x	
			CRZ			High-altitude TCAS RA (where the RA is required to be flown in manual flight)	x			x			x	x	

Section 6 — Training topics with frequency (B) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)														
EVAL or SBT	Adverse wind	B	TO	Adverse wind/crosswind. This includes tailwind but not ATC mis-reporting of the actual wind.	Recognise adverse-wind conditions. Observe limitations. Apply the appropriate procedures. Maintain directional control and safe flight path.	Take-off with different crosswind/tailwind/gust conditions					x		x	
			TO			Take-off with unreported tailwind		x			x			
			TO			Crosswinds with or without strong gusts on take-off	x			x					
			APP			Wind exceeding limits on final approach (not reported)	x	x				x	x		
			APP			Wind exceeding limits on final approach (reported) in manual aircraft control	x	x		x		x			
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswind including shifting wind directions				x		x	x		
			APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
			APP LDG			Crosswind with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			

EVAL or SBT	Aircraft system malfunctions, including operations under MEL	B	ALL	Any internal failure(s) apparent or not apparent to the crew Any item cleared by the MEL but having an impact upon flight operations — for instance, thrust reverser locked. Malfunctions to be considered should have one or more of the following characteristics: — Immediacy — Complexity — Degradation of aircraft control — Loss of primary instrumentation — Management of consequences The operator should vary malfunctions for each characteristic over the EBT cycle. Unless specified otherwise in the operational suitability data, at least one malfunction with each characteristic should be included in every cycle. Combining characteristics should not reduce the number of malfunctions below seven for each cycle. For each crew member, the characteristics of degraded control and loss of instrumentation should be in the role of pilot flying and the others may be in the role of pilot flying or pilot monitoring. For full details, see the malfunction equivalency methodology.	Recognise system malfunction. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences. Apply crew operating procedures where necessary. Respond appropriately to additional system abnormalities associated with MEL dispatch.	(i) System malfunctions that require immediate and urgent crew intervention or decision, e.g. fire, smoke, loss of pressurisation at high altitude, failures during take-off, brake failure during landing. (ii) System malfunctions that require complex procedures, e.g. multiple hydraulic system failures, smoke and fumes procedures, major electrical system failure. (iii) System malfunctions that result in significant degradation of flight controls in combination with abnormal handling characteristics, e.g. jammed flight controls, certain degradation of FBW control, jammed horizontal stabiliser; flaps and/or slats locked; other malfunctions that result in degraded flight controls. (iv) System failures that require monitoring and management of the flight path using degraded or alternative displays, unreliable primary flight path information, unreliable airspeed, e.g. flight with unreliable airspeed (v) System failures that require extensive management of their consequences (independent of operation or environment), e.g. fuel leak.	Intentionally blank								
			TO			MEL items with crew operating procedures applicable during take-off						x			X
			TO			Response to an additional factor that is affected by an MEL item (e.g. system failure, runway state)		x		x		x			X
			GND			Malfunction during preflight preparation and prior to departure	x					x	x		
			CLB			Malfunction after departure	x					x	x		X
			ALL			Malfunctions that require immediate attention (e.g. bleed fault during engine start, hydraulic failure during taxi)	x				x			x	
			CLB CRZ			Fuel leak (management of consequences)	x				x		x		X
			TO			Malfunction on take-off high speed below V1	x				x	x			
			TO			Malfunction on take-off high speed above V1	x					x			
			GND			During taxi to the runway, a spurious brake temperature announcement. The crew had the correct brake temperature moments before the failure.					X	X	X		
			TO			Tyre failure during take-off					x	x		x	
			TO			Malfunction on initial climb	x					x			
			APP			Malfunction on approach	x					x		x	
			APP			Malfunction on go-around	x					x		x	
			LDG			Malfunction during landing	x	x		x		x	x		
EVAL or SBT	Aircraft system management	B	N/A	Normal system operation according to defined instructions	This is not considered as a stand-alone topic. It is linked with the topic 'compliance'. Where a system is not managed according to normal or defined procedures, this is determined as a non-compliance.	See 'compliance' topic above. There are no defined scenarios, but the instructor should focus on learning opportunities when system management non-compliances manifest themselves during other scenarios. Underpinning knowledge of systems and their interactions should be developed and challenged, and not merely the application of normal procedures.	Intentionally blank								X
			CRZ APP LDG			Minimum fuel, caused by extended delays, weather, etc. where the crew would need to manage a minimum fuel situation.					x	x	x	x	
	Approach, visibility close to minimum	B	APP	Any situation where visibility becomes a threat	Recognise actual conditions. Observe aircraft and/or procedural limitations. Apply the appropriate procedures if applicable. Maintain directional control and safe flight path.	Approach in poor visibility	x		x	x				x	
			APP			Approach in poor visibility with deteriorations necessitating a decision to perform a go-around	x		x	x					
			LDG			Landing in poor visibility				x		x	x		
	Landing	B	LDG	Pilots should have opportunities to practise landings in demanding situations at the defined frequency. Data indicates that landing problems have their roots in a variety of factors, including inappropriate decision-making, in addition to	Landing in demanding environmental conditions, with malfunctions as appropriate	This topic should be combined with the adverse-weather topic, aircraft system malfunctions topic or any topic that can provide exposure to a landing in demanding conditions.	Intentionally blank								

				manual aircraft control skills if difficult environmental conditions exist. The purpose of this item is to ensure that pilots are exposed to this during the programme.			

Assessment and training topic		*Frequency*	*Flight phase activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
EVAL or SBT	Surprise	B	ALL	The data analysed during the development of the EBT concept indicated substantial difficulties encountered by crews when faced with a threat or error, which was a surprise or an unexpected event. The element of surprise should be distinguished from what is sometimes referred to as the 'startle factor' — the latter being a physiological reaction. Wherever possible, consideration should be given towards variations in the types of scenario, times of occurrences and types of occurrence, so that pilots do not become overly familiar with repetitions of the same scenarios. Variations should be the focus of EBT programme design, and not left to the discretion of individual instructors, in order to preserve programme integrity and fairness.	Exposure to an unexpected event or sequence of events at the defined frequency in order to build resilience.	Rejected take-off	X			X		X			
						Intentionally blank	Intentionally blank								
EVAL or SBT	Wind shear recovery	B	TO	With or without warnings including predictive. A wind shear scenario is ideally combined with an adverse-weather scenario containing other elements.	Anticipate potential for wind shear. Avoid known wind shear or prepare for suspected wind shear. Recognise wind shear encounter. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control. Recognise out of wind shear condition. Maintain or restore a safe flight path. Assess consequential issues and manage outcomes.	Predictive wind shear warning during take-off						x	x			
			TO			Wind shear encounter during take-off	x					x	x			
			TO			Wind shear encounter after rotation							x		x	
			TO			Predictive wind shear after rotation						x	x			
			APP			Predictive wind shear during approach	x					x	x			
			APP			Wind shear encounter during go-around	x					x	x		x	
			APP			Wind shear encounter during approach	x					x	x			

EVAL or SBT	Workload, distraction, pressure, stress	B	ALL	This is not considered a topic for specific attention on its own, but more as a reminder to programme developers to ensure that pilots are exposed to immersive training scenarios which expose them to manageable high workload and distractions during the course of the EBT programme, at the defined frequency.	Manage available resources efficiently to prioritise and perform tasks in a timely manner under all circumstances	Intentionally blank	Intentionally blank	

Assessment and training topic	*Frequency*	*Flight phase activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
Section 7 — UPRT Upset recovery training topic with frequency (C). Manoeuvres training phase or scenario-based training phase (MT or SBT)														
MT or SBT	C	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include the recovery exercises in Table 2 of AMC1 ORO.FC.220&230 for the recurrent training programme, such that all the exercises are covered over a period not exceeding 3 years. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recovery from developed upsets. The same principles apply to the exercises of components 2, 3 and 4 where one exercise may satisfy the requirement to cover the whole component. An aeroplane upset is defined as an undesired aeroplane state in flight characterised by unintentional divergences from parameters normally experienced during line operations or training. An aeroplane upset may involve pitch and/or bank angle divergences as well as inappropriate airspeeds for the conditions.	Recognise upset condition. Make timely and appropriate intervention. Take appropriate action. Assure timely and appropriate intervention. (AMC1 ORO.FC.220&230 Table 2 component 1) Assure aircraft control. Maintain or restore a safe flight path. Assess consequential issues. Manage outcomes. Consolidate the summary of aeroplane recovery techniques. (AMC1 ORO.FC.220&230 Table 2 component 5) Note: The operator should assess if the exercises should be practised for the either seat qualification.	The example scenario elements may be done in ISI, as non-ISI or a combination of both. If done in ISI: The instructor should position the aircraft within but close to the edge of the validated training envelope before handing control to the trainee to demonstrate the restoration of normal flight. Careful consideration should be given to flying within the validated training envelope.	Intentionally blank								
		CLB DES			Table2 of AMC1 ORO.FC.220&230: Exercises for upset recovery training									
					A. **Recovery from developed upsets**									
					2. Recovery from stall events in the following configurations: — take-off configuration, — clean configuration low altitude, — clean configuration near maximum operating altitude, and — landing configuration during the approach phase.	x			x			x	x	
		CRZ			3. Recovery from nose high at various bank angles	x			x			x	x	
		CRZ			4. Recovery from nose low at various bank angles	x			x			x	x	
		CRZ												
		APP			Demonstration at a normal cruising altitude. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
		CLB DES			Demonstration at an intermediate altitude during early stages of the approach. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
					Recovery from a wake turbulence position with high-bank angle	x		x	x			x		

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 8 — Training topics with frequency (C) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)															
EVAL or SBT	ATC	C	ALL	ATC error. Omission, miscommunication, garbled, poor quality transmission. All these act as distractions to be managed by the crew. The scenarios should be combined, where possible, with others of the same or higher weighting, the principal reason being to create distractions.	Respond to communications appropriately. Recognise, clarify and resolve any ambiguities. Refuse or question unsafe instructions. Use standard phraseology whenever possible.	ATC role-play: the instructor provides scripted instructions, as a distraction to the crew	x	x			x				
			ALL			Controller error, provided by the instructor according to a defined scripted scenario	x	x				x	x		
			ALL			Frequency congestion, with multiple aircraft using the same frequency		x							
			APP			Destination temporarily closed					x	x	x	x	
			CRZ			Rescue and firefighting services (RFFS) level reduction at destination		x			x		x		
			APP			Runway change before the interception of the localiser or similar navigation aid in azimuth			x		x		x	x	
			GND/ TO			Stray dogs at the opposite threshold runway		x			x		x		
			ALL			Poor quality transmissions		x							
EVAL or SBT	Engine failure	C	TO	Any engine failure or malfunction, which causes loss or degradation of thrust that affects performance. This is distinct from the engine-out manoeuvres described in the MT section above, which are intended only to practise psychomotor skills and reinforce procedures to manage engine failures.	Recognise engine failure. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Engine failure or engine malfunction on take-off low speed	x			x		x		x	
			TO			Engine failure or engine malfunction on take-off high speed below V1	x			x		x		x	
			TO			Engine failure or engine malfunction on take-off above V1	x					x	x	x	
			TO			Engine failure or engine malfunction on initial climb	x					x	x		
			APP			Engine malfunction	x					x		x	
			CRZ			Engine failure in cruise (with autopilot)	x		x				x		
			CRZ			Multiple engine failure in CRZ (volcanic ash, recoverable). Competency FPM may or may not be included depending on the impact on the automation.					x	x	x	x	
			LDG			Engine failure or engine malfunction on landing				x					
EVAL or SBT	Fire and smoke management	C	GND	This includes engine, electric, pneumatic, cargo fire, smoke or fumes.	Recognise fire, smoke or fumes. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Fire in cargo or cabin/cockpit at gate	x	x				x		x	
			GND			Fire during taxi	x	x				x		x	X
			GND			Fire with no cockpit indication	x	x				x		x	X
			TO			Take-off low speed	x			x	x	x			X
			TO			Fire or smoke on take-off high speed below V1	x			x	x	x			
			TO			Fire or smoke on take-off high speed above V1	x				x	x			
			TO			Fire or smoke on Initial climb	x				x	x			
			CRZ			Cargo compartment fire or avionics compartment fire.						x	x	x	
			APP			Engine fire in approach (extinguishable)		x				x			
			APP			Engine fire in approach (non-extinguishable)		x			x	x			
			CLB CRZ DES			Lithium battery fire in the cockpit or cabin compartment	x	x			x	x		x	
			APP			Flight deck or cabin fire		x			x	x			X
			GND			Any of the example scenario elements above ending in an evacuation		x			x	x		x	
EVAL or SBT	Loss of communications	C	GND	Lost or difficult communications due to either pilot mis-selection or a failure external to the aircraft. This could be for a few seconds or a total loss.	Recognise loss of communications. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative ways to communicate. Manage consequences.	Loss of communications during ground manoeuvring	x	x							
			TO			Loss of communications after take-off	x					x			X
			APP			Loss of communications during approach phase, including go-around	x	x				x	x		X

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Managing loading, fuel, performance errors	C	ALL	A calculation error by one or more pilots, or someone involved with the process, or the process itself, e.g. incorrect information on the load sheet	Anticipate the potential for errors in load/fuel/performance data. Recognise inconsistencies. Manage/avoid distractions. Make changes to paperwork/aircraft system(s) to eliminate error. Identify and manage consequences.	This can be a demonstrated error, in that the crew may be instructed to deliberately insert incorrect data — for example, to take off from an intersection with full-length performance information. The crew will be asked to intervene when acceleration is sensed to be lower than normal, and this may be part of the operator procedures, especially when operating mixed fleets with considerable variations in MTOM.	x	x						x	
			TO			Wind report with take-off clearance not consistent with prior performance calculation. ATC, cabin crew or other people are pushing crew to take off quickly.	x				x		x	x	
			GND			Environmental change during taxi (e.g. heavy rain) not consistent with prior take-off performance calculation							x	x	
			GND			Fuel ground staff on industrial action. Only limited amount of fuel available, which is below the calculated fuel for the flight					x	x	x	x	
			GND			Advise crew that there is a change of the load sheet figures during taxi to the runway. The crew may have limited time due to a calculated take-off time (CTOT) — ATC slot.	x							x	
			GND			Braking action reported 'medium'. The information is transmitted just before take-off. The flight is subject to a CTOT — ATC slot.					x		x	x	
EVAL or SBT	Navigation	C	GND	External NAV failure. Loss of GPS satellite, ANP exceeding RNP, loss of external NAV source(s)	Recognise a NAV degradation. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative NAV guidance. Manage consequences.	External failure or a combination of external failures degrading aircraft navigation performance on ground	x		x			x	x		
			TO CLB APP LDG			External failure or a combination of external failures degrading aircraft navigation performance in flight		x			x	x	x		
			GND			Standard initial departure change during taxi. The flight may be subject to a CTOT — ATC slot.					x		x	x	
			APP			Loss of runway lighting below decision height		x				x	x		
			CRZ			No fly zone: when the crew changes control frequency, the new ATCO informs the crew that they are flying over an unannounced 'no fly zone' that is not included in the NOTAMs. (To trigger such an event, the context may be as follows: an unexpected military conflict in the territory the aircraft is flying over or the crew is forced to re-route in flight and the new route flies over a city that has an important event such the Olympic games, a G20/G7 submit, or the route is flying near a space rocket launch close to the time of the launch, like the Guiana Space Centre, Cape Cañaveral, etc.).					x	x	x		
	Operations- or type-specific	C	ALL	Intentionally blank	Intentionally blank	Intentionally blank	Intentionally blank								
	Operations of special airport approval	C	APP LDG	See equivalency of approaches relevant to operations.	The operator should comply with the national qualification requirements published in the AIP.	Intentionally blank	Intentionally blank								
EVAL or SBT	Pilot incapacitation	C	TO	Consequences for the non-incapacitated pilot	Recognise incapacitation. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	During take-off	x	x			x	x			X
			APP			During approach	x			x				x	X

	Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Runway or taxiway condition	C	GND TO LDG	Contamination or surface quality of the runway, taxiway, or tarmac including foreign objects	Recognise hazardous runway condition. Observe limitations. Take appropriate action. Apply the appropriate procedures correctly. Assure aircraft control.	Planned anticipated hazardous conditions with dispatch information provided to facilitate planning and execution of appropriate procedures						x			X
			GND TO LDG			Unanticipated hazardous conditions, e.g. unexpected heavy rain resulting in flooded runway surface		x			x	x			
			TO			Take-off on runway with reduced cleared width due to snow	x			x	x		x		
			TO			Stop/go decision in hazardous conditions					x	x		x	
	Terrain	C	ALL	Alert, warning, or conflict	Anticipate terrain threats. Prepare for terrain threats. Recognise unsafe terrain clearance. Take appropriate action. Apply the appropriate procedures correctly. Maintain aircraft control. Restore safe flight path. Manage consequences.	ATC clearance giving insufficient terrain clearance	x	x			x				X
			ALL			Demonstration of terrain avoidance warning systems (TAWS) (this scenario element may be done in an ISI.)						x	x	x	
			TO CLB			Engine failure where performance is marginal leading to TAWS warning		x		x				x	
			DES APP			ATC provides a wrong QNH		x					x		
			DES			'Virtual mountain' refers to the surprise element of an unexpected warning. Care should be exercised in creating a level of realism, so this can best be achieved by an unusual and unexpected change of route during the descent.						x	x	x	
	Traffic	C	CLB CRZ DES	Traffic conflict. ACAS RA or TA, or visual observation of conflict, which requires evasive manoeuvring	Anticipate potential loss of separation. Recognise loss of separation. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	ACAS warning that requires crew intervention		x				x	x	x	

END GEN3 JET

AMC4 ORO.FC.232 EBT programme assessment and training topics

GENERATION 3 (TURBOPROP) — TABLE OF ASSESSMENT AND TRAINING TOPICS

	Assessment and training topic	*Frequency*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Flight phase activation*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
Generation 3 Turboprop — Recurrent assessment and training matrix							*Competency map*								
Section 1 — Skill retention. Manoeuvres training phase (MT)															
MT	Rejected take-off	A	Engine failure after the application of take-off thrust and before reaching V1 (may be in LVOs or CAT I or above)	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	From initiation of take-off to complete stop (or as applicable to the procedure)	x			x					
	Failure of the critical engine between V1 and V2	A	Failure of the critical engine from V1 and before reaching V2 in the lowest CAT I visibility or in LVO meteorological (MET) conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
	Failure of one engine on take-off	B	Failure of one engine from V1 and before reaching V2 in the lowest CAT I visibility or in LVO MET conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
			Failure of one engine above V2 (any segment of the TO) in the lowest CAT I visibility or in LVO MET conditions.			The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed.	x		x	x					
	Emergency descent	C	Initiation of emergency descent from normal cruise altitude		CRZ	The manoeuvre is complete once the aircraft is stabilised in emergency descent configuration (and profile).	x		x	x					
	Engine-out approach & landing	A	With the critical engine (if applicable) failed, normal landing		LDG	Initiation in a stabilised engine-out configuration from not less than 3 NM final approach, until completion of roll-out	x			x					
	Engine-out approach & go-around	A	With the critical engine (if applicable) failed, manually flown normal precision approach to DA, followed by a manual go-around — the whole manoeuvre to be flown without visual reference		APP	This manoeuvre should be flown from intercept to centreline until acceleration after go-around. The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement (describe generally the critical part of the manoeuvre).	x			x					
	Go-around	A	Go-around, all engines operative		APP	High energy, initiation during the approach at 150 to 300 m (500 to 1 000 ft) below the missed approach level-off altitude	x		x	x					
						Initiation of a go-around from DA followed by visual circuit and landing	x		x	x					
						During flare/rejected landing	x		x	x					
	Pilot qualification to operate in either pilot's seat	B	As per ORO.FC.235		APP	Complete the manoeuvres mandated in ORO.FC.235.	Intentionally left in blank.								

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Generation 3 Turboprop — Recurrent assessment and training matrix							Competency map								
Section 2 — Equivalency of approaches relevant to operations. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)															
MT	Approach type A or B	B	Approach type A or B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
MT	Approach type A	B	Approach type A flight method 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
EVAL or SBT	Approach type A	B	Approach type A flight method 3D or 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
EVAL or SBT	Approach type B	B	Approach type B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
Section 3 — Equivalency of approaches under specific approvals and Take-off under specific approvals. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)															
MT	SPA approach(es)	B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL or SBT	SPA approach(es)	B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL, MT or SBT	SPA rejected take-off (RTO)	B	Engine failure after the application of take-off thrust and before reaching V1 (in low-visibility MET conditions, preferably in the lowest approved visibility) Low-visibility RTO is not required under Part SPA but instead in Appendix 9 Section 6. Note: AMC1 SPA.LVO.120 point (f) does not require a low-visibility RTO. RTO is required only in the initial LVO course (point (g)(1)(iii) of AMC1 SPA.LVO.120).	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	RTO — can be combined with the assessment and training topic 'surprise' in EVAL or SBT	X			X					
VAL, MT or SBT	LVTO	B	Notwithstanding AMC1 SPA.LVO120 point (f)(1) AMC1 SPA.LVO.120 requires SPA manoeuvres in the frequency of the OPC, as OPC is substituted in the EBT programme. Thus, the frequency in EBT is determined in every cycle (B).		TO	The manoeuvre is complete at a point when the aircraft is stabilised at normal climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement.	x			x					

			Low-visibility take-off, preferably in the lowest approved visibility																

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Generation 3 Turboprop — Recurrent assessment and training matrix						*Competency map*								
Section 4 — Training topics with frequency (A) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)														
EVAL or SBT	Adverse weather	A	GND	Thunderstorm, heavy rain, turbulence, ice build-up to include de-icing issues, as well as high-temperature conditions. The proper use of anti-ice and de-icing systems should be included generally in appropriate scenarios.	Anticipate adverse weather. Prepare for suspected adverse weather. Recognise adverse weather. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control.	Predictive wind shear warning before take-off, as applicable	x	x				x			
			ALL			Adverse-weather scenario, e.g. thunderstorm activity, precipitation, icing		x			x	x		x	
			TO			Wind shear encounter during take-off, not predictive	x			x			x		X
			TO			Predictive wind shear warning during take-off	x	x				x	x		
			TO			Crosswinds with or without strong gusts on take-off	x			x					
			CRZ			Turbulence that increases to severe turbulence		x			x		x	x	
			CRZ			Wind shear encounter scenario during cruise	x		x			x	x	x	
			APP			Reactive wind shear warning during approach or go-around	x		x	x			x		
			APP			Predictive wind shear warning during approach or go-around	x	x				x	x		
			APP			Thunderstorm encounter during approach or on missed approach	x					x	x		
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
			APP			Non-precision approach in cold-temperature conditions, requiring altitude compensation for temperature, as applicable to the type	x	x					x		
			APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
			APP			In approach, unexpected braking action 'good to medium' reported by the preceding aircraft		x				x	x	x	
			APP			Moderate to severe icing conditions during approach effecting aircraft performance	x	x				x	x		
			APP			Reduced visibility even after acquiring the necessary visual reference during approach, due to rain or fog	x	x				x			
EVAL or SBT	Automation management	A	CLB CRZ DES APP	The purpose of this topic is to encourage and develop effective flight path management through proficient and appropriate use of the flight management system(s), guidance and automation, including transitions between modes, monitoring, mode awareness, vigilance and flexibility needed to change from one mode to another. The means of mitigating errors are included in this topic. The errors are described as mishandled auto flight systems, inappropriate mode	Know how and when to use the flight management system(s), guidance and automation. Demonstrate correct methods for engagement and disengagement of the auto flight system(s). Demonstrate appropriate use of flight guidance, auto thrust and other automation systems. Maintain mode awareness of the auto flight system(s), including engagement and automatic transitions.	ACAS warning, recovery and subsequent engagement of automation	x		x						
			ALL			FMS tactical programming issues, e.g. step climb, runway changes, late clearances, destination re-programming, executing diversion	x		x						X
			CLB CRZ DES APP			Recoveries from TAWS, management of energy state to restore automated flight	x		x	x					
			CLB CRZ DES APP			Amendments to ATC cleared levels during altitude capture modes to force mode awareness and intervention	x		x				x		

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Generation 3 Turboprop — Recurrent assessment and training matrix						Competency map								
		TO	selection, mishandled flight management system(s) and inappropriate autopilot usage.	Revert to different modes when appropriate. Detect deviations from the desired aircraft state (flight path, speed, attitude, thrust, etc.) and take appropriate action. Anticipate mishandled auto flight system. Recognise mishandled auto flight system. Take appropriate action if necessary. Restore correct auto flight state. Identify and manage consequences.	Late ATC clearance to an altitude below acceleration altitude	x		x				x		
		TO APP			Engine-out special terrain procedures	x		x				x		
		CRZ			Forcing autopilot disconnect followed by re-engagement, recovery from low- or high-speed events in cruise	x		x	x			x		
		CLB			Engine failure during or after initial climb using automation	x		x						
		CRZ			Engine failure in cruise to onset of descent using automation	x		x						
		CRZ			Emergency descent	x		x						X
		DES APP			Managing high-energy descent capturing descent path from above (correlation with unstable approach training)	x		x				x		X
		APP			No ATC clearance received prior to commencement of approach or final descent	x		x				x		
		APP			Reactive wind shear and recovery from the consequent high-energy state	x		x				x		
		APP			Automation fail to capture the approach altitude in descent (e.g. last altitude before the FAP). Ideally, the failure occurs when the workload is high (e.g. configuration of the aircraft for final approach).					x	x	x	x	
		APP			Non-precision or infrequently flown approaches using the maximum available level of automation	x		x						X
		APP			Gear malfunction during an approach planned with autoland (including autobrake). Competency FPA may or may not be included depending on the impact of such malfunction on the automation.		x				x		x	
		APP			ATC clearances to waypoints beyond the programmed descent point for a coded final descent point during an approach utilising a final descent that is commanded by the flight management system	x		x				x		X
EVAL or SBT	Competencies — non-technical (CRM)	A	This encapsulates the general CRM principles and objectives. It includes communication; leadership and teamwork; problem-solving and decision-making; situation awareness and management of information; and workload management. Emphasis should be placed on the development of leadership, shown by EBT data sources to be a highly effective competency in mitigating risk and improving safety through pilot performance.	Exposure to an event or sequence of events to allow the pilot to build awareness of human factors in aviation and the human limitations. This includes the development of the following competencies: Communication: Demonstrate: — effective use of language; — responsiveness to feedback; and — capability to state the plans and resolve ambiguities. Leadership and teamwork: Use appropriate authority to ensure focus on the task. Support others in completing tasks. Problem-solving and decision-making: Detect deviations from the desired state, evaluate problems, identify the risk, consider alternatives and select the best course of action. Continuously review progress and adjust plans.	GPS failure prior to commencement of approach associated with position drift and a terrain alert					x	x	x		X
		DES			Cabin crew report of water noise below the forward galley indicating a possible toilet pipe leak, with consequent avionics failures					x	x	x		
		CRZ			Smoke removal but combined with a diversion until landing is completed.		x			x	x	x	x	X
		GND			Apron fuel spilling					x	x		x	
		CRZ			Important water leak in an aircraft galley		x			x	x		x	
		ALL			A relevant number of cabin crew are wounded or incapacitated. Additionally, the cabin crew wounded or incapacitated are the most competent (e.g. senior cabin crew member).					x	x		x	
		ALL			Unruly passenger(s)					x			x	
		GND			Passenger oxygen: passenger service unit open and mask falling down					x	x		x	
		ALL			Passenger with medical problems — medical emergency					x			x	
		CRZ			Credible threat reported to the crew. Stowaway or fugitive on board.		x			x		x	x	
		GND			No METAR or TAFOR is available for destination due to industrial action at the destination airport	x	x			x	x			
		CRZ			Credible bomb threat reported to crew		x			x		x	x	
		CLB DES			Credible bomb threat or pressurisation problem, but no quick landing possible (due to weather, terrain or other reasons)		x			x	x		x	
		APP			Diversion with low remaining fuel or increased fuel flow due to system malfunction	x				x		x	x	

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Generation 3 Turboprop — Recurrent assessment and training matrix							Competency map								
EVAL or SBT			APP		Situation awareness and management of information: Have an awareness of the aircraft state in its environment; project and anticipate changes. Workload management: Prioritise, delegate and receive assistance to maximise focus on the task. Continuously monitor the flight progress.	ACAS warning immediately following a go-around, with a descent manoeuvre required		x			x	x	x	X	
EVAL or SBT	Compliance	A	ALL	Compliance failure. Consequences of not complying with operating instructions (e.g. SOPs). This is not intended to list example scenario elements, but instructors should ensure that observed non-compliances are taken as learning opportunities throughout the programme. In all modules of the programme, the FSTD should as far as possible be treated like an aircraft, and non-compliances should not be accepted simply for expediency.	Recognise that a compliance failure has occurred. Make a verbal announcement. Take appropriate action if necessary. Restore safe flight path if necessary. Manage consequences.	The following are examples of potential compliance failures and are not intended to be developed as scenarios as part of an EBT module: 1. Requesting flap beyond limit speed 2. Flaps or slats in the wrong position for phase of flight or approach 3. Omitting an action as part of a procedure 4. Failing to initiate or complete a checklist 5. Using the wrong checklist for the situation	Intentionally blank								
EVAL or SBT	Go-around management	A	APP	Any threat or error that can result in circumstances that require a decision to perform a go-around, in addition to the execution of the go-around. Go-around scenarios should be fully developed to encourage effective leadership and teamwork, in addition to problem-solving and decision-making, plus execution using manual aircraft control or the flight management system(s) and automation as applicable. Design should include the element of surprise, and scenario-based go-arounds should not be predictable and anticipated. This topic is completely distinct from the go-around manoeuvre listed in the MT section that is intended only to practise psychomotor skills and a simple application of the procedures.		Adverse-weather scenario leading to a reactive wind shear warning during approach	x	x					x	x	
			APP			Adverse-weather scenario leading to a predictive wind shear warning during approach or go-around	x	x					x	x	
			APP			Adverse-weather scenario, e.g. thunderstorm activity, heavy precipitation or icing forcing decision at or close to DA/MDA	x					x	x	x	
			APP			DA with visual reference in heavy precipitation with doubt about the runway surface braking capability	x					x	x	x	
			APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
			APP			Lost or difficult communications resulting in no approach clearance prior to commencement of approach or final descent	x		x				x		
			APP			Birds: large flocks of birds below DA once visual reference has been established				x		x	x		
			APP			System malfunction, landing gear malfunction during the approach									

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Generation 3 Turboprop — Recurrent assessment and training matrix						Competency map								
EVAL or SBT Manual aircraft control	A	CLB CRZ DES APP	Controls the flight path through manual control	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the normal flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	Flight with unreliable airspeed, which may or may not be recoverable	x			x			x		X
		CLB CRZ DES APP			Alternate flight control modes according to malfunction characteristics	x			x				x	X
		CLB CRZ DES APP			ACAS RA requires the pilot to descend or ATC calls for immediate descent	x	x		x					
		DES			TAWS warning when deviating from planned descent routing, requiring immediate response	x			x	x				
		TO			Scenario immediately after take-off which requires an immediate and overweight landing			x	x	x	x			
		TO			Adverse wind, crosswinds with or without strong gusts on take-off	x			x					
		TO			Adverse weather, wind shear, wind shear encounter during take-off, with or without reactive warnings	x			x			x		
		TO			Engine failure during initial climb, typically 30-60 m (100-200 ft) (autopilot off)	x	x		x				x	
		CRZ			Wind shear encounter scenario during cruise, significant and rapid change in wind speed or down/updrafts, without wind shear warning	x		x			x	x	x	
		APP			Adverse weather, wind shear, wind shear encounter with or without warning during approach	x		x	x			x		
		APP			Adverse weather, deterioration in visibility or cloud base, or adverse wind, requiring a go-around from visual circling approach, during the visual segment	x	x	x	x		x	x	x	
		APP			Interception of the glide slope from above (correlation with unstable approach training)			x				x	x	
		APP LDG			Adverse wind, crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
		APP LDG			Adverse weather, adverse wind, approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
		APP LDG			Circling approach manually flown at night in minimum in-flight visibility to ensure ground reference, minimum environmental lighting and no glide slope guidance lights	X			X			X	X	
		APP LDG			Runway incursion during approach, which can be triggered by ATC at various altitudes or by visual contact during the landing phase	x			x			x		
		LDG			Adverse wind, visibility, type-specific, special consideration for long-bodied aircraft, landing in minimum visibility for visual reference, with crosswind	x	x		x			x		
		LDG			System malfunction, auto flight failure at DA during a low-visibility approach requiring a go-around flown manually	x		x	x			x		
		APP LDG			Approach planned with autoland, followed by a failure below 1 000 ft requiring a manual go-around and an immediate landing due to fuel shortage	x		x		x		x		
		TO			In-seat instruction: Insufficient engine failure recovery, forcing the pilot monitoring to take over the flight controls		x		x			x	x	
		APP LDG			In-seat instruction: Unstable approach on short final or long landing, forcing the pilot monitoring to take over the flight controls		x		x			x	x	

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Generation 3 Turboprop — Recurrent assessment and training matrix						Competency map								
EVAL or SBT — Monitoring, cross-checking, error management, mismanaged aircraft state	A	ALL	The scenarios should be realistic and relevant, and should be used for the purpose of demonstration and reinforcement of effective monitoring. Modules in the FSTD should be treated like those in an aircraft so that trainees have the opportunity to develop the competency with the practice of the right techniques and attitudes related to these topics through pilot performance, and that instructors have the opportunity to assess and train these topics in a realistic environment. As shown by the EBT data report, these topics are of key importance to improve safety in operations. In addition, the operator may also use these topics to develop scripted role-playing scenarios in the form of ISI. These scenarios cater for the need to monitor flight path excursions from the instructor pilot (PF), detect errors and make appropriate interventions, either verbally or by taking control as applicable. Demonstration scenarios may also be used. Demonstrated role-play should contain realistic and not gross errors, leading at times to a mismanaged aircraft state, which can also be combined with upset management training.	Recognise mismanaged aircraft state. Observe the pilot's behaviour: how the pilot is mitigating errors, performing cross-checking, monitoring performance and dealing with a mismanaged aircraft state, in order to ensure that observed deviations, errors and mistakes are taken as learning opportunities throughout the programme. Monitor flight path excursions. Detect errors and threats through proper cross-checking performance. Make appropriate interventions either verbally or by taking control if applicable. Take appropriate action if necessary. Restore the desired aircraft state. Identify and manage consequences.	Deviations from the flight path, in pitch attitude, speed, altitude, bank angle		x					x		
		ALL			In-seat instruction: Simple automation errors (e.g. incorrect mode selection, attempted engagement without the necessary conditions, entering wrong altitude or speed, failure to execute the desired mode) culminating in a need for direct intervention from the pilot monitoring, and where necessary taking control.		x					x		
		APP			In-seat instruction: Unstable approach or speed/path/vertical rate not congruent with the required state for the given flight condition	x	x					x	x	
		LDG			In-seat instruction: Demonstration exercise — recovery from bounced landing, adverse wind, strong gusts during landing phase, resulting in a bounce and necessitating recovery action from the pilot monitoring	x			x			x		
	A	DES APP	Reinforce stabilised approach philosophy and adherence to defined parameters. Encourage go-arounds when crews are outside these parameters. Develop and sustain competencies related to the management of high-energy situations.		ATC or terrain-related environment creating a high-energy descent with the need to capture the optimum profile to complete the approach in a stabilised configuration	x		x				x		
Unstable approach		DES APP			ATC or terrain-related environment creating a high-energy descent leading to unstable conditions and requiring a go-around	x		x				x		
		APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
		APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
		APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			

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Section 5 — UPRT training topic with frequency (B). Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)														
EVAL, MT or SBT	Upset prevention training	B	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include upset prevention elements in Table 1 for the recurrent training programme in at least every cycle, such that all the elements are covered over a period not exceeding 3 years. The elements are numbered with letters from A to I in Table 1 of AMC1 ORO.FC.220&230. Each element is made up of several numbered components. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recognising and preventing the development of upset conditions.	Early recognition and prevention of upset conditions. When the differences between LHS and RHS are not significant in the handling of the aircraft, UPRT may be conducted in either seat.	See Table 1 of AMC1 ORO.FC.220&230: Elements and respective components of upset prevention training.	Intentionally blank								
			CRZ		Demonstration of the defined normal flight envelope and any associated changes in flight instruments, flight director systems, and protection systems. This should take the form of an instructor-led exercise to show the crew the points beyond which an upset condition could exist.			x					x	x
			TO APP		Severe wind shear or wake turbulence during take-off or approach			x	x		x	x		
			CRZ		As applicable and relevant to the aircraft type, demonstration at a suitable intermediate level, with turbulence as appropriate; practise steep turns and note the relationship between bank angle, pitch and stalling speed				x			x		x
			CRZ		At the maximum cruise flight level for the current aircraft weight, turbulence to trigger overspeed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism)	x		x	x			x		
			CRZ		At the maximum cruise flight level for the current aircraft weight, turbulence and significant temperature rise to trigger low-speed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism)			x	x			x		X
			CRZ		High-altitude loss of reliable airspeed	x	x		x			x	x	
			CRZ		High-altitude TCAS RA (where the RA is required to be flown in manual flight)	x			x			x	x	

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 6 — Training topics with frequency (B) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)														
EVAL or SBT	Aircraft system malfunctions, including operations under MEL	B	ALL	Any internal failure(s) apparent or not apparent to the crew Any item cleared by the MEL but having an impact upon flight operations — for instance, thrust reverser locked. Malfunctions to be considered should have one or more of the following characteristics: — Immediacy — Complexity — Degradation of aircraft control — Loss of primary instrumentation — Management of consequences The operator should vary malfunctions for each characteristic over the EBT cycle. Unless specified otherwise in the operational suitability data, at least one malfunction with each characteristic should be included in every cycle. Combining characteristics should not reduce the number of malfunctions below seven for each cycle. For each crew member, the	Recognise system malfunction. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences. Apply crew operating procedures where necessary. Respond appropriately to additional system abnormalities associated with MEL dispatch.	(i) System malfunctions that require immediate and urgent crew intervention or decision, e.g. fire, smoke, loss of pressurisation at high altitude, failures during take-off, brake failure during landing. (ii) System malfunctions that require complex procedures, e.g. multiple hydraulic system failures, smoke and fumes procedures, major electrical system failure. (iii) System malfunctions that result in significant degradation of flight controls in combination with abnormal handling characteristics, e.g. jammed flight controls, certain degradation of FBW control, jammed horizontal stabiliser; flaps and/or slats locked; other malfunctions that result in degraded flight controls. (iv) System failures that require monitoring and management of the flight path using degraded or alternative displays, unreliable primary flight path information, unreliable airspeed, e.g. flight with unreliable airspeed (v) System failures that require extensive management of their consequences (independent of operation or environment), e.g. fuel leak.	Intentionally blank								
			TO		MEL items with crew operating procedures applicable during take-off						x			X
			TO		Response to an additional factor that is affected by an MEL item (e.g. system failure, runway state)		x		x		x			X
			GND		Malfunction during preflight preparation and prior to departure	x					x	x		
			CLB		Malfunction after departure	x					x	x		X
			ALL		Malfunctions that require immediate attention (e.g. bleed fault during engine start, hydraulic failure during taxi)	x				x			x	
			CLB CRZ		Fuel leak (management of consequences)	x				x		x		X
			TO		Malfunction on take-off high speed below V1	x				x	x			
			TO		Malfunction on take-off high speed above V1	x					x			
			GND		During taxi to the runway, a spurious brake temperature announcement. The crew had the correct brake temperature moments before the failure.					X	X	X		
			TO		Tyre failure during take-off					x	x		x	

			TO APP APP LDG	characteristics of degraded control and loss of instrumentation should be in the role of pilot flying and the others may be in the role of pilot flying or pilot monitoring. For full details, see the malfunction equivalency methodology.		Malfunction on initial climb Malfunction on approach Malfunction on go-around Malfunction during landing	x x x x	 x	 	 x	 	x x x x	 x	 x x 	 	
EVAL or SBT	Aircraft system management	B	 CRZ APP LDG	Normal system operation according to defined instructions	This is not considered as a stand-alone topic. It is linked with the topic 'compliance'. Where a system is not managed according to normal or defined procedures, this is determined as a non-compliance.	See 'compliance' topic above. There are no defined scenarios, but the instructor should focus on learning opportunities when system management non-compliances manifest themselves during other scenarios. Underpinning knowledge of systems and their interactions should be developed and challenged, and not merely the application of normal procedures. Minimum fuel, caused by extended delays, weather, etc. where the crew would need to manage a minimum fuel situation	Intentionally blank 									X
	Approach, visibility close to minimum	B	APP APP LDG	Any situation where visibility becomes a threat	Recognise actual conditions. Observe aircraft and/or procedural limitations. Apply the appropriate procedures if applicable. Maintain directional control and safe flight path.	Approach in poor visibility Approach in poor visibility with deteriorations necessitating a decision to perform a go-around Landing in poor visibility	x x 	 	x x 	x x x	 	 x	 x	x 	 	
	Landing	B	LDG	Pilots should have opportunities to practise landings in demanding situations at the defined frequency. Data indicates that landing problems have their roots in a variety of factors, including inappropriate decision-making, in addition to manual aircraft control skills if difficult environmental conditions exist. The purpose of this item is to ensure that pilots are exposed to this during the programme.	Landing in demanding environmental conditions, with malfunctions as appropriate	This topic should be combined with the adverse-weather topic, aircraft system malfunctions topic or any topic that can provide exposure to a landing in demanding conditions.	Intentionally blank									
EVAL or SBT	Surprise	B	ALL	The data analysed during the development of the EBT concept indicated substantial difficulties encountered by crews when faced with a threat or error, which was a surprise or an unexpected event. The element of surprise should be distinguished from what is sometimes referred to as the 'startle factor' — the latter being a physiological reaction. Wherever possible, consideration should be given towards variations in the types of scenario, times of occurrences and types of occurrence, so that pilots do not become overly familiar with repetitions of the same scenarios. Variations should be the focus of EBT programme design, and not left to the discretion of individual instructors, in order to preserve programme integrity and fairness.	Exposure to an unexpected event or sequence of events at the defined frequency in order to build resilience.	Rejected take-off Intentionally blank	X Intentionally blank			X 		X 				

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Terrain	B	ALL	Alert, warning, or conflict	Anticipate terrain threats. Prepare for terrain threats. Recognise unsafe terrain clearance. Take appropriate action. Apply the appropriate procedures correctly. Maintain aircraft control. Restore safe flight path. Manage consequences.	ATC clearance giving insufficient terrain clearance	x	x			x				
			ALL			Demonstration of terrain avoidance warning systems (TAWS) (this scenario element may be done in an ISI.)						x	x	x	
			TO CLB			Engine failure where performance is marginal leading to TAWS warning		x		x				x	
			DES APP			ATC provides a wrong QNH		x					x		
			DES			'Virtual mountain' refers to the surprise element of an unexpected warning. Care should be exercised in creating a level of realism, so this can best be achieved by an unusual and unexpected change of route during the descent.						x	x	x	
EVAL or SBT	Wind shear recovery	B	TO	With or without warnings including predictive. A wind shear scenario is ideally combined with an adverse-weather scenario containing other elements.	Anticipate potential for wind shear. Avoid known wind shear or prepare for suspected wind shear. Recognise wind shear encounter. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control. Recognise out of wind shear condition. Maintain or restore a safe flight path. Assess consequential issues and manage outcomes.	Predictive wind shear warning during take-off					x	x			
			TO			Wind shear encounter during take-off	x				x	x			
			TO			Wind shear encounter after rotation						x		x	
			TO			Predictive wind shear after rotation					x	x			
			APP			Predictive wind shear during approach	x				x	x			
			APP			Wind shear encounter during go-around	x				x	x		x	
			APP			Wind shear encounter during approach	x				x	x			
	Workload, distraction, pressure, stress	B	ALL	This is not considered a topic for specific attention on its own, but more as a reminder to programme developers to ensure that pilots are exposed to immersive training scenarios which expose them to manageable high workload and distractions during the course of the EBT programme, at the defined frequency.	Manage available resources efficiently to prioritise and perform tasks in a timely manner under all circumstances.	Intentionally blank	Intentionally blank								

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 7 — UPRT Upset recovery training topic with frequency (C). Manoeuvres training phase or scenario-based training phase (MT or SBT)															
MT or SBT	Upset recovery	C	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include the recovery exercises in Table 2 of AMC1 ORO.FC.220&230 for the recurrent training programme, such that all the exercises are covered over a period not exceeding 3 years. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recovery from developed upsets. The same principles apply to the exercises of components 2, 3 and 4 where one exercise may satisfy the requirement to cover the whole component. An aeroplane upset is defined as an undesired aeroplane state in flight characterised by unintentional divergences from parameters normally experienced during line operations or training. An aeroplane upset may involve pitch and/or bank angle divergences as well as inappropriate airspeeds for the conditions.	Recognise upset condition. Make timely and appropriate intervention. Take appropriate action. Assure timely and appropriate intervention. (AMC1 ORO.FC.220&230 Table 2 component 1) Assure aircraft control. Maintain or restore a safe flight path. Assess consequential issues. Manage outcomes. Consolidate the summary of aeroplane recovery techniques. (AMC1 ORO.FC.220&230 Table 2 component 5) Note: The operator should assess if the exercises should be practised for the either seat qualification.	The example scenario elements may be done in ISI, as non-ISI or a combination of both. If done in ISI: The instructor should position the aircraft within but close to the edge of the validated training envelope before handing control to the trainee to demonstrate the restoration of normal flight. Careful consideration should be given to flying within the validated training envelope.	Intentionally blank								
						Table 2 of AMC1 ORO.FC.220&230: Exercises for upset recovery training									
						A. **Recovery from developed upsets**									
			CLB DES			2. Recovery from stall events in the following configurations: — take-off configuration, — clean configuration low altitude, — clean configuration near maximum operating altitude, and — landing configuration during the approach phase.	x			x			x	x	
			CRZ			3. Recovery from nose high at various bank angles	x			x			x	x	
			CRZ			4. Recovery from nose low at various bank angles	x			x			x	x	
			CRZ												
			APP			Demonstration at a normal cruising altitude. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
			CLB DES			Demonstration at an intermediate altitude during early stages of the approach. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
						Recovery from a wake turbulence position with high-bank angle	x		x	x			x		

Section 8 — Training topics with frequency (C) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)															
EVAL or SBT	Adverse wind	C	TO	Adverse wind/crosswind. This includes tailwind but not ATC mis-reporting of the actual wind.	Recognise adverse-wind conditions. Observe limitations. Apply the appropriate procedures. Maintain directional control and safe flight path.	Take-off with different crosswind/tailwind/gust conditions						x		x	
			TO			Take-off with unreported tailwind		x			x				
			TO			Crosswinds with or without strong gusts on take-off	x			x					
			APP			Wind exceeding limits on final approach (not reported)	x	x				x	x		
			APP			Wind exceeding limits on final approach (reported) in manual aircraft control	x	x		x		x			
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswind including shifting wind directions				x		x	x		
			APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
			APP LDG			Crosswind with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	ATC	C	ALL	ATC error. Omission, miscommunication, garbled, poor quality transmission. All these act as distractions to be managed by the crew. The scenarios should be combined, where possible, with others of the same or higher weighting, the principal reason being to create distractions.	Respond to communications appropriately. Recognise, clarify and resolve any ambiguities. Refuse or question unsafe instructions. Use standard phraseology whenever possible.	ATC role-play: the instructor provides scripted instructions, as a distraction to the crew	x	x			x				
			ALL			Controller error, provided by the instructor according to a defined scripted scenario	x	x				x	x		
			ALL			Frequency congestion, with multiple aircraft using the same frequency		x							
			APP			Destination temporarily closed					x	x	x	x	
			CRZ			Rescue and firefighting services (RFFS) level reduction at destination		x			x		x		
			APP			Runway change before the interception of the localiser or similar navigation aid in azimuth			x		x		x	x	
			GND TO			Stray dogs at the opposite threshold runway		x			x		x		
			ALL			Poor quality transmissions		x							
EVAL or SBT	Engine failure	C	TO	Any engine failure or malfunction, which causes loss or degradation of thrust that affects performance. This is distinct from the engine-out manoeuvres described in the MT section above, which are intended only to practise psychomotor skills and reinforce procedures to manage engine failures.	Recognise engine failure. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Engine failure or engine malfunction on take-off low speed	x			x		x		x	
			TO			Engine failure or engine malfunction on take-off high speed below V1	x			x		x		x	
			TO			Engine failure or engine malfunction on take-off above V1	x					x	x	x	
			TO			Engine failure or engine malfunction on initial climb	x					x	x		
			APP			Engine malfunction	x					x		x	
			CRZ			Engine failure in cruise (with autopilot)	x		x				x		
			LDG			Engine failure or engine malfunction on landing				x					
EVAL or SBT	Fire and smoke management	C	GND	This includes engine, electric, pneumatic, cargo fire, smoke or fumes.	Recognise fire, smoke or fumes. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Fire in cargo or cabin/cockpit at gate	x	x				x		x	
			GND			Fire during taxi	x	x				x		x	X
			GND			Fire with no cockpit indication	x	x				x		x	X
			TO			Take-off low speed	x			x	x	x			X
			TO			Fire or smoke on take-off high speed below V1	x			x	x	x			
			TO			Fire or smoke on take-off high speed above V1	x				x	x			
			TO			Fire or smoke on initial climb	x				x	x			
			CRZ			Cargo fire						x	x	x	
			APP			Engine fire in approach (extinguishable)		x				x			
			APP			Engine fire in approach (non-extinguishable)		x			x	x			
			CLB CRZ DES			Lithium battery fire in the cockpit or cabin compartment	x	x			x	x		x	
			APP			Flight deck or cabin fire		x			x	x			X
			GND			Any of the example scenario elements above ending in an evacuation		x			x	x		x	
EVAL or SBT	Loss of communications	C	GND	Lost or difficult communications due to either pilot mis-selection or a failure external to the aircraft. This could be for a few seconds or a total loss.	Recognise loss of communications. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative ways to communicate. Manage consequences.	Loss of communications during ground manoeuvring	x	x							
			TO			Loss of communications after take-off	x					x			X
			APP			Loss of communications during approach phase, including go-around	x	x				x	x		X

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Managing loading, fuel, performance errors	C	ALL	A calculation error by one or more pilots, or someone involved with the process, or the process itself, e.g. incorrect information on the load sheet	Anticipate the potential for errors in load/fuel/performance data. Recognise inconsistencies. Manage/avoid distractions. Make changes to paperwork/aircraft system(s) to eliminate error. Identify and manage consequences.	This can be a demonstrated error, in that the crew may be instructed to deliberately insert incorrect data — for example, to take off from an intersection with full-length performance information. The crew will be asked to intervene when acceleration is sensed to be lower than normal, and this may be part of the operator procedures, especially when operating mixed fleets with considerable variations in MTOM.	x	x						x	
			GND			Fuel ground staff on industrial action. Only limited amount of fuel available, which is below the calculated fuel for the flight.					x	x	x	x	
			GND			Advise crew that there is a change of the load sheet figures during taxi to the runway. The crew may have limited time due to a calculated take-off time (CTOT) — ATC slot.	x							x	
			GND			Braking action reported 'medium'. The information is transmitted just before take-off. The flight is subject to a (CTOT) — ATC slot.					x		x	x	
EVAL or SBT	Navigation	C	GND	External NAV failure. Loss of GPS satellite, ANP exceeding RNP, loss of external NAV source(s)	Recognise a NAV degradation. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative NAV guidance. Manage consequences.	External failure or a combination of external failures degrading aircraft navigation performance on ground	x		x			x	x		
			TO CLB APP LDG			External failure or a combination of external failures degrading aircraft navigation performance in flight		x			x	x	x		
			GND			Standard initial departure change during taxi. The flight may be subject to a CTOT — ATC slot.					x		x	x	
			APP			Loss of runway lighting below decision height		x				x	x		
			CRZ			No fly zone: when the crew changes control frequency, the new ATCO informs the crew that they are flying over an unannounced 'no fly zone' that is not included in the NOTAMs. (To trigger such an event, the context may be as follows: an unexpected military conflict in the territory the aircraft is flying over or the crew is forced to re-route in flight and the new route flies over a city that has an important event such the Olympic games, a G20/G7 submit, or the route is flying near a space rocket launch close to the time of the launch, like the Guiana Space Centre, Cape Cañaveral, etc.).					x	x	x		
	Operations- or type-specific	C	ALL	Intentionally blank	Intentionally blank	Intentionally blank	Intentionally blank								
	Operations of special airport approval	C	APP LDG	See equivalency of approaches relevant to operations.	The operator should comply with the national qualification requirements published in the Aeronautical Information Publication.	Intentionally blank	Intentionally blank								
EVAL or SBT	Pilot incapacitation	C	TO	Consequences for the non-incapacitated pilot	Recognise incapacitation. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	During take-off	x	x			x	x			X
			APP			During approach	x			x				x	X
	Runway or taxiway condition	C	GND TO LDG	Contamination or surface quality of the runway, taxiway, or tarmac including foreign objects	Recognise hazardous runway condition. Observe limitations. Take appropriate action. Apply the appropriate procedures correctly. Assure aircraft control.	Planned anticipated hazardous conditions with dispatch information provided to facilitate planning and execution of appropriate procedures						x			X
			GND TO LDG			Unanticipated hazardous conditions, e.g. unexpected heavy rain resulting in flooded runway surface		x			x	x			
			TO			Take-off on runway with reduced cleared width due to snow	x			x	x		x		
			TO			Stop/go decision in hazardous conditions					x	x		x	

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Traffic	C	CLB CRZ DES	Traffic conflict. ACAS RA or TA, or visual observation of conflict, which requires evasive manoeuvring	Anticipate potential loss of separation. Recognise loss of separation. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	ACAS warning that requires crew intervention		x				x	x	x	

END GEN3 TURBOPROP

AMC5 ORO.FC.232 EBT programme assessment and training topics

GENERATION 2 (JET) — EBT PROGRAMME — TABLE OF ASSESSMENT AND TRAINING TOPICS

Given the very small number of turbo-jet aeroplanes of the second generation in current use in commercial air transport operations, the operator should apply for an alternative means of compliance to develop a table of assessment and training topics to apply EBT.

AMC6 ORO.FC.232 EBT programme assessment and training topics

GENERATION 2 (TURBOPROP) — TABLE OF ASSESSMENT AND TRAINING TOPICS

	Assessment and training topic	*Frequency*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Flight phase activation*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
	Generation 2 Turboprop — Recurrent assessment and training matrix						*Competency map*								
Section 1 — Skill retention. Manoeuvres training phase (MT)															
MT	Rejected take-off	A	Engine failure after the application of take-off thrust and before reaching V1 (may be in LVO or CAT I or above)	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	From initiation of take-off to complete stop (or as applicable to the procedure)	x			x					
	Failure of the critical engine between V1 and V2	A	Failure of the critical engine from V1 and before reaching V2 in the lowest CAT I visibility or in LVO meteorological (MET) conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
	Failure of one engine on take-off	B	Failure of one engine from V1 and before reaching V2 in the lowest CAT I visibility or in LVO MET conditions.		TO	The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed. Only one failure of the critical engine between V1 and V2 a year may be done in LVO conditions.	x			x					
			Failure of one engine above V2 (any segment of the TO) in the lowest CAT I visibility or in LVO MET conditions.			The manoeuvre is complete at a point when the aircraft is stabilised in a clean configuration with engine-out procedures completed	x		x	x					
	Emergency descent	C	Initiation of emergency descent from normal cruise altitude		CRZ	The manoeuvre is complete once the aircraft is stabilised in emergency descent configuration (and profile).	x		x	x					
	Engine-out approach & landing	A	With the critical engine (if applicable) failed, normal landing		LDG	Initiation in a stabilised engine-out configuration from not less than 3 NM final approach, until completion of roll-out	x			x					
	Engine-out approach & go-around	A	With the critical engine (if applicable) failed, manually flown normal precision approach to DA, followed by a manual go-around — the whole manoeuvre to be flown without visual reference		APP	This manoeuvre should be flown from intercept to centreline until acceleration after go-around. The manoeuvre is complete at a point when the aircraft is stabilised at normal engine-out climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement (describe generally the critical part of the manoeuvre).	x			x					
	Go-around	A	Go-around, all engines operative		APP	High energy, initiation during the approach at 150 to 300 m (500 to 1 000 ft) below the missed approach level-off altitude	x		x	x					
						Initiation of a go-around from DA followed by visual circuit and landing	x		x	x					
						During flare/rejected landing	x		x	x					
	Pilot qualification to operate in either pilot's seat	B	As per ORO.FC.235		APP	Complete the manoeuvres mandated in ORO.FC.235.	Intentionally left in blank.								

		Assessment and training topic	Frequency	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Flight phase activation	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 2 Turboprop — Recurrent assessment and training matrix								Competency map								
Section 2 — Equivalency of approaches relevant to operations. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)																
MT		Approach type A or B	B	Approach type A or B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
MT		Approach type A	B	Approach type A flight method 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
EVAL or SBT		Approach type A	B	Approach type A flight method 3D or 2D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
EVAL or SBT		Approach type B	B	Approach type B flight method 3D	See equivalency of approaches relevant to operations that place an additional demand on a proficient crew	APP	See equivalency of approaches relevant to operations	X		X	X			X		X
Section 3 – Equivalency of approaches under specific approvals and take-off under specific approvals. Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)																
MT		SPA approach(es)	B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL or SBT		SPA approach(es)	B	Approach requiring specific approval	See equivalency of approaches relevant to operations — specific approval	APP	Approaches flown from FAF to landing or go-around	x		x	x					
EVAL, MT or SBT		SPA rejected Take-off (RTO)	B	Engine failure after the application of take-off thrust and before reaching V1 (in low-visibility MET conditions, preferably in the lowest approved visibility) Low-visibility RTO is not required under Part SPA but instead in Appendix 9 Section 6. Note: AMC1 SPA.LVO.120 point (f) does not require a low-visibility RTO. RTO is required only in the initial LVO course (point (g)(1)(iii) of AMC1 SPA.LVO.120).	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	TO	RTO — can be combined with the assessment and training topic 'surprise' in EVAL or SBT	X			X					
VAL, MT or SBT		LVTO	B	Notwithstanding AMC1 SPA.LVO120 point (f)(1) AMC1 SPA.LVO.120 requires SPA manoeuvres in the frequency of the OPC, as OPC is substituted in the EBT programme. Thus, the frequency in EBT is determined in every cycle (B).		TO	The manoeuvre may is complete at a point when the aircraft is stabilised at normal climb speed with the correct pitch and lateral control, in trim condition and, as applicable, autopilot engagement.	x			x					

			Low-visibility take-off, preferably in the lowest approved visibility																

Assessment and training topic	*Frequency*	*Flight phase activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
Generation 2 Turboprop — Recurrent assessment and training matrix						*Competency map*								
Section 4 — Training topics with frequency (A) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)														
EVAL or SBT	Adverse weather	A	GND	Thunderstorm, heavy rain, turbulence, ice build-up to include de-icing issues, as well as high-temperature conditions. The proper use of anti-ice and de-icing systems should be included generally in appropriate scenarios.	Anticipate adverse weather. Prepare for suspected adverse weather. Recognise adverse weather. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control.	Predictive wind shear warning before take-off, as applicable	x	x				x			
			ALL			Adverse-weather scenario, e.g. thunderstorm activity, precipitation, icing		x			x	x		x	
			TO			Wind shear encounter during take-off, not predictive	x			x			x		X
			TO			Predictive wind shear warning during take-off	x	x				x	x		
			TO			Crosswinds with or without strong gusts on take-off	x			x					
			CRZ			Turbulence that increases to severe turbulence		x			x		x	x	
			CRZ			Wind shear encounter scenario during cruise	x		x			x	x	x	
			APP			Reactive wind shear warning during approach or go-around	x		x	x			x		
			APP			Predictive wind shear warning during approach or go-around	x	x				x	x		
			APP			Thunderstorm encounter during approach or on missed approach	x					x	x		
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
			APP			Non-precision approach in cold-temperature conditions, requiring altitude compensation for temperature, as applicable to the type	x	x					x		
			APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
			APP			In approach, unexpected braking action 'good to medium' reported by the preceding aircraft		x				x	x	x	
			APP			Moderate to severe icing conditions during approach effecting aircraft performance	x	x				x	x		
			APP			Reduced visibility even after acquiring the necessary visual reference during approach, due to rain or fog	x	x				x			
EVAL or SBT	Aircraft system management	A	N/A	Normal system operation according to defined instructions	This is not considered as a stand-alone topic. It is linked with the topic 'compliance'. Where a system is not managed according to normal or defined procedures, this is determined as a non-compliance.	See 'compliance' topic above. There are no defined scenarios, but the instructor should focus on learning opportunities when system management non-compliances manifest themselves during other scenarios. Underpinning knowledge of systems and their interactions should be developed and challenged, and not merely the application of normal procedures.	Intentionally blank								X
			CRZ APP LDG			Minimum fuel, caused by extended delays, weather, etc. where the crew would need to manage a minimum fuel situation.					x	x	x	x	
EVAL or SBT	Automation management	A	CLB CRZ DES APP	The purpose of this topic is to encourage and develop effective flight path management through proficient and appropriate use of the flight management system(s), guidance and automation, including transitions between modes, monitoring, mode awareness,	Know how and when to use the flight management system(s), guidance and automation. Demonstrate correct methods for engagement and disengagement of the auto flight system(s).	ACAS warning, recovery and subsequent engagement of automation	x		x						
			ALL			FMS tactical programming issues, e.g. step climb, runway changes, late clearances, destination re-programming, executing diversion	x		x						X
			CLB CRZ			Recoveries from TAWS, management of energy state to restore automated flight	x		x	x					

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 2 Turboprop — Recurrent assessment and training matrix						Competency map								
		DES APP	vigilance and flexibility needed to change from one mode to another. The means of mitigating errors are included in this topic. The errors are described as mishandled auto flight systems, inappropriate mode selection, mishandled flight management system(s) and inappropriate autopilot usage.	Demonstrate appropriate use of flight guidance, auto thrust and other automation systems. Maintain mode awareness of the auto flight system(s), including engagement and automatic transitions. Revert to different modes when appropriate. Detect deviations from the desired aircraft state (flight path, speed, attitude, thrust, etc.) and take appropriate action. Anticipate mishandled auto flight system. Recognise mishandled auto flight system. Take appropriate action if necessary. Restore correct auto flight state. Identify and manage consequences.										
		CLB CRZ DES APP			Amendments to ATC cleared levels during altitude capture modes to force mode awareness and intervention	x		x				x		
		TO			Late ATC clearance to an altitude below acceleration altitude	x		x				x		
		TO APP			Engine-out special terrain procedures	x		x				x		
		CRZ			Forcing autopilot disconnect followed by re-engagement, recovery from low- or high-speed events in cruise	x		x	x			x		
		CLB			Engine failure during or after initial climb using automation	x		x						
		CRZ			Engine failure in cruise to onset of descent using automation	x		x						
		CRZ			Emergency descent	x		x						X
		DES APP			Managing high-energy descent capturing descent path from above (correlation with unstable approach training)	x		x				x		X
		APP			No ATC clearance received prior to commencement of approach or final descent	x		x				x		
		APP			Reactive wind shear and recovery from the consequent high-energy state	x		x				x		
		APP			Automation fail to capture the approach altitude in descent (e.g. last altitude before the FAP). Ideally, the failure occurs when the workload is high (e.g. configuration of the aircraft for final approach).					x	x	x	x	
		APP			Non-precision or infrequently flown approaches using the maximum available level of automation	x		x						X
		APP			Gear malfunction during an approach planned with autoland (including autobrake). Competency FPA may or may not be included depending on the impact of such malfunction on the automation.		x				x		x	
		APP			ATC clearances to waypoints beyond the programmed descent point for a coded final descent point during an approach utilising a final descent that is commanded by the flight management system	x		x				x		X
EVAL or SBT	Competencies — non-technical (CRM)	A	APP	Exposure to an event or sequence of events to allow the pilot to build awareness of human factors in aviation and the human limitations. This includes the development of the following competencies: <u>Communication:</u> Demonstrate: — effective use of language; — responsiveness to feedback; and — capability to state the plans and resolve ambiguities. <u>Leadership and teamwork:</u> Use appropriate authority to ensure focus on the task. Support others in completing tasks. <u>Problem-solving and decision-making:</u>	This encapsulates the general CRM principles and objectives. It includes communication; leadership and teamwork; problem-solving and decision-making; situation awareness and management of information; and workload management. Emphasis should be placed on the development of leadership, shown by EBT data sources to be a highly effective competency in mitigating risk and improving safety through pilot performance.	GPS failure prior to commencement of approach associated with position drift and a terrain alert					x	x	x		x
			DES			Cabin crew report of water noise below the forward galley indicating a possible toilet pipe leak, with consequent avionics failures					x	x	x		
			CRZ			Smoke removal but combined with a diversion until landing is completed.		x			x	x	x	x	x
			GND			Apron fuel spilling					x	x		x	
			CRZ			Important water leak in an aircraft galley		x			x	x		x	
			ALL			A relevant number of cabin crew are wounded or incapacitated. Additionally, the cabin crew wounded or incapacitated are the most competent (e.g. senior cabin crew member).					x	x		x	
			ALL			Unruly passenger(s)					x			x	
			GND			Passenger oxygen: passenger service unit open and mask falling down					x	x		x	
			ALL			Passenger with medical problems — medical emergency					x			x	
			CRZ			Credible threat reported to the crew. Stowaway or fugitive on board.		x			x		x	x	
			GND			No METAR or TAFOR is available for destination due to industrial action at the destination airport	x	x			x	x			

Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Generation 2 Turboprop — Recurrent assessment and training matrix						Competency map								
		CRZ		Detect deviations from the desired state, evaluate problems, identify the risk, consider alternatives and select the best course of action. Continuously review progress and adjust plans. Situation awareness and management of information: Have an awareness of the aircraft state in its environment; project and anticipate changes. Workload management: Prioritise, delegate and receive assistance to maximise focus on the task. Continuously monitor the flight progress.	Credible bomb threat reported to crew		x			x		x	x	
		CLB DES			Credible bomb threat or pressurisation problem, but no quick landing possible (due to weather, terrain or other reasons)		x			x	x		x	
		APP			Diversion with low remaining fuel or increased fuel flow due to system malfunction	x				x		x	x	
		APP			ACAS warning immediately following a go-around, with a descent manoeuvre required		x			x	x	x	X	
EVAL or SBT	Compliance	A	ALL	Compliance failure. Consequences of not complying with operating instructions (e.g. SOPs). This is not intended to list example scenario elements, but instructors should ensure that observed non-compliances are taken as learning opportunities throughout the programme. In all modules of the programme, the FSTD should as far as possible be treated like an aircraft, and non-compliances should not be accepted simply for expediency.	Recognise that a compliance failure has occurred. Make a verbal announcement. Take appropriate action if necessary. Restore safe flight path if necessary. Manage consequences.	The following are examples of potential compliance failures and are not intended to be developed as scenarios as part of an EBT module: 1. Requesting flap beyond limit speed 2. Flaps or slats in the wrong position for phase of flight or approach 3. Omitting an action as part of a procedure 4. Failing to initiate or complete a checklist 5. Using the wrong checklist for the situation	Intentionally blank								
EVAL or SBT	Go-around management	A	APP	Any threat or error that can result in circumstances that require a decision to perform a go-around, in addition to the execution of the go-around. Go-around scenarios should be fully developed to encourage effective leadership and teamwork, in addition to problem-solving and decision-making, plus execution using manual aircraft control or the flight management system(s) and automation as applicable. Design should include the element of surprise, and scenario-based go-arounds should not be predictable and anticipated. This topic is completely distinct from the go-around manoeuvre listed in the MT section that is intended only to practise psychomotor skills and a simple application of the procedures.		Adverse-weather scenario leading to a reactive wind shear warning during approach	x	x					x	x	
			APP			Adverse-weather scenario leading to a predictive wind shear warning during approach or go-around	x	x					x	x	
			APP			Adverse-weather scenario, e.g. thunderstorm activity, heavy precipitation or icing forcing decision at or close to DA/MDA	x					x	x	x	
			APP			DA with visual reference in heavy precipitation with doubt about the runway surface braking capability	x					x	x	x	
			APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
			APP			Lost or difficult communications resulting in no approach clearance prior to commencement of approach or final descent	x		x				x		
			APP			Birds: large flocks of birds below DA once visual reference has been established				x		x	x		
			APP			System malfunction, landing gear malfunction during the approach									

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Manual aircraft control	A	CLB CRZ DES APP	Controls the flight path through manual control	Demonstrate manual aircraft control skills with smoothness and accuracy as appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control. Maintain the aircraft within the normal flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	Flight with unreliable airspeed, which may or may not be recoverable	x			x			x		x
			CLB CRZ DES APP			Alternate flight control modes according to malfunction characteristics	x			x				x	x
			CLB CRZ DES APP			ACAS RA requires the pilot to descend or ATC calls for immediate descent	x	x		x					
			DES			TAWS warning when deviating from planned descent routing, requiring immediate response	x			x	x				
			TO			Scenario immediately after take-off which requires an immediate and overweight landing			x	x	x	x			
			TO			Adverse wind, crosswinds with or without strong gusts on take-off	x			x					
			TO			Adverse weather, wind shear, wind shear encounter during take-off, with or without reactive warnings	x			x			x		
			TO			Engine failure during initial climb, typically 30-60 m (100-200 ft) (autopilot off)	x	x		x				x	
			CRZ			Wind shear encounter scenario during cruise, significant and rapid change in wind speed or down/updrafts, without wind shear warning	x		x			x	x	x	
			APP			Adverse weather, wind shear, wind shear encounter with or without warning during approach	x		x	x			x		
			APP			Adverse weather, deterioration in visibility or cloud base, or adverse wind, requiring a go-around from visual circling approach, during the visual segment	x	x	x	x		x	x	x	
			APP			Interception of the glide slope from above (correlation with unstable approach training)			x				x	x	
			APP LDG			Adverse wind, crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
			APP LDG			Adverse weather, adverse wind, approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
			APP LDG			Circling approach manually flown at night in minimum in-flight visibility to ensure ground reference, minimum environmental lighting and no glide slope guidance lights	X			X			X	X	
			APP LDG			Runway incursion during approach, which can be triggered by ATC at various altitudes or by visual contact during the landing phase	x			x			x		
			LDG			Adverse wind, visibility, type-specific, special consideration for long-bodied aircraft, landing in minimum visibility for visual reference, with crosswind	x	x		x			x		
			LDG			System malfunction, auto flight failure at DA during a low-visibility approach requiring a go-around flown manually	x		x	x			x		
			APP LDG			Approach planned with autoland, followed by a failure below 1 000 ft requiring a manual go-around and an immediate landing due to fuel shortage	x		x		x		x		
			TO			In-seat instruction:		x		x			x	x	

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
						Insufficient engine failure recovery, forcing the pilot monitoring to take over the flight controls									
			APP LDG			In-seat instruction: Unstable approach on short final or long landing, forcing the pilot monitoring to take over the flight controls		x		x			x	x	
EVAL or SBT	Monitoring, cross-checking, error management, mismanaged aircraft state	A	ALL	The scenarios should be realistic and relevant, and should be used for the purpose of demonstration and reinforcement of effective monitoring. Modules in the FSTD should be treated like those in an aircraft so that trainees have the opportunity to develop the competency with the practice of the right techniques and attitudes related to these topics through pilot performance, and that instructors have the opportunity to assess and train these topics in a realistic environment. As shown by the EBT data report, these topics are of key importance to improve safety in operations. In addition, the operator may also use these topics to develop scripted role-playing scenarios in the form of ISI. These scenarios cater for the need to monitor flight path excursions from the instructor pilot (PF), detect errors and make appropriate interventions, either verbally or by taking control as applicable. Demonstration scenarios may also be used. Demonstrated role-play should contain realistic and not gross errors, leading at times to a mismanaged aircraft state, which can also be combined with upset management training.	Recognise mismanaged aircraft state. Observe the pilot's behaviour: how the pilot is mitigating errors, performing cross-checking, monitoring performance and dealing with a mismanaged aircraft state, in order to ensure that observed deviations, errors and mistakes are taken as learning opportunities throughout the programme. Monitor flight path excursions. Detect errors and threats through proper cross-checking performance. Make appropriate interventions either verbally or by taking control if applicable. Take appropriate action if necessary. Restore the desired aircraft state. Identify and manage consequences.	Deviations from the flight path, in pitch attitude, speed, altitude, bank angle		x					x		
			ALL			In-seat instruction: Simple automation errors (e.g. incorrect mode selection, attempted engagement without the necessary conditions, entering wrong altitude or speed, failure to execute the desired mode) culminating in a need for direct intervention from the pilot monitoring, and where necessary taking control.		x					x		
			APP			In-seat instruction: Unstable approach or speed/path/vertical rate not congruent with the required state for the given flight condition	x	x					x	x	
			LDG			In-seat instruction: Demonstration exercise — recovery from bounced landing, adverse wind, strong gusts during landing phase, resulting in a bounce and necessitating recovery action from the pilot monitoring	x			x			x		
	Unstable approach	A	DES APP	Reinforce stabilised approach philosophy and adherence to defined parameters. Encourage go-arounds when crews are outside these parameters. Develop and sustain competencies related to the management of high-energy situations.		ATC or terrain-related environment creating a high-energy descent with the need to capture the optimum profile to complete the approach in a stabilised configuration	x		x				x		
			DES APP			ATC or terrain-related environment creating a high-energy descent leading to unstable conditions and requiring a go-around	x		x				x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswinds including shifting wind directions				x		x	x		
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			

Assessment and training topic	*Frequency*	*Flight phase activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
Section 5 — UPRT training topic with frequency (B). Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)														
EVAL, MT or SBT — Upset prevention training	B	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include upset prevention elements in Table 1 for the recurrent training programme in at least every cycle, such that all the elements are covered over a period not exceeding 3 years. The elements are numbered with letters from A to I in Table 1 of AMC1 ORO.FC.220&230. Each element is made up of several numbered components. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recognising and preventing the development of upset conditions.	Early recognition and prevention of upset conditions. When the differences between LHS and RHS are not significant in the handling of the aircraft, UPRT may be conducted in either seat.	See Table 1 of AMC1 ORO.FC.220&230: Elements and respective components of upset prevention training.	Intentionally blank								
		CRZ			Demonstration of the defined normal flight envelope and any associated changes in flight instruments, flight director systems, and protection systems. This should take the form of an instructor-led exercise to show the crew the points beyond which an upset condition could exist.			x					x	x
		TO APP			Severe wind shear or wake turbulence during take-off or approach			x	x		x	x		
		CRZ			As applicable and relevant to the aircraft type, demonstration at a suitable intermediate level, with turbulence as appropriate; practise steep turns and note the relationship between bank angle, pitch and stalling speed				x			x		x
		CRZ			At the maximum cruise flight level for the current aircraft weight, turbulence to trigger overspeed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism)	x		x	x			x		
		CRZ			At the maximum cruise flight level for the current aircraft weight, turbulence and significant temperature rise to trigger low-speed conditions (if FSTD capability exists, consider use of the vertical wind component to add realism)			x	x			x		X
		CRZ			High-altitude loss of reliable airspeed	x	x		x			x	x	
		CRZ			High-altitude TCAS RA (where the RA is required to be flown in manual flight)	x			x			x	x	

Assessment and training topic	*Frequency*	*Flight phase activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
Section 6 — Training topics with frequency (B) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)														
EVAL, MT or SBT — Aircraft system malfunctions, including operations under MEL	B	ALL	For full details, see the malfunction equivalency methodology. Any internal failure(s) apparent or not apparent to the crew Any item cleared by the MEL but having an impact upon flight operations — for instance, thrust reverser locked. Malfunctions to be considered should have one or more of the following characteristics: — Immediacy — Complexity — Degradation of aircraft control — Loss of primary instrumentation — Management of consequences The operator should vary malfunctions for each characteristic over the EBT cycle. Unless specified otherwise in the operational suitability data, at least	Recognise system malfunction. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences. Apply crew operating procedures where necessary. Respond appropriately to additional system abnormalities associated with MEL dispatch.	(i) System malfunctions that require immediate and urgent crew intervention or decision, e.g. fire, smoke, loss of pressurisation at high altitude, failures during take-off, brake failure during landing. (ii) System malfunctions that require complex procedures, e.g. multiple hydraulic system failures, smoke and fumes procedures, major electrical system failure. (iii) System malfunctions that result in significant degradation of flight controls in combination with abnormal handling characteristics, e.g. jammed flight controls, certain degradation of FBW control, jammed horizontal stabiliser; flaps and/or slats locked; other malfunctions that result in degraded flight controls. (iv) System failures that require monitoring and management of the flight path using degraded or alternative displays, unreliable primary flight path information, unreliable airspeed, e.g. flight with unreliable airspeed (v) System failures that require extensive management of their consequences (independent of operation or environment), e.g. fuel leak.	Intentionally blank								
		TO			MEL items with crew operating procedures applicable during take-off						x			X
		TO			Response to an additional factor that is affected by an MEL item (e.g. system failure, runway state)		x		x		x			X
		GND			Malfunction during preflight preparation and prior to departure	x					x	x		
		CLB			Malfunction after departure	x					x	x		X
		ALL			Malfunctions that require immediate attention (e.g. bleed fault during engine start, hydraulic failure during taxi)	x				x			x	
		CLB CRZ			Fuel leak (management of consequences)	x				x		x		X
		TO			Malfunction on take-off high speed below V1	x				x	x			
		TO			Malfunction on take-off high speed above V1	x					x			

			GND	one malfunction with each characteristic should be included in every cycle. Combining characteristics should not reduce the number of malfunctions below seven for each cycle. For each crew member, the characteristics of degraded control and loss of instrumentation should be in the role of pilot flying and the others may be in the role of pilot flying or pilot monitoring. For full details, see the malfunction equivalency methodology.		During taxi to the runway, a spurious brake temperature announcement. The crew had the correct brake temperature moments before the failure.					X	X	X			
			TO			Tyre failure during take-off					x	x		x		
			TO			Malfunction on initial climb	x					x				
			APP			Malfunction on approach	x					x			x	
			APP			Malfunction on go-around	x					x			x	
			LDG			Malfunction during landing	x	x		x		x	x			
EVAL or SBT	Engine failure	B	TO	Any engine failure or malfunction, which causes loss or degradation of thrust that affects performance. This is distinct from the engine-out manoeuvres described in the MT section above, which are intended only to practise psychomotor skills and reinforce procedures to manage engine failures.	Recognise engine failure. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Engine failure or engine malfunction on take-off low speed	x			x		x		x		
			TO			Engine failure or engine malfunction on take-off high speed below V1	x			x		x		x		
			TO			Engine failure or engine malfunction on take-off above V1	x					x	x	x		
			TO			Engine failure or engine malfunction on initial climb	x					x	x			
			APP			Engine malfunction	x					x		x		
			CRZ			Engine failure in cruise (with autopilot)	x		x				x			
			LDG			Engine failure or engine malfunction on landing				x						
EVAL or SBT	Landing	B	LDG	Pilots should have opportunities to practise landings in demanding situations at the defined frequency. Data indicates that landing problems have their roots in a variety of factors, including inappropriate decision-making, in addition to manual aircraft control skills if difficult environmental conditions exist. The purpose of this item is to ensure that pilots are exposed to this during the programme.	Landing in demanding environmental conditions, with malfunctions as appropriate	This topic should be combined with the adverse-weather topic, aircraft system malfunctions topic or any topic that can provide exposure to a landing in demanding conditions.	Intentionally blank									
EVAL or SBT	Surprise	B	ALL	The data analysed during the development of the EBT concept indicated substantial difficulties encountered by crews when faced with a threat or error, which was a surprise or an unexpected event. The element of surprise should be distinguished from what is sometimes referred to as the 'startle factor' — the latter being a physiological reaction. Wherever possible, consideration should be given towards variations in the types of scenario, times of occurrences and types of occurrence, so that pilots do not become overly familiar with repetitions of the same scenarios. Variations should be the focus of EBT programme design, and not left to the discretion of individual instructors, in order to preserve programme integrity and fairness.	Exposure to an unexpected event or sequence of events at the defined frequency in order to build resilience.	Rejected take-off	X			X		X				
						Intentionally blank	Intentionally blank									

EVAL or SBT	Terrain	B	ALL ALL TO CLB DES APP DES	Alert, warning, or conflict	Anticipate terrain threats. Prepare for terrain threats. Recognise unsafe terrain clearance. Take appropriate action. Apply the appropriate procedures correctly. Maintain aircraft control. Restore safe flight path. Manage consequences.	ATC clearance giving insufficient terrain clearance	x	x			x				
						Demonstration of terrain avoidance warning systems (TAWS) (this scenario element may be done in an ISI.)						x	x	x	
						Engine failure where performance is marginal leading to TAWS warning		x		x				x	
						ATC provides a wrong QNH		x					x		
						'Virtual mountain' refers to the surprise element of an unexpected warning. Care should be exercised in creating a level of realism, so this can best be achieved by an unusual and unexpected change of route during the descent.						x	x	x	
EVAL or SBT	Workload, distraction, pressure, stress	B	ALL	This is not considered a topic for specific attention on its own, but more as a reminder to programme developers to ensure that pilots are exposed to immersive training scenarios which expose them to manageable high workload and distractions during the course of the EBT programme, at the defined frequency.	Manage available resources efficiently to prioritise and perform tasks in a timely manner under all circumstances	Intentionally blank	Intentionally blank								

Assessment and training topic	*Frequency*	*Flight phase activation*	*Description (includes type of topic, being threat, error or focus)*	*Desired outcome (includes performance criteria OR training outcome)*	*Guidance material (GM) Example scenario elements*	*PRO*	*COM*	*FPA*	*FPM*	*LTW*	*PSD*	*SAW*	*WLM*	*KNO*
Section 7 — UPRT Upset recovery training topic with frequency (C). Evaluation phase, manoeuvres training phase or scenario-based training phase (EVAL, MT or SBT)														
MT or SBT	Upset recovery	C	N/A	Compliance with AMC1 or AMC2 to ORO.FC.220&230 Include the recovery exercises in Table 2 of AMC1 ORO.FC.220&230 for the recurrent training programme, such that all the exercises are covered over a period not exceeding 3 years. According to the principles of EBT, covering one component should satisfy the requirement to cover the whole element of recovery from developed upsets. The same principles apply to the exercises of components 2, 3 and 4 where one exercise may satisfy the requirement to cover the whole component. An aeroplane upset is defined as an undesired aeroplane state in flight characterised by unintentional divergences from parameters normally experienced during line operations or training. An aeroplane upset may involve pitch and/or bank angle divergences as well as inappropriate airspeeds for the conditions.	Recognise upset condition. Make timely and appropriate intervention. Take appropriate action. Assure timely and appropriate intervention. (AMC1 ORO.FC.220&230 Table 2 component 1) Assure aircraft control. Maintain or restore a safe flight path. Assess consequential issues. Manage outcomes. Consolidate the summary of aeroplane recovery techniques. (AMC1 ORO.FC.220&230 Table 2 component 5) Note: The operator should assess if the exercises should be practised for the either seat qualification.	The example scenario elements may be done in ISI, as non-ISI or a combination of both. If done in ISI: The instructor should position the aircraft within but close to the edge of the validated training envelope before handing control to the trainee to demonstrate the restoration of normal flight. Careful consideration should be given to flying within the validated training envelope.	Intentionally blank								
			CLB DES		Table 2 of AMC1 ORO.FC.220&230: Exercises for upset recovery training									
					A. **Recovery from developed upsets**									
					2. Recovery from stall events in the following configurations: — take-off configuration, — clean configuration low altitude, — clean configuration near maximum operating altitude, and — landing configuration during the approach phase.	x			x			x	x	
			CRZ		3. Recovery from nose high at various bank angles	x			x			x	x	
			CRZ		4. Recovery from nose low at various bank angles	x			x			x	x	
			CRZ		Demonstration at a normal cruising altitude. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
			APP		Demonstration at an intermediate altitude during early stages of the approach. Set conditions and disable aircraft systems as necessary to enable trainee to perform stall recovery according to OEM instructions.	x			x			x		
			CLB DES		Recovery from a wake turbulence position with high-bank angle	x		x	x			x		

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
Section 8 — Training topics with frequency (C) in alphabetical order. Evaluation phase or scenario-based training phase (EVAL or SBT)															
EVAL or SBT	Adverse wind	C	TO	Adverse wind/crosswind. This includes tailwind but not ATC mis-reporting of the actual wind.	Recognise adverse-wind conditions. Observe limitations. Apply the appropriate procedures. Maintain directional control and safe flight path.	Take-off with different crosswind/tailwind/gust conditions						x		x	
			TO			Take-off with unreported tailwind		x			x				
			TO			Crosswinds with or without strong gusts on take-off	x			x					
			APP			Wind exceeding limits on final approach (not reported)	x	x				x	x		
			APP			Wind exceeding limits on final approach (reported) in manual aircraft control	x	x		x		x			
			APP			Increasing tailwind on final approach (not reported)	x	x				x	x		
			APP			Approach and landing in demanding weather conditions, e.g. turbulence, up and downdrafts, gusts and crosswind including shifting wind directions				x		x	x		
			APP			Adverse-wind scenario resulting in increasing tailwind below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below DA (not reported)		x		x		x			
			APP			Adverse-wind scenario including strong gusts and/or crosswind out of limits below 15 m (50 ft) (not reported)		x		x		x			
			APP LDG			Crosswind with or without strong gusts on approach, final approach and landing (within and beyond limits)	x			x		x			
	Approach, visibility close to minimum	C	APP	Any situation where visibility becomes a threat	Recognise actual conditions. Observe aircraft and/or procedural limitations. Apply the appropriate procedures if applicable. Maintain directional control and safe flight path.	Approach in poor visibility	x		x	x				x	
			APP			Approach in poor visibility with deteriorations necessitating a decision to perform a go-around	x		x	x					
			LDG			Landing in poor visibility				x		x	x		
EVAL or SBT	ATC	C	ALL	ATC error. Omission, miscommunication, garbled, poor quality transmission. All these act as distractions to be managed by the crew. The scenarios should be combined, where possible, with others of the same or higher weighting, the principal reason being to create distractions.	Respond to communications appropriately. Recognise, clarify and resolve any ambiguities. Refuse or question unsafe instructions. Use standard phraseology whenever possible.	ATC role-play: the instructor provides scripted instructions, as a distraction to the crew	x	x			x				
			ALL			Controller error, provided by the instructor according to a defined scripted scenario	x	x				x	x		
			ALL			Frequency congestion, with multiple aircraft using the same frequency		x							
			APP			Destination temporarily closed					x	x	x	x	
			CRZ			Rescue and firefighting services (RFFS) level reduction at destination		x			x		x		
			APP			Runway change before the interception of the localiser or similar navigation aid in azimuth			x		x		x	x	
			GND/ TO			Stray dogs at the opposite threshold runway		x			x		x		
			ALL			Poor quality transmissions		x							
EVAL or SBT	Fire and smoke management	C	GND	This includes engine, electric, pneumatic, cargo fire, smoke or fumes.	Recognise fire, smoke or fumes Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	Fire in cargo or cabin/cockpit at gate	x	x				x		x	
			GND			Fire during taxi	x	x				x		x	X
			GND			Fire with no cockpit indication	x	x				x		x	X
			TO			Take-off low speed	x			x	x	x			X
			TO			Fire or smoke on take-off high speed below V1	x			x	x	x			
			TO			Fire or smoke on take-off high speed above V1	x				x	x			
			TO			Fire or smoke on Initial climb	x				x	x			
			CRZ			Cargo fire						x	x	x	
			APP			Engine fire in approach (extinguishable)		x				x			
			APP			Engine fire in approach (non-extinguishable)		x			x	x			
			CLB CRZ DES			Lithium battery fire in the cockpit or cabin compartment	x	x			x	x		x	
			APP			Flight deck or cabin fire		x			x	x			X
			GND			Any of the example scenario elements above ending in an evacuation		x			x	x		x	

Assessment and training topic		Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Loss of communications	C	GND	Lost or difficult communications due to either pilot mis-selection or a failure external to the aircraft. This could be for a few seconds or a total loss.	Recognise loss of communications. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative ways to communicate. Manage consequences.	Loss of communications during ground manoeuvring	x	x							
			TO			Loss of communications after take-off	x					x			x
			APP			Loss of communications during approach phase, including go-around	x	x				x	x		x
EVAL or SBT	Managing loading, fuel, performance errors	C	ALL	A calculation error by one or more pilots, or someone involved with the process, or the process itself, e.g. incorrect information on the load sheet	Anticipate the potential for errors in load/fuel/performance data. Recognise inconsistencies. Manage/avoid distractions. Make changes to paperwork/aircraft system(s) to eliminate error. Identify and manage consequences.	This can be a demonstrated error, in that the crew may be instructed to deliberately insert incorrect data — for example, to take off from an intersection with full-length performance information. The crew will be asked to intervene when acceleration is sensed to be lower than normal, and this may be part of the operator procedures, especially when operating mixed fleets with considerable variations in MTOM.	x	x						x	
			GND			Fuel ground staff on industrial action. Only limited amount of fuel available, which is below the calculated fuel for the flight.					x	x	x	x	
			GND			Advise crew that there is a change of the load sheet figures during taxi to the runway. The crew may have limited time due to a calculated take-off time (CTOT) — ATC slot.	x							x	
			GND			Braking action reported 'medium'. The information is transmitted just before take-off. The flight is subject to a calculated take-off time (CTOT) — ATC slot.					x		x	x	
EVAL or SBT	Navigation	C	GND	External NAV failure. Loss of GPS satellite, ANP exceeding RNP, loss of external NAV source(s)	Recognise a NAV degradation. Take appropriate action. Execute the appropriate procedure as applicable. Use alternative NAV guidance. Manage consequences.	External failure or a combination of external failures degrading aircraft navigation performance on ground	x		x			x	x		
			TO CLB APP LDG			External failure or a combination of external failures degrading aircraft navigation performance in flight		x			x	x	x		
			GND			Standard initial departure change during taxi. The flight may be subject to a CTOT — ATC slot.					x		x	x	
			APP			Loss of runway lighting below decision height		x				x	x		
			CRZ			No fly zone: when the crew changes control frequency, the new ATCO informs the crew that they are flying over an unannounced 'no fly zone' that is not included in the NOTAMs. (To trigger such an event, the context may be as follows: an unexpected military conflict in the territory the aircraft is flying over or the crew is forced to re-route in flight and the new route flies over a city that has an important event such the Olympic games, a G20/G7 submit, or the route is flying near a space rocket launch close to the time of the launch, like the Guiana Space Centre, Cape Cañaveral, etc.).					x	x	x		
	Operations- or type-specific	C	ALL	Intentionally blank	Intentionally blank	Intentionally blank	Intentionally blank								
	Operations of special airport approval	C	APP LDG	See equivalency of approaches relevant to operations.	The operator should comply with the national qualification requirements published in the aeronautical information publication (AIP).	Intentionally blank	Intentionally blank								

	Assessment and training topic	Frequency	Flight phase activation	Description (includes type of topic, being threat, error or focus)	Desired outcome (includes performance criteria OR training outcome)	Guidance material (GM) Example scenario elements	PRO	COM	FPA	FPM	LTW	PSD	SAW	WLM	KNO
EVAL or SBT	Pilot incapacitation	C	TO	Consequences for the non-incapacitated pilot	Recognise incapacitation. Take appropriate action including correct stop/go decision. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	During take-off	x	x			x	x			X
			APP			During approach	x			x				x	X
EVAL or SBT	Runway or taxiway condition	C	GND TO LDG	Contamination or surface quality of the runway, taxiway, or tarmac including foreign objects	Recognise hazardous runway condition. Observe limitations. Take appropriate action. Apply the appropriate procedures correctly. Assure aircraft control.	Planned anticipated hazardous conditions with dispatch information provided to facilitate planning and execution of appropriate procedures						x			X
			GND TO LDG			Unanticipated hazardous conditions, e.g. unexpected heavy rain resulting in flooded runway surface		x			x	x			
			TO			Take-off on runway with reduced cleared width due to snow	x			x	x		x		
			TO			Stop/go decision in hazardous conditions					x	x		x	
EVAL or SBT	Traffic	C	CLB CRZ DES	Traffic conflict. ACAS RA or TA, or visual observation of conflict, which requires evasive manoeuvring	Anticipate potential loss of separation. Recognise loss of separation. Take appropriate action. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	ACAS warning that requires crew intervention		x				x	x	x	
	Wind shear recovery	C	TO	With or without warnings including predictive. A wind shear scenario is ideally combined with an adverse-weather scenario containing other elements.	Anticipate potential for wind shear. Avoid known wind shear or prepare for suspected wind shear. Recognise wind shear encounter. Take appropriate action. Apply the appropriate procedure correctly. Assure aircraft control. Recognise out of wind shear condition. Maintain or restore a safe flight path. Assess consequential issues and manage outcomes.	Predictive wind shear warning during take-off					x	x				
			TO			Wind shear encounter during take-off	x				x	x			
			TO			Wind shear encounter after rotation						x		x	
			TO			Predictive wind shear after rotation					x	x			
			APP			Predictive wind shear during approach	x				x	x			
			APP			Wind shear encounter during go-around	x				x	x		x	
			APP			Wind shear encounter during approach	x				x	x			

END GEN2 TURBOPROP

AMC7 ORO.FC232 EBT programme assessment and training topics

GENERATION 1 (JET) — EBT PROGRAMME — TABLE OF ASSESSMENT AND TRAINING TOPICS

Given the very small number of turbo-jet aeroplanes of the first generation in current use in commercial air transport operations and the lack of appropriate FSTDs for recurrent training, it has not been deemed possible to provide a table of assessment and training topics for those aeroplanes and therefore it is not possible to apply EBT.

AMC8 ORO.FC.232 EBT programme assessment and training topics

SCENARIO ELEMENTS AND COMPETENCY MAPPING

(a) The operator may develop scenario elements and a competency map that are more relevant to its operation.

(b) When developing scenario elements, the operator should ensure that there can be no negative training when asking pilots to induce their own errors.

(c) Competencies mapped are those considered critical in managing the scenario. They are determined according to the following principles:

(1) those competencies considered most critical to the successful management of the defined threat or error; or

(2) those competencies most likely to be linked to the root cause of poor performance in the case of unsuccessful management of a defined threat or error.

(d) The competency map may indicate scenarios or combinations of scenarios for development of particular competencies.

(e) The competency map indicates the most critical competencies suggested by design, but the instructor should always assess all observed competencies.

GM1 ORO.FC.232 EBT programme assessment and training topics

TABLE OF ASSESSMENT AND TRAINING TOPICS

(a) The assessment and training topics usually have several example scenario elements. At least one example scenario element is selected (e.g. Gen 4 topic 'Go-around' in MT has three example scenario elements — the operator may choose one at each module (frequency A)).

(b) Flight phase for activation:

Abbreviation	*Flight phase*	*Description*
GND (1)	Flight planning, preflight, engine start & taxi-out	Ground phases up to when the crew increases thrust for taking-off
	Taxi-in, engine shutdown, post-flight & flight closing	From the speed that permits the aircraft to be manoeuvred by means of taxiing for arriving at a parking area until the crew completes post-flight and flight closing duties.
TO (2)	Take-off	This phase begins when the crew increases the thrust for taking-off. It ends after the speed and configuration are established at a defined manoeuvring altitude or to continue the climb for cruise.
CLB (3)	Climb	This phase begins when the crew establishes the aircraft at a defined speed and configuration enabling the aircraft to increase altitude for the purpose of cruise. It ends with the aircraft established at a predetermined constant

Abbreviation	*Flight phase*	*Description*
		initial cruise altitude at a defined speed.
CRZ (4)	Cruise	The cruise phase begins when the crew establishes the aircraft at a defined speed and predetermined constant initial cruise altitude and proceeds in the direction of a destination. It ends with the beginning of descent for an approach.
DES (5)	Descent	This phase begins when the crew departs the cruise altitude for an approach at a particular destination. It ends when the crew initiates changes in aircraft configuration and/or speed to facilitate a landing on a particular runway.
APP (6)	Approach	This phase begins when the crew initiates changes in aircraft configuration and/or speeds enabling the aircraft to manoeuvre for landing on a particular runway. It ends when the aircraft is in the landing configuration and the crew is dedicated to land on a specific runway. It also includes go-around where the crew aborts the descent to the planned landing runway during the approach phase. Go-around ends after speed and configuration are established at a defined manoeuvring altitude or to continue the climb for cruise.
LDG (7)	Landing	This phase begins when the aircraft is in the landing configuration and the crew is dedicated to touchdown on a specific runway. It ends when the speed permits the aircraft to be manoeuvred by means of taxiing for arrival at a parking area.
ALL (8)	All	Any or all phases of flight

GM2 ORO.FC.232 EBT programme assessment and training topics

COMPETENCY MAP PROCESS

Note 1. The competency map process may be done in teams of instructors. Then the results are compared and reconciled by a small group of subject matter experts (SMEs).

Note 2. It is always easy to map SAW or KNO as the underlying competency, but there are almost invariably other competencies, especially when there is ineffective management, so the intent should be to balance the mapping of SAW or KNO and map the other predominant competencies within the scenario.

AMC1 ORO.FC.232(b)(1) EBT programme assessment and training topics

EBT DATA REPORT

(a) The data report is a large-scale comprehensive study of operational data. It identifies the areas of pilot training for improvement, providing the prioritisation of germane and relevant training topics to guide in the construction of suitable EBT programmes. The data report uses other studies, a variety of data sources and/or varied methodology to mitigate the inherent bias associated with individual types of data sources.

(b) The data report should:

(1) be endorsed or developed by the competent authority, EASA or ICAO;

(2) be reviewed by a team of experts in pilot training, representing airline operators, pilot associations, regulators, and original equipment manufacturers (OEM);

(3) use data or information (training data, operational data and safety data) from the following sources:

(i) accident investigation bodies;

(ii) competent authorities;

(iii) OEM — aircraft;

(iv) EASA safety information;

(v) operators; and

(vi) studies or reports (aviation or scientific);

(4) analyse the data with the following objectives:

(i) to substantiate the need for change in the assessment and training programmes for commercial transport pilots;

(ii) to provide evidence from data analyses to support the derivation of training topics, prioritised according to aircraft generation;

(iii) to challenge and/or corroborate the other sources of data (e.g. Training Criticality Survey and Training Guidance) with operational data;

(iv) to provide feedback regarding the effectiveness of changes implemented through the adoption of competency-based training methodologies; and

(v) to validate or ascertain practices, findings or conclusions made previously by the industry;

(5) include the studies and define the use of such studies in the data report following the criteria below:

(i) The study is relevant from a training perspective (e.g. if incorporating a training change mitigates the risk found in the study).

(ii) There is evidence that it will assist with the identification of competencies to be

developed in training in order to mitigate risks encountered in the evolving operational environment.

(iii) The findings of the study will be corroborative or challenging across the spectrum of the analysis made in the data report.

(iv) The study allows the analysis and comparison of the data or findings in the data report and it is coming from industry-respected research or studies;

(6) include an evidence table for the purpose of:

(i) integrating the evidence of the analyses in points (4) and (5);

(ii) identifying meaningful patterns;

(iii) enabling the grouping of evidence to support the key findings; and

(iv) facilitating the prioritisation of results; and

(7) include a prioritisation of the training topics for the purpose of translating data into useful events and scenarios to assess and develop pilot performance (assessment and training topics). The prioritisation shall:

(i) systematically rank threats, errors and competencies along with the factors leading to accidents and serious incidents from multiple data sources to formulate a table of assessment and training topics;

(ii) be performed for each of the generations of aircraft. This allows highlighting the differences and commonalities between generations; and

(iii) ensure sufficient flexibility in the process to allow enhancement of the training programmes according to the type of operation, culture and type of aircraft.

AMC1 ORO.FC.232(b)(3) EBT programme assessment and training topics

AIRCRAFT TYPES BY GENERATIONS

The operator should only develop an EBT programme for aircraft types for which there is a table of assessment and training topics.

Generation 4 — Jet)	From 1988. EFIS cockpit — FMS equipped FADEC Fly-by-wire control systems Advanced flight envelope protection Integrated auto flight control system — navigation performance, and terrain avoidance systems Generation fatal accident average rate: 0,1/million flights	A318/A319/A320/A321 (including neo), A330, A340-200/300, A340-500/600, B777, A380, B787, A350, Bombardier C Series (A220), Embraer E170/E175/E190/E195
Generation 3 — Jet	From 1969 EFIS cockpit — FMS equipped FADEC	A310/A300-600, B737-300/400/500, B737-600/700/800 (NG), B737 MAX, B757, B767, B747-400, B747-8, B717, BAE

	Integrated auto flight control system — navigation performance, and terrain avoidance systems Basic flight envelope protection — stick shaker/pusher Generation fatal accident average rate: 0,2/million flights	146, MD11, MD80, MD90, F70, F100, Bombardier CRJ Series, Embraer ERJ 135/145
Generation 3 — Turboprop	From 1992 EFIS cockpit — FMS equipped EEC/ECU or higher engine control Integrated auto flight control system — navigation performance and terrain avoidance systems Basic flight envelope protection — stick shaker/pusher	ATR 42-600, ATR 72-600, Bombardier Dash 8-400, BAE ATP, Saab 2000
Generation 2 — Jet	From 1964. Integrated auto-flight system. EEC/ECU or higher engine control Analogue/CRT instrument display Basic flight envelope protection — stick shaker/pusher Generation fatal accident average rate: 0,7/million flights	A300 (except A300-600), BAC111, B727, B737-100/200, B747-100/200/300, DC9, DC10, F28, L1011
Generation 2 — Turboprop	From 1964 Analogue/CRT instrument display EEC/ECU Basic flight envelope protection — stick shaker/pusher Integrated auto flight control system	ATR 42, ATR 72 (all series except -600), BAE J-41, Fokker F27/50, Bombardier Dash 7 and Dash 8-100/200/300 Series, Convair 580-600 Series, Shorts 330 and 360, Saab 340, Embraer 120
Generation 1 — Jet	From 1952 First commercial jets. Manual engine control Analogue instrument display Not integrated auto flight control system Basic flight envelope protection — stick shaker/pusher, attitude warning Generation fatal accident average rate: 3.0/million flights	DC8, B707

AMC1 ORO.FC.240 Operation on more than one type or variant

GENERAL

(a) Aeroplanes

(1) When a flight crew member operates more than one aeroplane class, type or variant, as determined by the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for class-single pilot or type-single pilot, but not within a single licence endorsement, the operator should ensure that the flight crew member does not operate more than:

(i) three reciprocating engine aeroplane types or variants;

(ii) three turbo-propeller aeroplane types or variants;

(iii) one turbo-propeller aeroplane type or variant and one reciprocating engine aeroplane type or variant; or

(iv) one turbo-propeller aeroplane type or variant and any aeroplane within a particular class.

(2) When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsement, as determined by the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012, the operator should ensure that:

(i) the minimum flight crew complement specified in the operations manual is the same for each type or variant to be operated;

(ii) the flight crew member does not operate more than two aeroplane types or variants for which a separate licence endorsement is required, unless credits related to the training, checking, and recent experience requirements are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for the relevant types or variants; and

(iii) only aeroplanes within one licence endorsement are flown in any one flight duty period, unless the operator has established procedures to ensure adequate time for preparation.

(3) When a flight crew member operates more than one aeroplane type or variant as determined by the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for type-single pilot and type-multi pilot, but not within a single licence endorsement, the operator should comply with points (a)(2) and (4).

(4) When a flight crew member operates more than one aeroplane type or variant as determined by the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for type multi-pilot, but not within a single licence endorsement, or combinations of aeroplane types or variants as determined by the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for class single-pilot and type multi-pilot, the operator should comply with the following:

(i) point (a)(2);

(ii) before exercising the privileges of more than one licence endorsement:

(A) flight crew members should have completed two consecutive ~~operator proficiency checks~~ OPCs and should have:

— 500 hours in the relevant crew position in CAT operations with the same operator; or

— for IFR and VFR night operations with performance class B aeroplanes, 100 hours or flight sectors in the relevant crew position in CAT operations with the same operator, if at least one licence endorsement is related to a class. A check flight should be completed before the pilot is released for duties as commander;

(B) in the case of a pilot having experience with an operator and exercising the privileges of more than one licence endorsement, and then being promoted to command with the same operator on one of those types, the required minimum experience as commander is 6 months and 300 hours, and the pilot should have completed two consecutive ~~operator proficiency checks~~ OPCs before again being eligible to exercise more than one licence endorsement;

(iii) before commencing training for and operation of another type or variant, flight crew members should have completed 3 months and 150 hours flying on the base aeroplane, which should include at least one proficiency check, unless credits related to the training, checking and recent experience requirements are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for the relevant types or variants;

(iv) after completion of the initial line check on the new type, 50 hours flying or 20 sectors should be achieved solely on aeroplanes of the new type rating, unless credits related to the training, checking and recent experience requirements are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for the relevant types or variants;

(v) recent experience requirements established in Commission Regulation (EU) No 1178/2011 for each type operated;

(vi) the period within which line flying experience is required on each type should be specified in the operations manual;

(vii) when credits are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for the relevant type or variant, this should be reflected in the training required in ORO.FC.230 and:

(A) ORO.FC.230 (b) requires two ~~operator proficiency checks~~ OPCs every year. When credits are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for ~~operator proficiency checks~~ OPCs to alternate between the types, each ~~operator proficiency check~~ OPC should revalidate the ~~operator proficiency check~~ OPC for the other type(s). The ~~operator proficiency check~~ OPC may be combined with the proficiency checks for revalidation or renewal of the aeroplane type rating or the instrument rating in accordance with Commission Regulation (EU) No 1178/2011. For EBT programmes, ORO.FC.231(a)(3) requires the pilot to complete a minimum of two modules of the EBT programme, separated by a period of more than 3 months, within a 12-month period. In addition, the pilot is required to be trained according to assessment and training topics distributed across a 3-year period at the defined frequency relevant to the type or variant of aircraft. When credits are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012, EBT modules should alternate between types. The EBT modules may be combined for revalidation or renewal of the

aeroplane type rating or the instrument rating in accordance with Commission Regulation (EU) No 1178/2011. When operating more than one type of different generations, the operator has to fulfil both generation table of assessment and training topics as per ORO.FC.232.

(B) ORO.FC.230 (c) requires one line check every year. When credits are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for line checks to alternate between types or variants, each line check should revalidate the line check for the other type or variant. For EBT programmes, ORO.FC.231(h) requires one line evaluation of competence every year. When credits are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012 for line evaluation of competence to alternate between types or variants, each line evaluation of competence should revalidate the line evaluation of competence for the other type or variant. In such case, the operator should meet the requirements to extend the validity of the line evaluation of competence to 2 years. Extension to 3 years should not be allowed.

(C) Annual emergency and safety equipment training and checking should cover all requirements for each type.

(b) Helicopters […]