Brunei Department of Civil Aviation

Brunei Darussalam

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Brunei Aviation Requirements

BAR 6 Part ORO Organisational Requirements for Air Operators – Acceptable Means of Compliance and Guidance Material

NOTES

The content of this document is arranged as follows: The acceptable means of compliance (AMC) followed by the related and guidance material (GM) paragraph(s).
In case of certification specifications (CS), a CS paragraph is followed by the related GM paragraph.

All elements (i.e. AMC, CS, and GM) are colour-coded and can be identified according to the illustration below.

Acceptable Means of Compliance

Certification Specifications

Guidance Materials

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Control of this Document

DC.1 Introduction

DC.1.1 Pursuant to Civil Aviation Order 2006 and the Civil Aviation Regulations 2006 and their subsequent amendments, the following requirements are hereby established for compliance by all persons concerned, the Director of Civil Aviation is empowered to adopt and amend Brunei Aviation Requirements. In accordance herewith, the following requirement is hereby established for compliance by all persons concerned. This requirement shall be known as BAR 6 Part ORO Organisational Requirements for Air Operators – Acceptable Means of Compliance and Guidance Material and any reference to this title shall mean referring to the requirements to be met for civil aviation in Brunei Darussalam

DC.2 Authority for this Requirement

DC.2.1 This BAR 6 Part ORO Organisational Requirements for Air Operators – Acceptable Means of Compliance and Guidance Material is issued on the authority of the Director of Civil Aviation.

DC.3 Applicability

DC.3.1 This BAR 6 Part ORO Organisational Requirements for Air Operators – Acceptable Means of Compliance and Guidance Material is applicable to the aviation industry of Brunei Darussalam.

DC.4 Scope

DC.4.1 BAR 6 Operation of Aircraft contains the operation of aircraft requirements of Brunei Darussalam, and shows compliance with ICAO Annex 6. The requirements in BAR 6 are separated into the following parts with cross references between parts where applicable.

Part Air Operations Cover Requirement

Part ARO Authority Requirements for Air Operations

Part ORO Organisation Requirements for Air Operations

Part DEF Definitions

Part CAT Commercial Air Transport

Part SPA Specific Approvals

Part SPO Special Operations

Part NCC Non Commercial with Complex Motor-Powered Aircraft

Part NCO Non Commercial other than Complex Motor-Powered Aircraft

DC.5 Definitions

DC.5.1 Terms not defined shall have the meaning given to them in the relevant legal instruments or international legal instruments in which they appear, especially as they appear in the Convention and its Annexes.

Amendment

Amendment Number	Date of Issue	Remarks
V01	1st February 2017	Initial Issue
V02	1st February 2018	First Amendment
V03	1st May 2018	Second Amendment
V04	1st May 2019	Third Amendment
V05	1st December 2019	Fourth Amendment
V06	1st December 2022	Fifth Amendment

Part ORO - Organisation Requirements for Air Operations

Subpart GEN General Requirements

Section 1 - General

AMC1 ORO.GEN.110(a) Operator responsibilities

SECURITY TRAINING PROGRAMME FOR CREW MEMBERS — CAT OPERATIONS

The Commercial Air Transport (CAT) operator should establish and maintain a security training programme for crew members, including theoretical and practical elements. This training should be provided at the time of operator conversion training and thereafter at intervals not exceeding three years. The content and duration of the training should be adapted to the security threats of the individual operator and should ensure that crew members act in the most appropriate manner to minimise the consequences of acts of unlawful interference. This programme should include the following elements:

(a) determination of the seriousness of the occurrence;

(b) crew communication and coordination;

(c) appropriate self-defence responses;

(d) use of non-lethal protective devices assigned to crew members whose use is authorised by the Brunei Darussalam;

(e) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;

(f) in case where cabin crew are required, live situational training exercises regarding various threat conditions;

(g) flight crew compartment procedures to protect the aircraft;

(h) aircraft search procedures, including identification of prohibited articles; and

(i) guidance on the least risk bomb locations.

AMC2 ORO.GEN.110(a) Operator responsibilities

Security Training Programme for Ground Personnel – CAT Operations

The CAT operator should establish and maintain a security training programme for ground personnel to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

GM1 ORO.GEN.110(a) Operator responsibilities

SECURITY TRAINING PROGRAMME FOR CREW MEMBERS

ICAO Security Manual Doc 9811 (restricted access) contains guidance on the development of training programmes.

AMC1 ORO.GEN.110(c) Operator responsibilities

OPERATIONAL CONTROL

The organisation and methods established to exercise operational control should be included in the operations manual and should cover at least a description of responsibilities concerning the initiation, continuation and termination or diversion of each flight.

GM1 ORO.GEN.110(c) Operator responsibilities

OPERATIONAL CONTROL

(a) Point ORO.GEN.110 (c) does not imply a requirement for licensed flight operations officers/ flight dispatchers.

(b) If the operator uses flight operations officers (FOOs)/flight dispatchers (FDs) in conjunction with a method of operational control, training for that personnel should be based on the relevant parts of ICAO Annex 1 and ICAO Documents 10106 and 9868. This training should be described in the OM.

AMC1 ORO.GEN.110(e) Operator responsibilities

MEL TRAINING PROGRAMME

(a) The operator should develop a training programme for ground personnel dealing with the use of the MEL and detail such training in the continuing airworthiness maintenance exposition CAME and OM as appropriate. Such training programme should include:

(1) the scope, extent and use of the MEL;

(2) placarding of inoperative equipment;

(3) deferral procedures;

(4) dispatching; and

(5) any other operator's MEL related procedures.

(b) The operator should develop a training programme for crew members and detail such training in the Operations Manual. Such training programme should include:

(1) the scope, extent and use of the MEL;

(2) the operator's MEL procedures;

(3) elementary maintenance procedures where permitted for flight crew; and

(4) pilot-in-command/commander responsibilities.

AMC2 ORO.GEN.110(e) Operator responsibilities

GROUND OPERATIONS WITH PASSENGERS ON BOARD IN THE ABSENCE OF FLIGHT CREW

For ground operations, whenever passengers are embarking, on board or disembarking in the absence of flight crew members, the operator should:

(a) establish procedures to alert the aerodrome services in the event of ground emergency or urgent need; and

(b) ensure that at least one person on board the aircraft is qualified to apply these procedures and ensure proper coordination between the aircraft and the aerodrome services.

GM1 ORO.GEN.110(e) Operator responsibilities

GROUND PERSONNEL

For the purpose of the MEL training programme referred to in AMC1 ORO.GEN.110 (e) ground personnel include maintenance personnel, flight dispatchers and operations officers.

GM2 ORO.GEN.110(e) Operator responsibilities

AERODROME SERVICES

Aerodrome services refer to units available at an aerodrome that could be of assistance in responding to an urgent need or an emergency, such as rescue and fire fighting services, medical and ambulance services, air traffic services, security services, police, aerodrome operations, air operators.

AMC1 ORO.GEN.110(c)&(e) Operator responsibilities

PERSONNEL RESPONSIBILITIES — OPERATIONAL CONTROL PERSONNEL THAT PERFORM TASKS RELATED TO FLIGHT MONITORING AND FLIGHT WATCH — TRAINING PROGRAMME

(a) When a CAT operator uses flight monitoring or flight watch as functions of a system for exercising operational control, FOOs/FDs should perform those functions.

(b) The CAT operator should develop a training programme, based on the relevant parts of ICAO Annex 1, ICAO Documents 10106 and 9868, for FOOs/FDs that perform those functions.

(c) The training programme specified above should be detailed in the OM of the CAT operator and should be delivered by an instructor for operational control personnel.

INITIAL TRAINING

(d) The initial training should include, where relevant to the intended operation, the following elements that should be tailored to the specific duties assigned to each person:
  (1) air law:
  rules and regulations relevant to the task assignment, appropriate ATS practices and procedures;
  (2) aircraft general knowledge:
    (i) principles of operation of aeroplane engines/systems/instruments;
    (ii) operating limitations of aeroplanes and engines; and
    (iii) MEL and configuration deviation list (CDL);
  (3) flight performance calculation, planning procedures, and loading:
    (i) effects of loading and mass distribution on aircraft performance and flight characteristics; mass and balance calculations;

(ii) operational flight planning; fuel consumption and endurance calculations; alternate aerodrome selection procedures; en-route cruising control; extended range operation;
(iii) preparation and filing of ATS flight plans; and
(iv) basic principles of computer-assisted planning systems;

(4) human performance: human performance related to operational control duties, including principles of threat and error management (TEM); guidance material on how to design training programmes on human performance, including on TEM, is provided in ICAO Doc 9683 Human Factors Training Manual;
(5) meteorology:
(A) aeronautical meteorology; movement of pressure systems; structure of fronts; origin and characteristics of significant weather phenomena that affect take-off, en-route, and landing conditions;
(B) interpretation and application of aeronautical meteorological reports, charts, and forecasts; codes and abbreviations; use of, and procedures for, obtaining meteorological information;
(C) effects of meteorological conditions on aircraft operation and on radio reception in the aircraft that is used by the operator; and
(D) all-weather operations;
(6) navigation:
(A) principles of air navigation with particular reference to IFR; and
(B) navigation and radio equipment in the aircraft that is used by the operator;
(7) operational procedures:
(A) use of aeronautical documentation and SOPs;
(B) procedures for operations beyond 60 minutes from an adequate aerodrome, including, if applicable, extended-diversion-time operations (EDTOs);
(C) operational procedures for the carriage of cargo and dangerous goods;
(D) de-icing/anti-icing;
(E) procedures related to aircraft accidents and incidents; emergency flight procedures; and
(F) security procedures related to unlawful interference and sabotage of aircraft;
(8) principles of flight:
principles of flight related to the appropriate category of aircraft;
(9) radio communications:
procedures for communicating with other aircraft and ground stations; and
(10) special aerodromes.

OPERATOR-SPECIFIC TRAINING

(e) In addition to the initial training, FOOs/FDs should receive training in the specific duties, responsibilities, and tools that are associated with the operational control system of the operator.

RECURRENT TRAINING

(f) When the recurrent training is conducted within the last 12 months of a 36-month validity period, the next 36-month validity period should be calculated from the original expiry date of the previous assessment.
(g) Notwithstanding the 36-month interval of point (f), recurrent training may also be performed at shorter intervals and adjusted to the needs identified after an assessment of the training needs conducted by the operator.

KNOWLEDGE, SKILLS, AND QUALIFICATIONS FOR INSTRUCTORS OF OPERATIONAL cONTROL PERSONNEL

(h) Unless otherwise required by the relevant national regulations, instructors for operational control personnel should:
(1) be able to prove that they are current in the subjects covered by the training programme for FOOs/FDs, including the operator-specific elements, or otherwise successfully complete an FOO/FD training programme;
(2) have adequate instructional skills or attend instructor training; if more than 24 months have passed since the delivery of the last FOO/FD course, they should attend recurrent instructor training before delivering the next course; and
(3) have relevant work experience in the areas of the training that they provide. (i) The CAT operator should include in the OM the required knowledge, skills, and qualifications of the instructors for operational control personnel.

AMC1 ORO.GEN.110(f) Operator responsibilities

STERILE FLIGHT CREW COMPARTMENT

(a) Sterile flight crew compartment procedures should ensure that:

(1) flight crew activities are restricted to essential operational activities; and

(2) cabin crew and technical crew communications to flight crew or entry into the flight crew compartment are restricted to safety or security matters.

(b) The sterile flight crew compartment procedures should be applied:

(1) during critical phases of flight;

(2) during taxiing (aeroplanes);

(3) below 10 000 feet above the aerodrome of departure after take-off and the aerodrome of destination before landing, except for cruise flight; and

(4) during any other phases of flight as determined by the pilot-in-command or commander.

(c) All crew members should be trained on sterile flight crew compartment procedures established by the operator, as appropriate to their duties.

AMC2 ORO.GEN.110(f) Operator responsibilities

INSTRUCTIONS ABOUT DUTIES AND RESPONSIBILITIES OF PERSONNEL — BRIEFING OF FLIGHT OPERATIONS OFFICERS/FLIGHT DISPATCHERS BEFORE ASSUMING DUTIES

In the context of an ongoing flight-following, flight-monitoring, or flight-watch activity, an FOO/FD, before assuming duties, should be briefed on the elements related to the safety of the operations the FOO/FD will be performing as part of the operational control.

GM1 ORO.GEN.110(f) Operator responsibilities

STERILE FLIGHT CREW COMPARTMENT

(a) Establishment of procedures

The operator should establish procedures for flight, cabin, and technical crew that emphasise the objectives and importance of the sterile flight crew compartment. These procedures should also emphasise that, during periods of time when the sterile flight deck compartment procedures are applied, cabin crew and technical crew members should call the flight crew or enter the flight crew compartment only in cases related to safety or security matters. In such cases, information should be timely and accurate.

(b) Flight crew activities

When sterile flight crew compartment procedures are applied, flight crew members are focused on their essential operational activities without being disturbed by non-safety related matters. Examples of activities that should not be performed are:

(1) radio calls concerning passenger connections, fuel loads, catering, etc.;

(2) non-critical paperwork; and

(3) mass and balance corrections and performance calculations, unless required for safety reasons.

(c) Communication to the flight crew

Cabin crew and technical crew use their own discretion to determine whether the situation is related to safety or security matters and whether to call the flight crew. Situations requiring information to the flight crew may include:

(1) any outbreak of fire inside the cabin or in an engine;

(2) a burning smell in the cabin or presence of smoke inside or outside;

(3) fuel or fluid leakage;

(4) exit door unable to be armed or disarmed;

(5) localised extreme cabin temperature changes;

(6) evidence of airframe icing;

(7) cabin/galley equipment or furniture malfunction/breakage posing a hazard to the occupants;

(8) suspicious object;

(9) disruptive passenger;

(10) security threat;

(11) abnormal vibration or noise;

(12) medical emergency;

(13) general drop-down of the oxygen masks in the cabin; and

(14) any other condition deemed relevant by a cabin crew or technical crew member.

GM2 ORO.GEN.110(f) Operator responsibilities

ELEMENTS OF THE BRIEFING GIVEN TO FLIGHT OPERATIONS OFFICERS/FLIGHT DISPATCHERS BEFORE ASSUMING DUTIES

Before commencing their shift, the FOO/FD should be briefed on relevant safety information such as:

(a) weather charts;

(b) weather reports;

(c) NOTAMs;

(d) operational restrictions in force;

(e) flights in the air and flights for which operational flight plans have been issued but which have not yet started and for which the FOO/FD will be responsible;

(f) the forecast flight schedule; and

(g) other relevant safety information as listed in GM 28 Annex I 'Definitions for terms used in Annexes II to VIII'.

AMC1 ORO.GEN.110(f)(h) Operator responsibilities

ESTABLISHMENT OF PROCEDURES

(a) An operator should establish procedures to be followed by cabin crew covering at least:

(1) arming and disarming of slides;

(2) operation of cabin lights, including emergency lighting;

(3) prevention and detection of cabin, galley and toilet fires;

(4) actions to be taken when turbulence is encountered; and

(5) actions to be taken in the event of an emergency and/or an evacuation; and

(6) safety aspects of the in-flight entertainment (IFE) system, if installed

(b) When establishing procedures and a checklist system for cabin crew with respect to the aircraft cabin, the operator should take into account at least the following duties:

	Duties	Pre-take off	In-flight	Pre-landing	Post- landing
1.	Briefing of cabin crew by the senior cabin crew member prior to commencement of a flight or series of flights	x			
2.	Check of safety and emergency equipment in accordance with operator's policies and procedures	x			
3.	Security checks as applicable	x			x
4.	Passenger embarkation and disembarkation	x			x
5.	Securing of passenger cabin (e.g. seat belts, cabin cargo/baggage, IFE system)	x		x	
6.	Securing of galleys and stowage of equipment	x	if required	x	
7.	Arming of door/exit slides	x			
8.	Safety briefing/information to passengers	x	x	x	x
9.	'Cabin secure' report to flight crew	x	if required	x	
10.	Operation of cabin lights	x	if required	x	x
11.	Safety aspects of the IFE system (if installed)	x	If required	x	x

	Duties	Pre-take off	In-flight	Pre-landing	Post- landing
12.	Cabin crew at assigned crew stations	x	if required	x	x
13.	Surveillance of passenger cabin	x	x	x	x
14.	Prevention and detection of fire in the cabin (including the combi-cargo area, crew rest areas, galleys, lavatories and any other cabin remote areas) and instructions for actions to be taken	x	x	x	x
15.	Actions to be taken when turbulence is encountered		x		
16.	Actions to be taken in case of in- flight incidents (e.g. medical emergency)		x		
17.	Actions to be taken in the event of emergency situations	x	x	x	x
18.	Disarming of door/exit slides				x
19.	Reporting of any deficiency and/or un-serviceability of equipment and/or any incident	x	x	x	x

(c) The operator should specify the contents of safety briefings for all cabin crew members prior to the commencement of a flight or series of flights.

AMC1 ORO.GEN.120(a) Means of compliance

DEMONSTRATION OF COMPLIANCE

In order to demonstrate that the regulations are met, a risk assessment should be completed and documented. The result of this risk assessment should demonstrate that an equivalent level of safety to that established by the Acceptable Means of Compliance (AMC) adopted by the Brunei DCA is reached.

AMC1 ORO.GEN.125 Terms of approval and privileges of an AOC holder

MANAGEMENT SYSTEM DOCUMENTATION

The management system documentation should contain the privileges and detailed scope of activities for which the operator is certified, as relevant to the applicable requirements. The scope of activities defined in the management system documentation should be consistent with the terms of approval.

AMC1 ORO.GEN.130 Changes related to an AOC holder

APPLICATION TIME FRAMES

(a) The application for the amendment of an AOC should be submitted at least 30 days before the date of the intended changes.

(b) In the case of a planned change of a nominated person, in accordance with ORO.GEN.210(b) or of a safety manager as defined under AMC1 ORO.GEN.200(a)(1), the operator should inform the Brunei DCA at least 20 days before the date of the proposed change.

(c) Unforeseen changes should be notified at the earliest opportunity, in order to enable the Brunei DCA to determine continued compliance with the applicable requirements and to amend, if necessary, the AOC and related terms of approval.

AMC1 ORO.GEN.130(b) Changes related to an AOC holder

MANAGEMENT OF CHANGES REQUIRING PRIOR APPROVAL

For changes requiring prior approval, the operators should conduct a safety risk assessment and provide it to the Brunei DCA upon request.

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

GENERAL

(a) Typical examples of changes that may affect the AOC or the operations specifications or the operator's management system, as required in ORO.GEN.200 (a)(1) and (a)(2), are listed below:

(1) the name of the operator;

(2) a change of legal entity;

(3) the operator's principal place of business;

(4) the operator's scope of activities;

(5) additional locations of the operator;

(6) the accountable manager, referred to in ORO.GEN.210(a);

(7) reporting lines between the accountable manager and the nominated person;

(8) the operator's documentation, as required by this requirement, safety policy and procedures;

(9) the facilities.

(b) Prior approval by the Brunei DCA is required for any changes to the operator's procedure describing how changes not requiring prior approval will be managed and notified to the Brunei DCA.

(c) Changes requiring prior approval may only be implemented upon receipt of formal approval by the Brunei DCA.

GM2 ORO.GEN.130(a) Changes related to an AOC holder

CHANGE OF NAME

A change of name requires the operator to submit a new application as a matter of urgency.

Where this is the only change to report, the new application can be accompanied by a copy of the documentation previously submitted to the Brunei DCA under the previous name, as a means of demonstrating how the operator complies with the applicable requirements.

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

CHANGES REQUIRING PRIOR APPROVAL

The following list is a non-exhaustive checklist of items that require prior approval by the Brunei DCA as specified in the applicable regulations:

(a) alternative means of compliance;

(b) procedures regarding items to be notified to the Brunei DCA;

(c) cabin crew:

(1) conduct of the training, examination and checking required by Part-CC and issue of cabin crew attestations;

(2) procedures for cabin crew to operate on four aircraft types;

(3) training programmes, including syllabi;

(d) leasing agreements;

(e) procedure for the use of aircraft included in an AOC by other operators for NCC, NCO and specialised operations, as required by ORO.GEN.310;

(f) specific approvals in accordance with Part-SPA;

(g) dangerous goods training programmes;

(h) flight crew:

(1) alternative training and qualification programmes (ATQPs);

(2) procedures for flight crew to operate on more than one type or variant;

(3) training and checking programmes, including syllabi and use of flight simulation training devices (FSTDs);

(i) fuel schemes and special refuelling or defuelling of aeroplanes;

(j) helicopter operations:

(1) over a hostile environment located outside a congested area, unless the operator holds an approval to operate according to Subpart J *HELICOPTER EMERGENCY MEDICAL SERVICE OPERATIONS* of Annex V Part-SPA (SPA.HEMS);

(2) to/from a public interest site;

(3) without an assured safe forced landing capability; and

(4) during refuelling with rotors turning;

(k) mass and balance: standard masses for load items other than standard masses for passengers and checked baggage;

(l) minimum equipment list (MEL):

(1) MEL;

(2) operating other than in accordance with the MEL, but within the constraints of the master minimum equipment list (MMEL);

(3) rectification interval extension (RIE) procedures;

(m) minimum flight altitudes:

(1) the method for establishing minimum flight altitudes;

(2) descent procedures to fly below specified minimum altitudes;

(n) performance:

(1) increased bank angles at take-off (for performance class A aeroplanes);

(2) short landing operations (for performance class A and B aeroplanes);

(3) steep approach operations (for performance class A and B aeroplanes);

(4) reduced required landing distance operations (for performance class A and B aeroplanes);

(o) isolated aerodrome: using an isolated aerodrome as destination aerodrome for operations with aeroplanes;

(p) method used to establish aerodrome operating minima;

(q) approach flight technique:

(1) all approaches not flown as stabilised approaches for a particular approach to a particular runway;

(2) non-precision approaches not flown with the continuous descent final approach (CDFA) technique for each particular approach/runway combination;

(r) maximum distance from an adequate aerodrome for two-engined aeroplanes without an extended range operations with two-engined aeroplanes (ETOPS) approval:

(1) air operations with two-engined performance class A aeroplanes with a maximum operational passenger seating configuration (MOPSC) of 19 or less and a maximum take-off mass less than 45 360 kg, over a route that contains a point further than 120 minutes from an adequate aerodrome, under standard conditions in still air;

(s) aircraft categories:

(1) Applying a lower landing mass than the maximum certified landing mass for determining the indicated airspeed at threshold (VAT).

(t) commercial air transport operations with single-engined turbine aeroplanes in instrument meteorological conditions or at night (CAT SET-IMC).

AMC1 ORO.GEN.150(b) Findings

GENERAL

The corrective action plan defined by the operator should address the effects of the non- compliance, as well as its root cause.

GM1 ORO.GEN.150 Findings

GENERAL

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

(b) Corrective action is the action to eliminate or mitigate the root cause(s) and prevent recurrence of an existing detected non-compliance or other undesirable condition or situation. Proper determination of the root cause is crucial for defining effective corrective actions to prevent reoccurrence.

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

AMC1 ORO.GEN.160 Occurrence reporting

GENERAL

(a) The operator should report all occurrences defined in the Civil Aviation Regulations 2006, and as required by the applicable national rules on occurrence reporting in civil aviation.

(b) In addition to the reports required by the Civil Aviation Regulations 2006, the operator should report volcanic ash clouds encountered during flight.

AMC2 ORO.GEN.160 Occurrence reporting

REPORTABLE EVENTS OF PBN OPERATIONS

(a) A reportable event should be an event that adversely affects the safety of the operation and may be caused by actions or events external to the functioning of the aircraft navigation system.

(b) Technical defects and the exceedance of technical limitations, including:

  (1) significant navigation errors attributed to incorrect data or a database coding error;

  (2) unexpected deviations in lateral/vertical flight path not caused by flight crew input or erroneous operation of equipment;

  (3) significant misleading information without a failure warning;

  (4) total loss or multiple navigation equipment failure; and

  (5) loss of integrity, e.g. RAIM function, whereas integrity was predicted to be available during preflight planning,

  should be considered a reportable event.

(c) The operator should have in place a system for investigating a reportable event to determine if it is due to an improperly coded procedure or a navigation database error. The operator should initiate corrective actions for such an event.

AMC3 ORO.GEN.160 Occurrence reporting

REPORTABLE EVENTS OF LVOs

A reportable event should include:

(a) significant deviations from the flight path not caused by flight crew input;

(b) misleading information without flight deck alerts;

(c) loss of airborne navigation equipment functions necessary for the operation;

(d) loss of functions or facilities at the aerodrome necessary for the operation, including aerodrome operating procedures, ATC operation, navigation facilities, visual aids and electrical power supply;

(e) loss of other functions related to external infrastructure necessary for the operation; and (6) any other event causing the approach or landing to be abandoned if occurring repeatedly. The reports should be submitted to the aerodrome involved when relevant and in addition to the recipients prescribed in ORO.GEN.160(b).

GM1 ORO.GEN.160 Occurrence reporting

REPORTABLE EVENTS OF LVOs — OTHER EVENTS OCCURRING REPEATEDLY

(a) The purpose of point (a)(6) of AMC3 ORO.GEN.160 is to share the information with aviation stakeholders other than the operator of the aircraft to identify yet unknown systemetic safety-related issues. The main focus is thus on a series of similar events rather that an isolated single event.

(b) Other events causing the approach or landing to be abandoned may include but are not limited to:

  (1) erroneous or inadequate flight crew action or aircraft handling; or

  (2) meteorological phenomena or human-made disturbances (e.g. road crossing final approach in an EFVS approach, laser strikes, etc.) or emissions from infrastructures (e.g. 5G) which require flight crews to take corrective action to an extent to which the LVO cannot be terminated successfully or completed as planned, leading to a go-around, a balked landing or an unplanned manual intervention by the pilot during the landing manoeuvre.

(c) Possible causes may be human-factor-related issues when employing newly introduced LVO equipment technologies or procedures or when changes take place in the runway environment or aerodrome vicinity.

Section 2 - Management

AMC1 ORO.GEN.200(a)(1);(2);(3);(5) management system

NON-COMPLEX OPERATORS — GENERAL

(a) Safety risk management may be performed using hazard checklists or similar risk management tools or processes, which are integrated into the activities of the operator.

(b) The operator should manage safety risks related to a change. The management of change should be a documented process to identify external and internal change that may have an adverse effect on safety. It should make use of the operator's existing hazard identification, risk assessment and mitigation processes.

(c) The operator should identify a person who fulfils the role of safety manager and who is responsible for coordinating the safety related processes and tasks. This person may be the accountable manager or a person with an operational role within the operator.

(d) Within the operator, responsibilities should be identified for hazard identification, risk assessment and mitigation.

(e) The safety policy should include a commitment to improve towards the highest safety standards, comply with all applicable legal requirements, meet all applicable standards, consider best practices and provide appropriate resources.

(f) The operator should, in cooperation with other stakeholders, develop, coordinate and maintain an emergency response plan (ERP) that ensures orderly and safe transition from normal to emergency operations and return to normal operations. The ERP should provide the actions to be taken by the operator or specified individuals in an emergency and reflect the size, nature and complexity of the activities performed by the operator.

AMC1 ORO.GEN.200(a)(1) Management system

COMPLEX OPERATORS — ORGANISATION AND ACCOUNTABILITIES

The management system of an operator should encompass safety by including a safety manager and a safety review board in the organisational structure.

(a) Safety manager

- (1) The safety manager should act as the focal point and be responsible for the development, administration and maintenance of an effective safety management system.
- (2) The functions of the safety manager should be to:
  - (i) facilitate hazard identification, risk analysis and management;
  - (ii) monitor the implementation of actions taken to mitigate risks, as listed in the safety action plan;
  - (iii) provide periodic reports on safety performance;
  - (iv) ensure maintenance of safety management documentation;
  - (v) ensure that there is safety management training available and that it meets acceptable standards;
  - (vi) provide advice on safety matters; and
  - (vii) ensure initiation and follow-up of internal occurrence/accident investigations.
- (3) If more than one person is designated for the safety management function, the accountable manager should identify the person who acts as the unique focal point (i.e. the 'safety manager')

(b) Safety review board

- (1) The safety review board should be a high level committee that considers matters of strategic safety in support of the accountable manager's safety accountability.
- (2) The board should be chaired by the accountable manager and be composed of heads of functional areas.
- (3) The safety review board should monitor:
  - (i) safety performance against the safety policy and objectives;
  - (ii) that any safety action is taken in a timely manner; and
  - (iii) the effectiveness of the operator's safety management processes.

(c) The safety review board should ensure that appropriate resources are allocated to achieve the established safety performance.

(d) The safety manager or any other relevant person may attend, as appropriate, safety review board meetings. He/she may communicate to the accountable manager all information, as necessary, to allow decision making based on safety data.

GM1 ORO.GEN.200(a)(1) Management system

SAFETY MANAGER

(a) Depending on the size of the operator and the nature and complexity of its activities, the safety manager may be assisted by additional safety personnel for the performance of all safety management related tasks.

(b) Regardless of the organisational set-up it is important that the safety manager remains the unique focal point as regards the development, administration and maintenance of the operator's safety management system.

COMPETENCIES OF THE SAFETY MANAGER

(c) The safety manager as defined under AMC1 ORO.GEN.200(a)(1) is expected to support, facilitate and lead the implementation and maintenance of the safety management system, fostering an organisational culture for an effective safety management, risk management and occurrence reporting. The competencies for a safety manager should thus include, but not be limited to, the following:

(1) Knowledge of:

(i) ICAO standards and European requirements and provisions on safety management;

(ii) basic safety investigation techniques; and

(iii) human factors in aviation.

(2) Relevant and documented work experience, preferably in a comparable position, in:

(i) management systems including compliance monitoring systems and safety management;

(ii) risk management; and

(iii) the operations of the organisation.

(3) Other suitable competencies

(i) the promotion of a positive safety culture;

(ii) interpersonal, influencing and leadership skills;

(iii) oral and written communication skills;

(iv) data management, analytical and problem-solving skills;

(v) professional integrity.

GM2 ORO.GEN.200(a)(1) Management system

COMPLEX OPERATORS — SAFETY ACTION GROUP

(a) A safety action group may be established as a standing group or as an ad-hoc group to assist or act on behalf of the safety review board.

(b) More than one safety action group may be established depending on the scope of the task and specific expertise required.

(c) The safety action group should report to and take strategic direction from the safety review board and should be comprised of managers, supervisors and personnel from operational areas.

(d) The safety action group should:

(1) monitor operational safety;

(2) define actions to mitigate the identified safety risks;

(3) assess the impact on safety of operational changes; and

(4) ensure that safety actions are implemented within agreed timescales.

(e) The safety action group should review the effectiveness of previous safety recommendations and safety promotion.

GM3 ORO.GEN.200(a)(1) Management system

MEANING OF THE TERMS 'ACCOUNTABILITY' AND 'RESPONSIBILITY'

In the English language, the notion of accountability is different from the notion of responsibility. Whereas 'accountability' refers to an obligation which cannot be delegated, 'responsibility' refers to an obligation that can be delegated

AMC1 ORO.GEN.200(a)(2) Management system

COMPLEX OPERATORS — SAFETY POLICY

(a) The safety policy should:

(1) be endorsed by the accountable manager;

(2) reflect organisational commitments regarding safety and its proactive and systematic management;

(3) be communicated, with visible endorsement, throughout the operator; and

(4) include safety reporting principles.

(b) The safety policy should include a commitment:

(1) to improve towards the highest safety standards;

(2) to comply with all applicable legislation, meet all applicable standards and consider best practices;

(3) to provide appropriate resources;

(4) to enforce safety as one primary responsibility of all managers; and

(5) not to blame someone for reporting something which would not have been otherwise detected.

(c) Senior management should:

(1) continually promote the safety policy to all personnel and demonstrate their commitment to it;

(2) provide necessary human and financial resources for its implementation; and

(3) establish safety objectives and performance standards.

GM1 ORO.GEN.200(a)(2) Management system

SAFETY POLICY

The safety policy is the means whereby the operator states its intention to maintain and, where practicable, improve safety levels in all its activities and to minimise its contribution to the risk of an aircraft accident as far as is reasonably practicable.

The safety policy should state that the purpose of safety reporting and internal investigations is to improve safety, not to apportion blame to individuals.

AMC1 ORO.GEN.200(a)(3) Management system

COMPLEX OPERATORS — SAFETY RISK MANAGEMENT

(a) Hazard identification processes

(1) Reactive and proactive schemes for hazard identification should be the formal means of collecting, recording, analysing, acting on and generating feedback about hazards and the associated risks that affect the safety of the operational activities of the operator.

(2) All reporting systems, including confidential reporting schemes, should include an effective feedback process.

(b) Risk assessment and mitigation processes

(1) A formal risk management process should be developed and maintained that ensures analysis (in terms of likelihood and severity of occurrence), assessment (in terms of tolerability) and control (in terms of mitigation) of risks to an acceptable level.

(2) The levels of management who have the authority to make decisions regarding the tolerability of safety risks, in accordance with (b)(1), should be specified.

(c) Internal safety investigation

(1) The scope of internal safety investigations should extend beyond the scope of occurrences required to be reported to the Brunei DCA.

(d) Safety performance monitoring and measurement

(1) Safety performance monitoring and measurement should be the process by which the safety performance of the operator is verified in comparison to the safety policy and objectives.

(2) This process should include:

(i) safety reporting, addressing also the status of compliance with the applicable requirements;

(ii) safety studies, that is, rather large analyses encompassing broad safety concerns;

(iii) safety reviews including trends reviews, which would be conducted during introduction and deployment of new technologies, change or implementation of procedures, or in situations of structural change in operations;

(iv) safety audits focussing on the integrity of the operator's management system, and periodically assessing the status of safety risk controls; and

(v) safety surveys, examining particular elements or procedures of a specific operation, such as problem areas or bottlenecks in daily operations, perceptions and opinions of operational personnel and areas of dissent or confusion.

(e) The management of change

The operator should manage safety risks related to a change. The management of change should be a documented process to identify external and internal change that may have an adverse effect on safety. It should make use of the operator's existing hazard identification, risk assessment and mitigation processes.

(f) Continuous improvement

The operator should continuously seek to improve its safety performance. Continuous improvement should be achieved through:

(1) proactive and reactive evaluations of facilities, equipment, documentation and procedures through safety audits and surveys;

(2) proactive evaluation of individuals' performance to verify the fulfilment of their safety responsibilities; and

(3) reactive evaluations in order to verify the effectiveness of the system for control and mitigation of risk.

(g) The emergency response plan (ERP)

(1) An ERP should be established that provides the actions to be taken by the operator or specified individuals in an emergency. The ERP should reflect the size, nature and complexity of the activities performed by the operator.

(2) The ERP should ensure:

(i) an orderly and safe transition from normal to emergency operations;

(ii) safe continuation of operations or return to normal operations as soon as practicable; and

(iii) coordination with the emergency response plans of other organisations, where appropriate.

GM1 ORO.GEN.200(a)(3) Management system

INTERNAL SAFETY REPORTING SCHEME

(a) The overall purpose of the internal safety reporting scheme is to use reported information to improve the level of the safety performance of the operator and not to attribute blame.

(b) The objectives of the scheme are to:

(1) enable an assessment to be made of the safety implications of each relevant incident and accident, including previous similar occurrences, so that any necessary action can be initiated; and

(2) ensure that knowledge of relevant incidents and accidents is disseminated, so that other persons and operators may learn from them.

(c) The scheme is an essential part of the overall monitoring function and it is complementary to the normal day-to-day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The scheme is a tool to identify those instances where routine procedures have failed.

(d) All occurrence reports judged reportable by the person submitting the report should be retained as the significance of such reports may only become obvious at a later date.

GM2 ORO.GEN.200(a)(3) Management system

RISK MANAGEMENT OF FLIGHT OPERATIONS WITH KNOWN OR FORECAST VOLCANIC ASH CONTAMINATION

(a) Responsibilities

The operator is responsible for the safety of its operations, including within an area with known or forecast volcanic ash contamination.

The operator should complete this assessment of safety risks related to known or forecast volcanic ash contamination as part of its management system before initiating operations into airspace forecast to be or aerodromes/operating sites known to be contaminated with volcanic ash.

This process is intended to ensure the operator takes account of the likely accuracy and quality of the information sources it uses in its management system and to demonstrate its own competence and capability to interpret data from different sources in order to achieve the necessary level of data integrity reliably and correctly resolve any conflicts among data sources that may arise.

In order to decide whether or not to operate into airspace forecast to be or aerodromes/operating sites known to be contaminated with volcanic ash, the operator should make use of the safety risk assessment within its management system, as required by ORO.GEN.200.

The operator's safety risk assessment should take into account all relevant data including data from the type certificate holders (TCHs) regarding the susceptibility of the aircraft they operate to volcanic cloud-related airworthiness effects, the nature and severity of these effects and the related pre-flight, in-flight and post-flight precautions to be observed by the operator.

The operator should ensure that personnel required to be familiar with the details of the safety risk assessments receives all relevant information (both pre-flight and in- flight) in order to be in a position to apply appropriate mitigation measures as specified by the safety risk assessments.

(b) Procedures

The operator should have documented procedures for the management of operations into airspace forecast to be or aerodromes/operating sites known to be contaminated with volcanic ash.

These procedures should ensure that, at all times, flight operations remain within the accepted safety boundaries as established through the management system allowing for any variations in information sources, equipment, operational experience or organisation. Procedures should include those for flight crew, flight planners, dispatchers, operations, continuing airworthiness personnel such that they are in a position to evaluate correctly the risk of flights into airspace forecast to be contaminated by volcanic ash and to plan accordingly.

Continuing airworthiness personnel should be provided with procedures allowing them to correctly assess the need for and to execute relevant continuing airworthiness interventions.

The operator should retain sufficient qualified and competent staff to generate well supported operational risk management decisions and ensure that its staff are appropriately trained and current. It is recommended that the operator make the necessary arrangements for its relevant staff to take up opportunities to be involved in volcanic ash exercises conducted in their areas of operation.

(c) Volcanic activity information and operator's potential response

Before and during operations, information valuable to the operator is generated by various volcano agencies worldwide. The operator's risk assessment and mitigating actions need to take account of, and respond appropriately to, the information likely to be available during each phase of the eruptive sequence from pre-eruption through to end of eruptive activity. It is nevertheless noted that eruptions rarely follow a deterministic pattern of behaviour. A typical operator's response may consist of the following:

(1) Pre-eruption

The operator should have in place a robust mechanism for ensuring that it is constantly vigilant for any alerts of pre-eruption volcanic activity relevant to its operations. The staff involved need to understand the threat to safe operations that such alerts represent.

An operator whose routes traverse large, active volcanic areas for which immediate International Airways Volcano Watch (IAVW) alerts may not be available, should define its strategy for capturing information about increased volcanic activity before pre-eruption alerts are generated. For example, an operator may combine elevated activity information with information concerning the profile and history of the volcano to determine an operating policy, which could include re-routing or restrictions at night. This would be useful when dealing with the 60% of volcanoes which are unmonitored.

Such an operator should also ensure that its crews are aware that they may be the first to observe an eruption and so need to be vigilant and ready to ensure that this information is made available for wider dissemination as quickly as possible.

(2) Start of an eruption

Given the likely uncertainty regarding the status of the eruption during the early stages of an event and regarding the associated volcanic cloud, the operator's procedures should include a requirement for crews to initiate re-routes to avoid the affected airspace.

The operator should ensure that flights are planned to remain clear of the affected areas and that consideration is given to available aerodromes/operating sites and fuel requirements.

It is expected that the following initial actions will be taken by the operator:

(i) determine if any aircraft in flight could be affected, alert the crew and provide advice on re-routing and available aerodromes/operating sites as required;

(ii) alert management;

(iii) for flight departures, brief flight crew and revise flight and fuel planning in accordance with the safety risk assessment;

(iv) alert flight crew and operations staff to the need for increased monitoring of information (e.g. special air report (AIREP), volcanic activity report (VAR), significant weather information (SIGMET), NOTAMs and company messages);

(v) initiate the gathering of all data relevant to determining the risk; and

(vi) apply mitigations identified in the safety risk assessment.

(3) On-going eruption

As the eruptive event develops, the operator can expect the responsible Volcanic Ash Advisory Centre (VAAC) to provide volcanic ash advisory messages (VAA/VAGs) defining, as accurately as possible, the vertical and horizontal extent of areas and layers of volcanic clouds. As a minimum, the operator should monitor, and take account of, this VAAC information as well as of relevant SIGMETs and NOTAMs.

Other sources of information are likely to be available such as VAR/AIREPs, satellite imagery and a range of other information from State and commercial organisations. The operator should plan its operations in accordance with its safety risk assessment taking into account the information that it considers accurate and relevant from these additional sources.

The operator should carefully consider and resolve differences or conflicts among the information sources, notably between published information and observations (pilot reports, airborne measurements, etc.).

Given the dynamic nature of the volcanic hazards, the operator should ensure that the situation is monitored closely and operations adjusted to suit changing conditions.

The operator should be aware that the affected or danger areas may be established and presented in a number of ways, e.g. in Europe the method is described in EUR Doc 019-NAT Doc 006.

The operator should require reports from its crews concerning any encounters with volcanic emissions. These reports should be passed immediately to the appropriate air traffic services (ATS) unit and to the Brunei DCA.

For the purpose of flight planning, the operator should treat the horizontal and vertical limits of the temporary danger area (TDA) or airspace forecast to be contaminated by volcanic ash as applicable, to be overflown as it would mountainous terrain, modified in accordance with its safety risk assessment. The operator should take account of the risk of cabin depressurisation or engine failure resulting in the inability to maintain level flight above a volcanic cloud, especially when conducting ETOPS operations. Additionally, minimum equipment list (MEL) provisions should be considered in consultation with the TCHs.

Flying below volcanic ash contaminated airspace should be considered on a case- by-case basis. It should only be planned to reach or leave an aerodrome/operating site close to the boundary of this airspace or where the ash contamination is very high and stable. The establishment of Minimum Sector Altitude (MSA) and the availability of aerodromes/operating sites should be considered.

(d) Safety risk assessment

When directed specifically at the issue of intended flight into airspace forecast to be or aerodromes/operating sites known to be contaminated with volcanic ash, the process should involve the following:

(1) Identifying the hazards

The generic hazard, in the context of this document, is airspace forecast to be or aerodromes/operating sites known to be contaminated with volcanic ash, and whose characteristics are harmful to the airworthiness and operation of the aircraft.

This GM is referring to volcanic ash contamination since it is the most significant hazard for flight operations in the context of a volcanic eruption. Nevertheless, it might not be the only hazard and therefore the operator should consider additional hazards which could have an adverse effect on aircraft structure or passengers safety such as gases.

Within this generic hazard, the operator should develop its own list of specific hazards taking into account its specific aircraft, experience, knowledge and type of operation, and any other relevant data stemming from previous eruptions.

(2) Considering the severity and consequences of the hazard occurring (i.e. the nature and actual level of damage expected to be inflicted on the particular aircraft from exposure to that volcanic ash cloud).

(3) Evaluating the likelihood of encountering volcanic ash clouds with characteristics harmful to the safe operation of the aircraft.

For each specific hazard within the generic hazard, the likelihood of adverse consequences should be assessed, either qualitatively or quantitatively.

(4) Determining whether the consequent risk is acceptable and within the operator’s risk performance criteria.

At this stage of the process, the safety risks should be classified as acceptable or unacceptable. The assessment of tolerability will be subjective, based on qualitative data and expert judgement, until specific quantitative data are available in respect of a range of parameters.

(5) Taking action to reduce the safety risk to a level that is acceptable to the operator’s management.

Appropriate mitigation for each unacceptable risk identified should then be considered in order to reduce the risk to a level acceptable to the operator’s management.

(e) Procedures to be considered when identifying possible mitigations actions

When conducting a volcanic ash safety risk assessment, the operator should consider the following non-exhaustive list of procedures and processes as mitigation:

(1) Type certificate holders

Obtaining advice from the TCHs and other engineering sources concerning operations in potentially contaminated airspace and/or aerodromes/operating sites contaminated by volcanic ash.

This advice should set out:

(i) the features of the aircraft that are susceptible to airworthiness effects related to volcanic ash;

(ii) the nature and severity of these effects;

(iii) the effect of volcanic ash on operations to/from contaminated aerodromes/operating sites, including the effect on take-off and landing aircraft performance;

(iv) the related pre-flight, in-flight and post-flight precautions to be observed by the operator including any necessary amendments to aircraft operating manuals, aircraft maintenance manuals, master minimum equipment list/dispatch deviation or equivalents; and

(v) the recommended inspections associated with operations in volcanic ash potentially contaminated airspace and operations to/from volcanic ash contaminated aerodromes/operating sites; this may take the form of instructions for continuing airworthiness or other advice.

(2) Operator/contracted organisations’ personnel

Definition of procedures for flight planning, operations, engineering and maintenance ensuring that:

(i) personnel responsible for flight planning are in a position to evaluate correctly the risk of encountering volcanic ash contaminated airspace, or aerodromes/operating sites, and can plan accordingly;

(ii) flight planning and operational procedures enable crews to avoid areas and aerodromes/operating sites with unacceptable volcanic ash contamination;

(iii) flight crew are aware of the possible signs of entry into a volcanic ash cloud and execute the associated procedures;

(iv) continuing airworthiness personnel are able to assess the need for and to execute any necessary maintenance or other required interventions; and

(v) crews are provided with appropriate aircraft performance data when operating to/from aerodromes/operating sites contaminated with volcanic ash.

(3) Provision of enhanced flight watch

This should ensure:

(i) close and continuous monitoring of VAA, VAR/AIREP, SIGMET, NOTAM, ASHTAM and other relevant information, and information from crews, concerning the volcanic ash cloud hazard;

(ii) access to plots of the affected areas from SIGMETs, NOTAMs and relevant company information for crews and personnel responsible for the management and the supervision of the flight operations; and

(iii) communication of the latest information to crews and personnel responsible for the management and the supervision of the flight operations in a timely fashion.

(4) Flight planning

Flexibility of the process to allow re-planning at short notice should conditions change.

(5) Departure, destination and alternate aerodromes

For the airspace to be traversed, or the aerodromes/operating sites in use, parameters to evaluate and take account of:

(i) the probability of contamination;

(ii) any additional aircraft performance requirements;

(iii) required maintenance considerations;

(iv) fuel requirements for re-routeing and extended holding.

(6) Routing policy

Parameters to evaluate and take account of:

(i) the shortest period in and over the forecast contaminated area;

(ii) the hazards associated with flying over the contaminated area;

(iii) drift down and emergency descent considerations;

(iv) the policy for flying below the contaminated airspace and the associated hazards.

(7) Diversion policy

Parameters to evaluate and take account of:

(i) maximum allowed distance from a suitable aerodrome/operating site;

(ii) availability of aerodromes/operating sites outside the forecast contaminated area;

(iii) diversion policy after an volcanic ash encounter.

(8) Minimum equipment list (MEL) Additional provisions in the MEL for dispatching aircraft with unserviceabilities that might affect the following non-exhaustive list of systems:

(i) air conditioning packs;

(ii) engine bleeds;

(iii) pressurisation system;

(iv) electrical power distribution system;

(v) air data system;

(vi) standby instruments;

(vii) navigation systems;

(viii) de-icing systems;

(ix) engine-driven generators;

(x) auxiliary power unit (APU);

(xi) airborne collision avoidance system (ACAS);

(xii) terrain awareness warning system (TAWS);

(xiii) autoland systems;

(xiv) provision of crew oxygen;

(xv) supplemental oxygen for passengers.

(9) Standard operating procedures

Crew training to ensure they are familiar with normal and abnormal operating procedures and particularly any changes regarding but not limited to:

(i) pre-flight planning;

(ii) in-flight monitoring of volcanic ash cloud affected areas and avoidance procedures;

(iii) diversion;

(iv) communications with ATC;

(v) in-flight monitoring of engine and systems potentially affected by volcanic ash cloud contamination;

(vi) recognition and detection of volcanic ash clouds and reporting procedures;

(vii) in-flight indications of a volcanic ash cloud encounter;

(viii) procedures to be followed if a volcanic ash cloud is encountered;

(ix) unreliable or erroneous airspeed;

(x) non-normal procedures for engines and systems potentially affected by volcanic ash cloud contamination;

(xi) engine-out and engine relight;

(xii) escape routes; and

(xiii) operations to/from aerodromes/operating sites contaminated with volcanic ash.

(10) Provision for aircraft technical log

This should ensure:

(i) systematic entry in the aircraft technical log related to any actual or suspected volcanic ash encounter whether in-flight or at an aerodrome/ operating site; and

(ii) checking, prior to flight, of the completion of maintenance actions related to an entry in the aircraft technical log for a volcanic ash cloud encounter on a previous flight.

(11) Incident reporting

Crew requirements for:

(i) reporting an airborne volcanic ash cloud encounter (VAR);

(ii) post-flight volcanic ash cloud reporting (VAR);

(iii) reporting non-encounters in airspace forecast to be contaminated; and

(iv) filing a mandatory occurrence report in accordance with ORO.GEN.160.

(12) Continuing airworthiness procedures

Procedures when operating in or near areas of volcanic ash cloud contamination:

(i) enhancement of vigilance during inspections and regular maintenance and appropriate adjustments to maintenance practices;

(ii) definition of a follow-up procedure when a volcanic ash cloud encounter has been reported or suspected;

(iii) thorough investigation for any sign of unusual or accelerated abrasions or corrosion or of volcanic ash accumulation;

(iv) reporting to TCHs and the relevant authorities observations and experiences from operations in areas of volcanic ash cloud contamination;

(v) completion of any additional maintenance recommended by the TCH or by the Brunei DCA.

(f) Reporting

The operator should ensure that reports are immediately submitted to the nearest ATS unit using the VAR/AIREP procedures followed up by a more detailed VAR on landing and an aircraft technical log entry for:

(1) any incident related to volcanic clouds;

(2) any observation of volcanic ash activity; and

(3) any time that volcanic ash is not encountered in an area where it was forecast to be.

(g) References

Further guidance on volcanic ash safety risk assessment is given in ICAO Doc. 9974 (Flight safety and volcanic ash — Risk management of flight operations with known or forecast volcanic ash contamination).

GM3 ORO.GEN.200(a)(3) Management system

SAFETY RISK ASSESSMENT- RISK REGISTER

The results of the assessment of the potential adverse consequences or outcome of each hazard may be recorded by the operator in a risk register, an example of which is provided below.

Hazard		Incident Sequence Description	Existing Controls	Outcome (Pre-Mitigation)			Additional Mitigation required	Outcome (Post-Mitigation)			Actions and Owners	Monitoring and Review Requirements
No.	Description			Severity	Likelihood	Risk		Severity	Likelihood	Risk		

GM4 ORO.GEN.200(a)(3) Management system

COMPLEX ORGANISATIONS — SAFETY RISK MANAGEMENT — INTERFACES BETWEEN ORGANISATIONS

(a) Hazard identification and risk assessment start with an identification of all parties involved in the arrangement, including independent experts and non-approved organisations. It extends to the overall control structure, assessing, in particular, the following elements across all subcontract levels and all parties within such arrangements:

(1) coordination and interfaces between the different parties;

(2) applicable procedures;

(3) communication between all parties involved, including reporting and feedback channels;

(4) task allocation responsibilities and authorities; and

(5) qualifications and competency of key personnel.

(b) Safety risk management focuses on the following aspects:

(1) clear assignment of accountability and allocation of responsibilities;

(2) only one party is responsible for a specific aspect of the arrangement — no overlapping or conflicting responsibilities, in order to eliminate coordination errors;

(3) existence of clear reporting lines, both for occurrence reporting and progress reporting;

(4) possibility for staff to directly notify the operator of any hazard suggesting an obviously unacceptable safety risk as a result of the potential consequences of this hazard.

AMC1 ORO.GEN.200(a)(4) Management system

TRAINING AND COMMUNICATION ON SAFETY

(a) Training

(1) All personnel should receive safety training as appropriate for their safety responsibilities.

(2) Adequate records of all safety training provided should be kept.

(b) Communication

(1) The operator should establish communication about safety matters that:

(i) ensures that all personnel are aware of the safety management activities as appropriate for their safety responsibilities;

(ii) conveys safety critical information, especially relating to assessed risks and analysed hazards;

(iii) explains why particular actions are taken; and

(iv) explains why safety procedures are introduced or changed.

(2) Regular meetings with personnel where information, actions and procedures are discussed may be used to communicate safety matters.

GM1 ORO.GEN.200(a)(4) Management system

TRAINING AND COMMUNICATION ON SAFETY

The safety training programme may consist of self-instruction via the media (newsletters, flight safety magazines), classroom training, e-learning or similar training provided by training service providers.

AMC1 ORO.GEN.200(a)(5) Management system

MANAGEMENT SYSTEM DOCUMENTATION — GENERAL

(a) The operator’s management system documentation should at least include the following information:

(1) a statement signed by the accountable manager to confirm that the operator will continuously work in accordance with the applicable requirements and the operator’s documentation, as required by this requirement;

(2) the operator's scope of activities;

(3) the titles and names of persons referred to in ORO.GEN.210 (a) and (b);

(4) an operator chart showing the lines of responsibility between the persons referred to in ORO.GEN.210;

(5) a general description and location of the facilities referred to in ORO.GEN.215;

(6) procedures specifying how the operator ensures compliance with the applicable requirements;

(7) the amendment procedure for the operator's management system documentation.

(b) The operator's management system documentation may be included in a separate manual or in (one of) the manual(s), as required by the applicable subpart(s). A cross- reference should be included.

AMC2 ORO.GEN.200(a)(5) Management system

COMPLEX OPERATORS — SAFETY MANAGEMENT MANUAL

(a) The safety management manual (SMM) should be the key instrument for communicating the approach to safety for the whole of the operator. The SMM should document all aspects of safety management, including the safety policy, objectives, procedures and individual safety responsibilities.

(b) The contents of the safety management manual should include all of the following:

(1) scope of the safety management system;

(2) safety policy and objectives;

(3) safety accountability of the accountable manager;

(4) safety responsibilities of key safety personnel;

(5) documentation control procedures;

(6) hazard identification and risk management schemes;

(7) safety action planning;

(8) safety performance monitoring;

(9) incident investigation and reporting;

(10) emergency response planning;

(11) management of change (including organisational changes with regard to safety responsibilities);

(12) safety promotion.

(c) The SMM may be contained in (one of) the manual(s) of the operator.

GM1 ORO.GEN.200(a)(5) Management system

MANAGEMENT SYSTEM DOCUMENTATION — GENERAL

(a) It is not required to duplicate information in several manuals. The information may be contained in any of the operator manuals (e.g. operations manual), which may also be combined.

(b) The operator may also choose to document some of the information required to be documented in separate documents (e.g. procedures). In this case, it should ensure that manuals contain adequate references to any document kept separately. Any such documents are then to be considered an integral part of the operator's management system documentation.

AMC1 ORO.GEN.200(a)(6) Management system

COMPLIANCE MONITORING — GENERAL

(a) Compliance monitoring

The implementation and use of a compliance monitoring function should enable the operator to monitor compliance with the relevant requirements of this requirement and other applicable requirements.

(1) The operator should specify the basic structure of the compliance monitoring function applicable to the activities conducted.

(2) The compliance monitoring function should be structured according to the size of the operator and the complexity of the activities to be monitored.

(b) Organisations should monitor compliance with the procedures they have designed to ensure safe activities. In doing so, they should as a minimum, and where appropriate, monitor compliance with the following:

(1) privileges of the operator;

(2) manuals, logs, and records;

(3) training standards;

(4) management system procedures and manuals;

(5) activities of the organisation carried out under the supervision of the nominated persons in accordance with ORO.GEN.210(b); and

(6) any outsourced activities in accordance with ORO.GEN.205, for compliance with the contract.

(c) Organisational set up

(1) To ensure that the operator continues to meet the requirements of this Part and other applicable Parts, the accountable manager should designate a compliance monitoring manager. The role of the compliance monitoring manager is to ensure that the activities of the operator are monitored for compliance with the applicable regulatory requirements, and any additional requirements as established by the operator, and that these activities are carried out properly under the supervision of the relevant head of functional area.

(2) The compliance monitoring manager should be responsible for ensuring that the compliance monitoring programme is properly implemented, maintained and continually reviewed and improved.

(3) The compliance monitoring manager should:

(i) have direct access to the accountable manager;

(ii) not be one of the other persons referred to in ORO.GEN.210 (b);

(iii) be able to demonstrate relevant knowledge, background and appropriate experience related to the activities of the operator, including knowledge and experience in compliance monitoring; and

(iv) have access to all parts of the operator, and as necessary, any contracted operator.

(4) In the case of a non-complex operator, this task may be exercised by the accountable manager provided he/she has demonstrated having the related competence as defined in (c)(3)(iii).

(5) In the case the same person acts as compliance monitoring manager and as safety manager, the accountable manager, with regards to his/her direct accountability for safety, should ensure that sufficient resources are allocated to both functions, taking into account the size of the operator and the nature and complexity of its activities.

(6) The independence of the compliance monitoring function should be established by ensuring that audits and inspections are carried out by personnel not responsible for the function, procedure or products being audited.

(7) If more than one person is designated for the compliance monitoring function, the accountable manager should identify the person who acts as the unique focal point (i.e. the‘compliance monitoring manager’)

(d) Compliance monitoring documentation

(1) Relevant documentation should include the relevant part(s) of the operator’s management system documentation.

(2) In addition, relevant documentation should also include the following:

(i) terminology;

(ii) specified activity standards;

(iii) a description of the operator;

(iv) the allocation of duties and responsibilities;

(v) procedures to ensure regulatory compliance;

(vi) the compliance monitoring programme, reflecting:

(A) schedule of the monitoring programme;

(B) audit procedures including an audit plan that is implemented, maintained, and continually reviewed and improved;

(C) reporting procedures;

(D) follow-up and corrective action procedures; and

(E) recording system.

(vii) the training syllabus referred to in (e)(2);

(viii) document control.

(e) Training

(1) Correct and thorough training is essential to optimise compliance in every operator. In order to achieve significant outcome of such training, the operator should ensure that all personnel understand the objectives as laid down in the operator's management system documentation.

(2) Those responsible for managing the compliance monitoring function should receive training on this task. Such training should cover the requirements of compliance monitoring, manuals and procedures related to the task, audit techniques, reporting and recording.

(3) Time should be provided to train all personnel involved in compliance management and for briefing the remainder of the personnel.

(4) The allocation of time and resources should be governed by the volume and complexity of the activities concerned.

GM1 ORO.GEN.200(a)(6) Management system

COMPLIANCE MONITORING — GENERAL

(a) The organisational set-up of the compliance monitoring function should reflect the size of the operator and the nature and complexity of its activities. The compliance monitoring manager may perform all audits and inspections himself/herself or appoint one or more auditors by choosing personnel having the related competence as defined in AMC1 ORO.GEN.200 (a)(6) point (c)(3)(iii), either from, within or outside the operator.

(b) Regardless of the option chosen it must be ensured that the independence of the audit function is not affected, in particular in cases where those performing the audit or inspection are also responsible for other functions for the operator.

(c) In case external personnel are used to perform compliance audits or inspections:

(1) any such audits or inspections are performed under the responsibility of the compliance monitoring manager; and

(2) the operator remains responsible to ensure that the external personnel has relevant knowledge, background and experience as appropriate to the activities being audited or inspected; including knowledge and experience in compliance monitoring.

(d) The operator retains the ultimate responsibility for the effectiveness of the compliance monitoring function, in particular for the effective implementation and follow-up of all corrective actions.

GM2 ORO.GEN.200(a)(6) Management system

COMPLEX OPERATORS — COMPLIANCE MONITORING PROGRAMME

(a) Typical subject areas for compliance monitoring audits and inspections for operators should be, as applicable:

(1) actual flight operations;

(2) ground de-icing/anti-icing;

(3) flight support services;

(4) load control;

(5) technical standards.

(b) Operators should monitor compliance with the operational procedures they have designed to ensure safe operations, airworthy aircraft and the serviceability of both operational and safety equipment. In doing so, they should, where appropriate, additionally monitor the following:

(1) operational procedures;

(2) flight safety procedures;

(3) operational control and supervision;

(4) aircraft performance;

(5) all weather operations;

(6) communications and navigational equipment and practices;

(7) mass, balance and aircraft loading;

(8) instruments and safety equipment;

(9) ground operations;

(10) flight and duty time limitations, rest requirements, and scheduling;

(11) aircraft maintenance/operations interface;

(12) use of the MEL;

(13) flight crew;

(14) cabin crew;

(15) dangerous goods;

(16) security.

GM3 ORO.GEN.200(a)(6) Management system

NON-COMPLEX OPERATORS — COMPLIANCE MONITORING

(a) Compliance monitoring audits and inspections may be documented on a 'Compliance Monitoring Checklist', and any findings recorded in a 'Non-compliance Report'. The following documents may be used for this purpose.

COMPLIANCE MONITORING CHECKLIST Year:			
Subject	Date checked	Checked by	Comments / Non-compliance Report
Flight Operations			
Aircraft checklists checked for accuracy and validity			
Minimum five flight plans checked and verified for proper and correct information			
Flight planning facilities checked for updated manuals, documents and access to relevant flight information			
Incident reports evaluated and reported to the appropriate Brunei DCA			
Ground Handling			
Contracts with ground handling organisations established and valid, if applicable			
Instructions regarding fuelling and de-icing issued, if applicable			
Instructions regarding dangerous goods issued and known by all relevant personnel, if applicable			
Mass & Balance			
Min. five load sheets checked and verified for proper and correct information, if applicable			
Aircraft fleet checked for valid weight check, if applicable			
Minimum one check per aircraft of correct loading and distribution, if applicable			
Training			

COMPLIANCE MONITORING CHECKLIST Year:			
Subject	Date checked	Checked by	Comments / Non-compliance Report
Training records updated and accurate			
All pilot licenses checked for currency, correct ratings and valid medical check			
All pilots received recurrent training			
All pilots received daily inspection (DI) training			
Documentation			
All issues of operations manual (OM) checked for correct amendment status			
AOC checked for validity and appropriate operations specifications, if applicable			
Aviation requirements applicable and updated			
Crew flight and duty time record updated, if applicable			
Flight documents record checked and updated			
Compliance monitoring records checked and updated			

NON-COMPLIANCE REPORT — No:		
To Compliance Monitoring Manager		
Reported by:		Date:
Category	Flight Operations ☐	
Ground Handling ☐	Mass & Balance ☐	
Training ☐	Documentation ☐	Other ☐
Description:		
Reference:		
Level of finding:		
Root-cause of non-compliance:		
Suggested correction:		
Compliance Monitoring Manager:		
Corrective action required: ☐	Corrective action not required: ☐	
Responsible Person:		
Time limitation:		
Corrective action:		
Reference:		
Signature Responsible Person:		Date:

NON-COMPLIANCE REPORT — No:			
Compliance Monitoring Manager			
Correction and corrective action verified ☐		Report Closed ☐	
Signature Compliance Monitoring Manager:		Date:	

GM4 ORO.GEN.200(a)(6) Management system

AUDIT AND INSPECTION

(a) 'Audit' means a systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which requirements are complied with.

(b) 'Inspection' means an independent documented conformity evaluation by observation and judgement accompanied as appropriate by measurement, testing or gauging, in order to verify compliance with applicable requirements.

AMC1 ORO.GEN.200(b) Management system

SIZE, NATURE AND COMPLEXITY OF THE ACTIVITY

(a) An operator should be considered as complex when it has a workforce of more than 20 full time equivalents (FTEs) involved in the activity subject to BAR requirements.

(b) Operators with up to 20 FTEs involved in the activity subject to BAR requirements may also be considered complex based on an assessment of the following factors:

(1) in terms of complexity, the extent and scope of contracted activities subject to the approval;

(2) in terms of risk criteria, the extent of the following,

(i) operations requiring a specific approvals:

(ii) high risk commercial specialised operations;

(iii) operations with different types of aircraft used; and

(iv) operations in challenging environment (offshore, mountainous area, etc.).

AMC1 ORO.GEN.205 Contracted activities

RESPONSIBILITY WHEN CONTRACTING ACTIVITIES

(a) The operator may decide to contract certain activities to external organisations.

(b) A written agreement should exist between the operator and the contracted organisation clearly defining the contracted activities and the applicable requirements.

(c) The contracted safety-related activities relevant to the agreement should be included in the operator's safety management and compliance monitoring programmes.

(d) The operator should ensure that the contracted organisation has the necessary authorisation or approval when required and commands the resources and competence to undertake the task.

AMC2 ORO.GEN.205 Contracted activities

THIRD-PARTY PROVIDERS

(a) The initial audit and/or the continuous monitoring of contracted organisations may be performed by a third-party provider on behalf of the operator when it is demonstrated that:

(1) a documented arrangement has been established with the third-party provider;

(2) the audit standards applied by the third-party provider address the scope of this Regulation in sufficient detail;

(3) the third-party provider uses an evaluation system, designed to assess the operational, management and control systems of the contracted organisation;

(4) the independence of the third-party provider, its evaluation system as well as the impartiality of the auditors is ensured;

(5) the auditors are appropriately qualified and have sufficient knowledge, experience and training, including on-the-job training, to perform their allocated tasks;

(6) audits are performed on-site;

(7) access to the relevant data and facilities is granted to the level of detail necessary to verify compliance with the applicable requirements;

(8) access to the full audit report is granted;

(9) procedures have been established for monitoring continuous compliance of the contracted organisation with the applicable requirements; and

(10) procedures have been established to notify the contracted organisation of any non-compliance with the applicable requirements, the corrective actions to be taken, the follow-up of these corrective actions, and closure of findings.

(b) The use of a third-party provider for the initial audit or the monitoring of continuous compliance of the contracted organisation does not exempt the operator from its responsibility under the applicable requirements.

(c) The operator should maintain a list of the contracted organisations monitored by the third-party provider. This list and the full audit report prepared by the third-party provider should be made available to the Brunei DCA upon request.

GM1 ORO.GEN.205 Contracted activities

CONTRACTING — GENERAL

(a) Operators may decide to contract certain activities to external organisations for the provision of services related to areas such as:

(1) ground de-icing/anti-icing;

(2) ground handling;

(3) flight support (including performance calculations, flight planning, navigation database and dispatch);

(4) training; and

(5) manual preparation.

(b) Contracted activities include all activities within the operator’s scope of approval that are performed by another organisation either itself certified or authorised to carry out such activity or if not certified or authorised, working under the operator’s approval.

(c) The ultimate responsibility for the product or service provided by external organisations should always remain with the operator.

GM2 ORO.GEN.205 Contracted activities

RESPONSIBILITY WHEN CONTRACTING ACTIVITIES

(a) Regardless of the approval status of the contracted organisation, the contracting operator is responsible for ensuring that all contracted activities are subject to hazard identification and risk management, as required by ORO.GEN.200 (a)(3), and to compliance monitoring, as required by ORO.GEN.200 (a)(6).

(b) When the contracted organisation is itself certified or authorised to carry out the contracted activities, the operator’s compliance monitoring should at least check that the approval effectively covers the contracted activities and that it is still valid.

AMC1 ORO.GEN.210(a) Application for an air operator certificate

INFORMATION ON THE ACCOUNTABLE MANAGER

As part of being granted an air operator certificate (AOC), the operator should provide the Brunei DCA with the following detailed information regarding the accountable manager:

(a) name of the accountable manager;

(b) position within the organisation;

(c) information on means to ensure that all activities can be financed and carried out;

(d) qualification relevant to the position; and

(e) work experience relevant to the position.

GM1 ORO.GEN.210(a) Personnel requirements

FUNCTION OF THE ACCOUNTABLE MANAGER

(a) The accountable manager should have the overall responsibility for running the organisation.

(b) When the accountable manager is not the chief executive officer, the Brunei DCA should be assured that the accountable manager has direct access to the chief executive officer and has the necessary air operations funding allocation.

AMC1 ORO.GEN.220(b) Record-keeping

GENERAL

(a) The record-keeping system should ensure that all records are accessible whenever needed within a reasonable time. These records should be organised in a way that ensures traceability and retrievability throughout the required retention period.

(b) Records should be kept in paper form or in electronic format or a combination of both. Records stored on microfilm or optical disc format are also acceptable. The records should remain legible throughout the required retention period. The retention period starts when the record has been created or last amended.

(c) Paper systems should use robust material which can withstand normal handling and filing. Computer systems should have at least one backup system which should be updated within 24 hours of any new entry. Computer systems should include safeguards against the ability of unauthorised personnel to alter the data.

(d) All computer hardware used to ensure data backup should be stored in a different location from that containing the working data and in an environment that ensures they remain in good condition. When hardware or software changes take place, special care should be taken that all necessary data continues to be accessible at least through the full period specified in the relevant subpart. In the absence of such indication, all records should be kept for a minimum period of 5 years.

GM1 ORO.GEN.220(b) Record-keeping

Records

Microfilming or optical storage of records may be carried out at any time. The records should be as legible as the original record and remain so for the required retention period.

Section 3 – Additional Organisational Requirements

GM1 ORO.GEN.310 Use of aircraft listed on an AOC for non-commercial operations and specialised operations

EXAMPLES OF POSSIBLE SCENARIOS FOR THE USE OF AIRCRAFT LISTED ON AN AOC

'Aircraft listed on an AOC' means any aircraft included in the AOC certification process, to which the privileges of the AOC apply. The registration marks of these aircraft are indicated either in the operations specifications form or in the operations manual of the AOC holder.

The following examples provide possible scenarios with organisations and operators to which this rule applies:

(a) The same AOC holder providing the aircraft, using the aircraft either:

(1) as a declared operator for SPO (commercial or non-commercial, including high-risk SPO) in accordance with Part-ORO and Part-SPO for operations with complex motor-powered aircraft. In such a case, the provisions of Part-SPO and Part-ORO apply. This implies that the operator submits a declaration for its SPO activities and applies for an authorisation if it performs high-risk SPO; or

(2) as a training organisation (approved training organisation (ATO) or declared training organisation (DTO)) for operations performed in accordance with Part-NCC or Part-NCO.

(b) Another AOC holder:

(1) as a declared operator, using complex motor-powered aircraft for NCC operations in accordance with Part-ORO and Part-NCC or for SPO activities (commercial or non-commercial), including high-risk SPO in accordance with Part-ORO and Part-SPO;

(2) as a training organisation (ATO or DTO), using the aircraft for operations performed in accordance with Part-NCC or Part-NCO; or

(3) using other than complex motor-powered aircraft for NCO operations.

(c) An NCC operator or a SPO operator, for operations performed in accordance with Part-ORO and Part-NCC or in accordance with Part-ORO and Part-SPO (commercial or non-commercial), including high-risk SPO.

(d) An NCO operator or a SPO operator conducting non-commercial operations with other than complex motor-powered aircraft in accordance with Part-NCO.

(e) A training organisation (ATO or DTO), commercial or non-commercial, conducting operations in accordance with Part-NCC or Part-NCO.

GM2 ORO.GEN.310 Use of aircraft listed on an AOC for non-commercial operations and specialised operations

SPECIFIC APPROVALS

(a) Specific approvals (SPA) of the AOC holder using its aircraft for non-commercial operations and specialised operations.

(1) When the AOC holder performs operations in accordance with Part-NCC or Part-NCO, the SPA granted for the AOC extend over these operations, as in such cases the provisions of ORO.AOC.125 apply.

(2) When the AOC holder performs operations in accordance with Part-SPO, as a declared operator, either:

(i) the SPA applicable to its SPO activities for the same aircraft are already granted within its AOC. In this case, the operator does not need to apply for them again; or

(ii) the SPA applicable to its SPO activities for the same aircraft are partially different from the SPA already granted within its AOC. In this case, the specific approval will cover all the different aspects involved in SPO operation or training of relevant personnel; or

(iii) the SPA are not granted within its AOC. In this case, the operator applies for the relevant SPA to its Brunei DCA, in accordance with Part-SPA. This means that all the elements required for a SPA will be provided to the Brunei DCA evidence of the relevant airworthiness approval, specific equipment approval, operational procedures, and training programme specific for each of the SPA applied for.

(b) SPA of any other operator, regardless of whether it also holds an AOC, using the aircraft as a declared operator or as a(n) ATO/DTO.

The declared operator performing NCC operations or SPO or the ATO/DTO has to comply with Part-SPA and apply for the SPA required for the type of operation it intends to conduct with that aircraft.

MINIMUM EQUIPMENT LIST (MEL)

The operator that uses the aircraft listed on the AOC of another operator is still responsible for obtaining the approval of the MEL for its own operations, to cover all the aircraft that it operates.

GM1 ORO.GEN.310 Use of aircraft listed on an AOC for non-commercial operations and specialised operations

EXCEEDING 30 DAYS OF CONTINUOUS OPERATION

When the other operator uses or intends to use the aircraft without returning it to the AOC holder for a duration that exceeds 30 days, then the provisions of ORO.GEN.310 no longer apply; instead, the provisions of ORO.AOC.110 apply and the AOC holder has to remove that aircraft from its AOC.

AMC1 ORO.GEN.310(b);(e) Use of aircraft listed on an AOC for non-commercial operations and specialised operations

RESPONSIBILITIES OF THE AOC HOLDER

(a) The AOC holder providing the aircraft should include the following information in the respective parts of its operations manual:

(1) how the relevant personnel are informed about which of the operators is responsible for the operational control of each flight;

(2) when possible, which of the aircraft are used by the AOC holder itself, when conducting operations as a different operator (SPO operator, ATO or DTO), or by other operators;

(3) when possible, the name of the other operators using the aircraft for operations performed in accordance with ORO.GEN.310;

(4) when possible, the frequency with which the aircraft is used by the other operators;

(5) the means of instructing the relevant personnel on the continuing airworthiness procedure covering the use of the aircraft by other operators; and

(6) a customised list of occurrences that the other operators have to report to the AOC holder when using the aircraft in accordance with ORO.GEN.310. This list may be adjusted to fit the aircraft used by the other operators, as well as the type of operation for which it is used. The AOC holder should communicate this list to the other operators.

(b) The AOC holder should ensure that the operations specifications form of the respective aircraft is not carried on board when that aircraft is used by other operators for their NCC, NCO or SPO operations.

GM1 ORO.GEN.310(d) Use of aircraft listed on an AOC for non-commercial operations and specialised operations

CONTINUING AIRWORTHINESS MANAGEMENT

In accordance with Part-M and Part-ML to airworthiness requirements, the management of the continuing airworthiness of the aircraft by the continuing airworthiness management organisation (CAMO) or the combined airworthiness organisation (CAO) of the AOC holder means that the other operator has established a written contract as per Appendix I to Part-M or Appendix I to Part-ML with this CAMO or CAO.

AMC1 ORO.GEN.310(b);(d);(f) Use of aircraft listed on an AOC for non-commercial operations and specialised operations

RESPONSIBILITIES OF THE OTHER OPERATOR

The other operator using the aircraft listed on an AOC for operations under ORO.GEN.310 should include the following elements in its procedure:

(a) a description of the way in which the shifting of operational control is communicated, including how, when and to whom the information is communicated;

(b) a description of the specific responsibilities resulting from having the operational control of the flight performed with the aircraft listed on the AOC;

(c) a description of the means to ensure that the relevant personnel are instructed to:

(1) contact the organisation responsible for the management of continuing airworthiness of the aircraft of the AOC holder (CAMO or CAO) for any defect or technical malfunction which occurs before or during the operation.

The information about any defect or malfunction should be transmitted to the CAMO or CAO of the AOC holder before the aircraft is used for the next flight. The same information should be confirmed by the entries in the aircraft technical log system; and

(2) report any occurrence in accordance with the applicable rules and the internal procedures; and

(d) a customised list of occurrences, as developed by the AOC holder, which the other operator should use when informing the AOC holder of any safety-relevant issue or event that occurred while the aircraft was under its operational control.

Subpart AOC – Air Operator Certification

AMC1 ORO.AOC.100 Application for an AOC (AOC)

APPLICATION TIME FRAMES

The application for the initial issue of an AOC should be submitted at least 90 days before the intended start date of operation. The operations manual may be submitted later, but in any case not later than 60 days before the intended start date of operation.

AMC1 ORO.AOC.100(a) Application for an AOC

OPERATOR SECURITY PROGRAMME

As part of granting the AOC, the CAT operator should provide the Brunei DCA with the operator's security programme, including security training. The security programme should be adapted to the type and area of operation, as well as to the aircraft operated.

GM1 ORO.AOC.100(c) Application for an air operator certificate

MEANING OF CERTIFICATE OF AIRWORTHINESS

A certificate of airworthiness means either a certificate of airworthiness issued in accordance with Part-21.B.326 or a restricted certificate of airworthiness issued in accordance with Part-21.B.327.

AMC1 ORO.AOC.110 Leasing agreement

GENERAL

(a) The operator intending to lease-in an aircraft should provide the Brunei DCA with the following information:

  (1) the aircraft type, registration markings and serial number as soon as available;

  (2) the name and address of the registered owner;

  (3) a copy of the valid certificate of airworthiness;

  (4) a copy of the lease agreement or description of the lease provisions, except financial arrangements; and

  (5) duration of the lease.

(b) in case of wet lease-in, a copy of the AOC of the third country operator and the areas of operation.

(c) The information mentioned above should be accompanied by a statement signed by the lessee that the parties to the lease agreement fully understand their respective responsibilities under the applicable regulations.

AMC1 ORO.AOC.110(c) Leasing agreement

WET LEASE-IN WITH A THIRD COUNTRY OPERATOR

If the operator is not intending to apply Brunei Darussalam safety requirements for air operations and continuing airworthiness when wet leasing-in an aircraft registered in a third country, it should demonstrate to the Brunei DCA that the standards complied with are equivalent to the following requirements:

(a) Part-CAT;

(b) Part-ORO:

  (1) ORO.GEN.110 and Section 2 of Subpart GEN;

  (2) ORO.MLR, excluding ORO.MLR.105;

  (3) ORO.FC;

  (4) ORO.CC, excluding ORO.CC.200 and ORO.CC.210(a);

  (5) ORO.TC;

  (6) ORO.FTL; and

  (7) ORO.SEC;

(c) Part-SPA, if applicable;

(d) for continuing airworthiness management of the third country operator, BAR 8 Part-M Subpart-B, Subpart-C and Subpart-G, excluding M.A.707, and M.A.710;

(e) for the maintenance organisation used by the third country operator during the lease period: Part-145; and

(f) retroactive airworthiness requirements in accordance with Part-26; and

(g) the operator should provide the Brunei DCA with a full description of the flight time limitation scheme(s), operating procedures and safety assessment demonstrating compliance with the safety objectives set out in points (b) (1)-(6).

AMC2 ORO.AOC.110(c) Leasing agreement

WET LEASE-IN

The lessee should maintain a record of occasions when lessors are used, for inspection by the State that issued its AOC.

GM1 ORO.AOC.110(c) Leasing agreement

SHORT-TERM WET LEASE-IN WITH A THIRD COUNTRY OPERATOR

In anticipation of an operational need the operator may enter into a framework agreement with more than one third-country operator provided that these operators comply with ORO.AOC.110 (c). These third-country operators should be placed in a list maintained by the lessee.

AMC1 ORO.AOC.110(f) Leasing agreement

WET LEASE-OUT

When notifying the Brunei DCA, the operator intending to wet lease-out an aircraft should provide the Brunei DCA with the following information:

(a) the aircraft type, registration markings and serial number;

(b) the name and address of the lessee;

(c) a copy of the lease agreement or description of the lease provisions, except financial arrangements; and

(d) the duration of the lease agreement.

AMC1 ORO.AOC.115(a)(1) Code share agreements

INITIAL VERIFICATION OF COMPLIANCE

(a) In order to verify the third country operator’s compliance with the applicable ICAO standards, in particular ICAO Annexes 1, 2, 6, Part I and III, as applicable, 8 and 18, the operator should conduct an audit of the third country operator, including interviews of personnel and inspections carried out at the third country operator’s facilities.

(b) The audit should focus on the operational, management and control systems of the operator.

AMC1 ORO.AOC.115(b) Code-share arrangements

CODE-SHARE AUDIT PROGRAMME

(a) Operators should establish a code-share audit programme for monitoring continuous compliance of the third country operator with the applicable ICAO standards. Such a code-share audit programme should include:

   (1) the audit methodology (audit report + compliance statements);

   (2) details of the specific operational areas to audit;

   (3) criteria for defining satisfactory audit results;

   (4) a system for reporting and correcting findings;

   (5) a continuous monitoring system;

   (6) auditor qualification and authorisation; and

   (7) the frequency of audits.

(b) The third country code-share operator should be audited at periods not exceeding 24 months. The beginning of the first 24-month oversight planning cycle is determined by the date of the first audit and should then determine the start and end dates of the recurrent 24-month planning cycle. The interval between two audits should not exceed 24 months.

(c) The operator should ensure a renewal audit of each third country code-share operator prior to the audit expiry date of the previous audit. The audit expiry date for the previous audit becomes the audit effective date for the renewal audit provided the closing meeting for the renewal audit is within 150 days prior to the audit expiry date for the previous audit. If the closing meeting for the renewal audit is more than 150 days prior to the audit expiry date from the previous audit, then the audit effective date for the renewal audit is the day of the closing meeting of the renewal audit. Renewal audits are valid for 24 consecutive months beginning with the audit effective date and ending with the audit expiry date.

(d) A code-share audit could be shared by several operators. In case of a shared audit, the report should be made available for review by all duly identified sharing operators by any means.

(e) After closure of all findings identified during the audit, the operator should submit an audit compliance statement to the Brunei DCA demonstrating that the third country operator meets all the applicable safety standards.

AMC2 ORO.AOC.115(b) Code-share agreements

THIRD-PARTY PROVIDERS

(a) The initial audit and/or the continuous monitoring may be performed by a third-party provider on behalf of the operator in accordance with AMC2 ORO.GEN.205 on contracted activities.

(b) The use of a third-party provider for the initial audit or the monitoring of continuous compliance of the third country code-share operator does not exempt the operator from its responsibility under ORO.AOC.115.

(c) The operator should maintain a list of the third country code-share operators monitored by the third-party provider. This list and the full audit report prepared by the third party provider should be made available to the Brunei DCA upon request.

AMC1 ORO.AOC.125(a) Non-commercial operations of an AOC holder with aircraft listed on its AOC

FLIGHT AND DUTY TIME LIMITATIONS AND REST REQUIREMENTS

When aircrew members are assigned to perform a series of flights that combine several types of operation (CAT, NCC/NCO), the operator should:

(a) comply at any time with the provisions of ORO.FTL.210 ‘Flight times and duty periods’ or, as applicable, to ensure compliance with Subpart FTL for any CAT operation; and

(b) include any combination of types of operation in its safety risk management process to ensure that the fatigue risks arising from such operations do not affect the CAT operation.

AMC2 ORO.AOC.125(a) Non-commercial operations of an AOC holder with aircraft listed on its AOC

APPLICABLE REQUIREMENTS

An AOC holder should apply either of the options below to its non-commercial operations:

(a) the same operational procedures as those used for its CAT operations. In this case, the AOC holder should state this option in the operations manual and ensure that the procedures comply with Part-CAT. No further descriptions are required; or

(b) different operational procedures from those used for its CAT operations. In this case, the procedures should comply with Part-ORO, except for Subpart-DEC, and Part-NCC for complex motor-powered aircraft or with Part-NCO for other than complex motor-powered aircraft, as appropriate.

AMC1 ORO.AOC.125(a)(2) Non-commercial operations of an AOC holder with aircraft listed on its AOC

DIFFERENT OPERATING PROCEDURES FOR NON-COMMERCIAL OPERATIONS

When developing operating procedures for non-commercial operations that are different from the ones used for its CAT operations, the AOC holder should identify the hazards and assess and mitigate the risks associated with each specific non-commercial operation, as part of the safety risk management process in compliance with ORO.GEN.200.

This process should consider at least the following elements:

(a) Flight profile (including manoeuvres to be performed, any simulated abnormal situations in flight, duties and responsibilities of the crew members);

(b) Continuing airworthiness, as applicable. This includes the case when the aircraft is returned to the AOC holder after having been used by another operator for operations in accordance with ORO.GEN.310;

(c) Levels of functional equipment and systems (MEL, CDL);

(d) Operating procedures, minima, and dispatch criteria;

(e) Operating a flight with a double purpose (e.g. a relocation flight used as a line training flight or a maintenance check flight used as a line training flight);

(f) Specific approvals held by the AOC holder;

(g) Flight and duty time limitations and rest requirements and cumulative fatigue;

(h) Selection, composition, and training of flight crew and cabin crew;

(i) Multi-pilot operation as per Part-CAT vs single-pilot operation when operating according to Part-NCC or Part-NCO;

(j) Flights performed with aircrew that includes aircrew members of another operator, who have not completed a familiarisation training and who may not be familiar with the AOC holder's operational procedures;

(k) Categories of passengers on board, including when non-commercial operations are performed with no cabin crew.

AMC2 ORO.AOC.125(a)(2) Non-commercial operations of an AOC holder with aircraft listed on its AOC

PLANNING FLIGHTS WITH AN INCREASED LEVEL OF RISK

(a) Significant aspects such as the ones below should be addressed in the risk assessment and risk mitigation process by any operator conducting such flights:

  (1) which pilots are involved in their operation;

  (2) what is the purpose of the flight; and

  (3) how it is to be accomplished — what flight procedures are to be applied.

(b) The AOC holder should prepare the non-commercial operations with an increased level of risk taking into consideration the following elements, as applicable:

  (1) pre-flight briefing;

  (2) duties and responsibilities of the flight crew members involved, task sharing;

  (3) special operating procedures;

  (4) manoeuvres to be performed in flight, minimum and maximum speeds and altitudes for all portions of the flight;

  (5) operational limitations;

  (6) potential risks and contingency plans;

  (7) adequate available airspace and coordination with the air traffic control (ATC);

  (8) selection of flight crew members; and

  (9) additional flight crew training at regular intervals to ensure recency (considering also a flight of a similar risk profile in the simulator, if needed).

GM1 ORO.AOC.125(a)(2) Non-commercial operations of an AOC holder with aircraft listed on an AOC

EXAMPLES OF DIFFERENT OPERATING PROCEDURES APPLIED TO NON-COMMERCIAL OPERATIONS

The provisions of ORO.AOC.125 enable an AOC holder to apply the most appropriate requirements when conducting non-commercial operations, based on the risk assessment and risk mitigation processes.

Below is a non-exhaustive list of elements that an AOC holder may identify and describe as being different in its non-commercial operations from those used for its CAT operation and for which the provisions of Part-ORO and Part-NCC or the provisions of Part-NCO should apply as appropriate:

(a) Qualification, training and experience of aircrew members, including aerodrome and route competence requirements.

(b) Flight crew and cabin crew composition requirements

  (1) CAT operations contain more stringent requirements for aircrew members, e.g. multi-pilot vs single-pilot requirements.

  (2) The AOC holder should specify the minimum number of flight crew and cabin crew and the applicable aircrew composition.

(c) Fuel requirements

(d) Performance requirements

(e) Serviceable instruments, data and equipment and MEL considerations

(f) Non-ETOPS/ETOPS

ETOPS are applicable to CAT operations only and thus a flight operated according to Part-NCC/Part-NCO may be performed without the ETOPS restrictions.

(h) Non-commercial flights with no cabin crew (see ORO.CC.100(d) and the associated AMC).

AMC1 ORO.AOC.130 Flight data monitoring — aeroplanes

FLIGHT DATA MONITORING (FDM) PROGRAMME

(a) The safety manager, as defined under AMC1 ORO.GEN.200 (a)(1), should be responsible for the identification and assessment of issues and their transmission to the manager(s) responsible for the process(es) concerned. The latter should be responsible for taking appropriate and practicable safety action within a reasonable period of time that reflects the severity of the issue.

(b) A FDM programme should allow an operator to:

(1) identify areas of operational risk and quantify current safety margins;

(2) identify and quantify operational risks by highlighting occurrences of non- standard, unusual or unsafe circumstances;

(3) use the FDM information on the frequency of such occurrences, combined with an estimation of the level of severity, to assess the safety risks and to determine which may become unacceptable if the discovered trend continues;

(4) put in place appropriate procedures for remedial action once an unacceptable risk, either actually present or predicted by trending, has been identified; and

(5) confirm the effectiveness of any remedial action by continued monitoring.

(c) FDM analysis techniques should comprise the following:

(1) Exceedance detection: searching for deviations from aircraft flight manual limits and standard operating procedures. A set of core events should be selected to cover the main areas of interest to the operator and as much as possible, the most significant risks identified by the operator. The event definitions limits should be continuously reviewed to reflect the operator's current operating procedures.

(2) All flights measurement: a system defining what is normal practice. This may be accomplished by retaining various snapshots of information from each flight.

(3) Statistics — a series of data collected to support the analysis process: this technique should include the number of flights flown per aircraft and sector details sufficient to generate rate and trend information.

(d) FDM analysis, assessment and process control tools: the effective assessment of information obtained from digital flight data should be dependent on the provision of appropriate information technology tool sets.

(e) Education and publication: sharing safety information should be a fundamental principle of aviation safety in helping to reduce accident rates. The operator should pass on the lessons learnt to all relevant personnel and, where appropriate, industry.

(f) Accident and incident data requirements specified in CAT.GEN.MPA.195 take precedence over the requirements of a FDM programme. In these cases the FDR data should be retained as part of the investigation data and may fall outside the de- identification agreements.

(g) Every crew member should be responsible for reporting events. Significant risk- bearing incidents detected by FDM should therefore normally be the subject of mandatory occurrence reporting by the crew. If this is not the case, then they should submit a retrospective report that should be included under the normal process for reporting and analysing hazards, incidents and accidents.

(h) The data recovery strategy should ensure a sufficiently representative capture of flight information to maintain an overview of operations. Data analysis should be performed sufficiently frequently to enable action to be taken on significant safety issues.

(i) The data retention strategy should aim at providing the greatest safety benefits practicable from the available data. A full dataset should be retained until the action and review processes are complete; thereafter, a reduced dataset relating to closed issues should be maintained for longer-term trend analysis. Programme managers may wish to retain samples of de-identified full-flight data for various safety purposes (detailed analysis, training, benchmarking, etc.).

(j) The data access and security policy should restrict information access to authorised persons. When data access is required for airworthiness and maintenance purposes, a procedure should be in place to prevent disclosure of crew identity.

(k) The procedure to prevent disclosure of crew identity should be written in a document, which should be signed by all parties (airline management, flight crew member representatives nominated either by the union or the flight crew themselves). This procedure should, as a minimum, define:

(1) the aim of the FDM programme;

(2) a data access and security policy that should restrict access to information to specifically authorised persons identified by their position;

(3) the method to obtain de-identified crew feedback on those occasions that require specific flight follow-up for contextual information; where such crew contact is required the authorised person(s) need not necessarily be the programme manager or safety manager, but could be a third party (broker) mutually acceptable to unions or staff and management;

(4) the data retention policy and accountability, including the measures taken to ensure the security of the data;

(5) the conditions under which advisory briefing or remedial training should take place; this should always be carried out in a constructive and non-punitive manner;

(6) the conditions under which the confidentiality may be withdrawn for reasons of gross negligence or significant continuing safety concern;

(7) the participation of flight crew member representative(s) in the assessment of the data, the action and review process and the consideration of recommendations; and

(8) the policy for publishing the findings resulting from FDM.

(l) Airborne systems and equipment used to obtain FDM data should range from a quick access recorder (QAR) in an modern aircraft with digital systems, to a crash-protected recorder in an older or less sophisticated aircraft. The analysis potential of the reduced data set available in the latter case may reduce the safety benefits obtainable. The operator should ensure that FDM use does not adversely affect the serviceability of equipment required for accident investigation.

GM1 ORO.AOC.130 Flight data monitoring — aeroplanes

IMPLEMENTATION OF A FDM PROGRAMME

Flight data monitoring is defined in Annex I to this Regulation. It should be noted that the requirement to establish a FDm programme is applicable to all individual aircraft in the scope of ORO.AOC.130, not to a subset selected by the operator.

(a) FDM analysis techniques

(1) Exceedance detection

(i) FDM programmes are used for detecting exceedances, such as deviations from flight manual limits, standard operating procedures (SOPs), or good airmanship. Typically, a set of core events establishes the main areas of interest that are based on a prior assessment of the most significant risks by the operators. In addition, it is advisable to consider the following risks: risk of runway excursion or abnormal runway contact at take-off or landing, risk of loss of control in flight, risk of airborne collision, and risk of collision with terrain.

Examples: low or high lift-off rotation rate, stall warning, ground proximity warning system (GPWS) warning, flap limit speed exceedance, fast approach, high or low on glideslope, and heavy landing.

(ii) Trigger logic expressions may be simple exceedances such as redline values. The majority, however, are composites that define a certain flight mode, aircraft configuration or payload-related condition. Analysis software can also assign different sets of rules dependent on airport or geography. For example, noise sensitive airports may use higher than normal glideslopes on approach paths over populated areas. In addition, it might be valuable to define several levels of exceedance severity (such as low, medium and high).

(iii) Exceedance detection provides useful information, which can complement that provided in crew reports.

(iv) Examples: reduced flap landing, emergency descent, engine failure, rejected take-off, go-around, airborne collision avoidance system (ACAS) or GPWS warning, and system malfunctions.

(v) The operator may also modify the standard set of core events to account for unique situations they regularly experience, or the SOPs they use.

(vi) Example: to avoid nuisance exceedance reports from a non-standard instrument departure.

(vii) The operator may also define new events to address specific problem areas.

(viii) Example: restrictions on the use of certain flap settings to increase component life.

(2) All-flights measurements

FDM data are retained from all flights, not just the ones producing significant events. A selection of parameters is retained that is sufficient to characterise each flight and allow a comparative analysis of a wide range of operational variability. Emerging trends and tendencies may be identified and monitored before the trigger levels associated with exceedances are reached.

Examples of parameters monitored: take-off weight, flap setting, temperature, rotation and lift-off speeds versus scheduled speeds, maximum pitch rate and attitude during rotation, and gear retraction speeds, heights and times.

Examples of comparative analyses: pitch rates from high versus low take-off weights, good versus bad weather approaches, and touchdowns on short versus long runways.

(3) Statistics

Series of data are collected to support the analysis process: these usually include the numbers of flights flown per aircraft and sector details sufficient to generate rate and trend information.

(4) Investigation of incidents flight data

Recorded flight data provide valuable information for follow-up to incidents and other technical reports. They are useful in adding to the impressions and information recalled by the flight crew. They also provide an accurate indication of system status and performance, which may help in determining cause and effect relationships.

Examples of incidents where recorded data could be useful:

- high cockpit workload conditions as corroborated by such indicators as late descent, late localizer and/or glideslope interception, late landing configuration;
- unstabilised and rushed approaches, glide path excursions, etc.;
- exceedances of prescribed operating limitations (such as flap limit speeds, engine over temperatures); and
- wake vortex encounters, turbulence encounters or other vertical accelerations.

It should be noted that recorded flight data have limitations, e.g. not all the information displayed to the flight crew is recorded, the source of recorded data may be different from the source used by a flight instrument, the sampling rate or the recording resolution of a parameter may be insufficient to capture accurate information.

(5) Continuing airworthiness

Data of all-flight measurements and exceedance detections can be utilised to assist the continuing airworthiness function. For example, engine-monitoring programmes look at measures of engine performance to determine operating efficiency and predict impending failures.

Examples of continuing airworthiness uses: engine thrust level and airframe drag measurements, avionics and other system performance monitoring, flying control performance, and brake and landing gear usage.

(b) FDM equipment

(1) General

FDM programmes generally involve systems that capture flight data, transform the data into an appropriate format for analysis, and generate reports and visualisation to assist in assessing the data. Typically, the following equipment capabilities are needed for effective FDM programmes:

(i) an on-board device to capture and record data on a wide range of in-flight parameters;

(ii) a means to transfer the data recorded on board the aircraft to a ground- based processing station;

(iii) a ground-based computer system to analyse the data, identify deviations from expected performance, generate reports to assist in interpreting the read-outs, etc.; and

(iv) optional software for a flight animation capability to integrate all data, presenting them as a simulation of in-flight conditions, thereby facilitating visualisation of actual events.

(2) Airborne equipment

(i) The flight parameters and recording capacity required for flight data recorders (FDR) to support accident investigations may be insufficient to support an effective FDM programme. Other technical solutions are available, including the following:

(A) Quick access recorders (QARs). QARs are installed in the aircraft and record flight data onto a low-cost removable medium.

(B) Some systems automatically download the recorded information via secure wireless systems when the aircraft is in the vicinity of the gate. There are also systems that enable the recorded data to be analysed on board while the aircraft is airborne.

(ii) Fleet composition, route structure and cost considerations will determine the most cost-effective method of removing the data from the aircraft.

(3) Ground replay and analysis equipment

(i) Data are downloaded from the aircraft recording device into a ground- based processing station, where the data are held securely to protect this sensitive information.

(ii) FDM programmes generate large amounts of data requiring specialised analysis software.

(iii) The analysis software checks the downloaded flight data for abnormalities.

(iv) The analysis software may include: annotated data trace displays, engineering unit listings, visualisation for the most significant incidents, access to interpretative material, links to other safety information and statistical presentations.

(c) FDM in practice

(1) FDM process

Typically, operators follow a closed-loop process in applying a FDM programme, for example:

(i) Establish a baseline: initially, operators establish a baseline of operational parameters against which changes can be detected and measured.

(ii) Examples: rate of unstable approaches or hard landings.

(iii) Highlight unusual or unsafe circumstances: the user determines when non-standard, unusual or basically unsafe circumstances occur; by comparing them to the baseline margins of safety, the changes can be quantified.

(iv) Example: increases in unstable approaches (or other unsafe events) at particular locations.

(v) Identify unsafe trends: based on the frequency and severity of occurrence, trends are identified. Combined with an estimation of the level of severity, the risks are assessed to determine which may become unacceptable if the trend continues.

(vi) Example: a new procedure has resulted in high rates of descent that are nearly triggering GPWS warnings.

(vii) Mitigate risks: once an unacceptable risk has been identified, appropriate risk mitigation actions are decided on and implemented.

(viii) Example: having found high rates of descent, the SOPs are changed to improve aircraft control for optimum/maximum rates of descent.

(ix) Monitor effectiveness: once a remedial action has been put in place, its effectiveness is monitored, confirming that it has reduced the identified risk and that the risk has not been transferred elsewhere.

(x) Example: confirm that other safety measures at the aerodrome with high rates of descent do not change for the worse after changes in approach procedures.

(2) Analysis and follow-up

(i) FDM data are typically compiled every month or at shorter intervals. The data are then reviewed to identify specific exceedances and emerging undesirable trends and to disseminate the information to flight crews.

(ii) If deficiencies in pilot handling technique are evident, the information is usually de-identified in order to protect the identity of the flight crew. The information on specific exceedances is passed to a person (safety manager, agreed flight crew representative, honest broker) assigned by the operator for confidential discussion with the pilot. The person assigned by the operator provides the necessary contact with the pilot in order to clarify the circumstances, obtain feedback and give advice and recommendations for appropriate action. Such appropriate action could include re-training for the pilot (carried out in a constructive and non- punitive way), revisions to manuals, changes to ATC and airport operating procedures.

(iii) Follow-up monitoring enables the effectiveness of any corrective actions to be assessed. Flight crew feedback is essential for the identification and resolution of safety problems and could be collected through interviews, for example by asking the following:

(A) Are the desired results being achieved soon enough?

(B) Have the problems really been corrected, or just relocated to another part of the system?

(C) Have new problems been introduced?

(iv) All events are usually archived in a database. The database is used to sort, validate and display the data in easy-to-understand management reports. Over time, this archived data can provide a picture of emerging trends and hazards that would otherwise go unnoticed.

(v) Lessons learnt from the FDM programme may warrant inclusion in the operator's safety promotion programmes. Safety promotion media may include newsletters, flight safety magazines, highlighting examples in training and simulator exercises, periodic reports to industry and the Brunei DCA. Care is required, however, to ensure that any information acquired through FDM is de-identified before using it in any training or promotional initiative.

(vi) All successes and failures are recorded, comparing planned programme objectives with expected results. This provides a basis for review of the FDM programme and the foundation for future programme development.

(d) Preconditions for an effective FDM programme

(1) Protection of FDM data

The integrity of FDM programmes rests upon protection of the FDM data. Any disclosure for purposes other than safety management can compromise the voluntary provision of safety data, thereby compromising flight safety.

(2) Essential trust

The trust established between management and flight crew is the foundation for a successful FDM programme. This trust can be facilitated by:

(i) early participation of the flight crew representatives in the design, implementation and operation of the FDM programme;

(ii) a formal agreement between management and flight crew, identifying the procedures for the use and protection of data; and

(iii) data security, optimised by:

(A) adhering to the agreement;

(B) the operator strictly limiting data access to selected individuals;

(C) maintaining tight control to ensure that identifying data is kept securely; and

(D) ensuring that operational problems are promptly addressed by management.

(3) Requisite safety culture

Indicators of an effective safety culture typically include:

(i) top management's demonstrated commitment to promoting a proactive safety culture;

(ii) a non-punitive operator policy that covers the FDM programme;

(iii) FDM programme management by dedicated staff under the authority of the safety manager, with a high degree of specialisation and logistical support;

(iv) involvement of persons with appropriate expertise when identifying and assessing the risks (for example, pilots experienced on the aircraft type being analysed);

(v) monitoring fleet trends aggregated from numerous operations, not focusing only on specific events;

(vi) a well-structured system to protect the confidentiality of the data; and

(vii) an efficient communication system for disseminating hazard information (and subsequent risk assessments) internally and to other organisations to permit timely safety action.

(e) Implementing a FDM programme

(1) General considerations

(i) Typically, the following steps are necessary to implement a FDM programme:

(A) implementation of a formal agreement between management and flight crew;

(B) establishment and verification of operational and security procedures;

(C) installation of equipment;

(D) selection and training of dedicated and experienced staff to operate the programme; and

(E) commencement of data analysis and validation.

(ii) An operator with no FDM experience may need a year to achieve an operational FDM programme. Another year may be necessary before any safety and cost benefits appear. Improvements in the analysis software, or the use of outside specialist service providers, may shorten these time frames.

(2) Aims and objectives of a FDM programme

(i) As with any project there is a need to define the direction and objectives of the work. A phased approach is recommended so that the foundations are in place for possible subsequent expansion into other areas. Using a building block approach will allow expansion, diversification and evolution through experience.

(ii) Example: with a modular system, begin by looking at basic safety-related issues only. Add engine health monitoring, etc. in the second phase. Ensure compatibility with other systems.

(iii) A staged set of objectives starting from the first week's replay and moving through early production reports into regular routine analysis will contribute to a sense of achievement as milestones are met.

(iv) Examples of short-term, medium-term and long-term goals:

(A) Short-term goals:

- establish data download procedures, test replay software and identify aircraft defects;
- validate and investigate exceedance data; and
- establish a user-acceptable routine report format to highlight individual exceedances and facilitate the acquisition of relevant statistics.

(B) Medium-term goals:

- produce an annual report — include key performance indicators;
- add other modules to the analysis (e.g. continuing airworthiness); and
- plan for the next fleet to be added to programme.

(C) Long-term goals:

- network FDM information across all of the operator's safety information systems;
- ensure FDM provision for any proposed alternative training and qualification programme (ATQP); and
- use utilisation and condition monitoring to reduce spares holdings.

(v) Initially, focusing on a few known areas of interest will help prove the system's effectiveness. In contrast to an undisciplined 'scatter-gun' approach, a focused approach is more likely to gain early success.

(vi) Examples: rushed approaches, or rough runways at particular aerodromes. Analysis of such known problem areas may generate useful information for the analysis of other areas.

(3) The FDM team

(i) Experience has shown that the 'team' necessary to run a FDM programme could vary in size from one person for a small fleet, to a dedicated section for large fleets. The descriptions below identify various functions to be fulfilled, not all of which need a dedicated position.

(A) Team leader: it is essential that the team leader earns the trust and full support of both management and flight crew. The team leader acts independently of others in line management to make recommendations that will be seen by all to have a high level of integrity and impartiality. The individual requires good analytical, presentation and management skills.

(B) Flight operations interpreter: this person is usually a current pilot (or perhaps a recently retired senior captain or instructor), who knows the operator's route network and aircraft. This team member's in- depth knowledge of SOPs, aircraft handling characteristics, aerodromes and routes is used to place the FDM data in a credible context.

(C) Technical interpreter: this person interprets FDM data with respect to the technical aspects of the aircraft operation and is familiar with the power plant, structures and systems departments' requirements for information and any other engineering monitoring programmes in use by the operator.

(D) Gate-keeper: this person provides the link between the fleet or training managers and flight crew involved in events highlighted by FDM. The position requires good people skills and a positive attitude towards safety education. The person is typically a representative of the flight crew association or an 'honest broker' and is the only person permitted to connect the identifying data with the event. It is essential that this person earns the trust of both management and flight crew.

(E) Engineering technical support: this person is usually an avionics specialist, involved in the supervision of mandatory serviceability requirements for FDR systems. This team member is knowledgeable about FDM and the associated systems needed to run the programme.

(F) Replay operative and administrator: this person is responsible for the day-to-day running of the system, producing reports and analysis.

(ii) All FDM team members need appropriate training or experience for their respective area of data analysis. Each team member is allocated a realistic amount of time to regularly spend on FDM tasks.

EXAMPLE OF FDM EVENTS

The following table provides examples of FDM events that may be further developed using operator and aeroplane specific limits. The table is considered illustrative and not exhaustive. Other examples may be found in the documents published by the European Operators Flight Data Monitoring (EOFDM) forum.

Event Group	**Description**
Rejected take-off	High speed rejected take-off
Take-off pitch	Pitch rate low or high on take-off
	Pitch attitude high during take-off
Unstick speeds	Unstick speed high
	Unstick speed low
Height loss in climb-out	Initial climb height loss 20 ft above ground level (AGL) to 400 ft above aerodrome level (AAL)
	Initial climb height loss 400 ft to 1 500 ft AAL
Slow climb-out	Excessive time to 1 000 ft AAL after take-off
Climb-out speeds	Climb-out speed high below 400 ft AAL
	Climb-out speed high 400 ft AAL to 1 000 ft AAL
	Climb-out speed low 35 ft AGL to 400 ft AAL
	Climb-out speed low 400 ft AAL to 1 500 ft AAL
High rate of descent	High rate of descent below 2 000 ft AGL
Missed approach	Missed approach below 1 000 ft AAL
	Missed approach above 1 000 ft AAL
Low approach	Low on approach
Glideslope	Deviation under glideslope
	Deviation above glideslope (below 600 ft AGL)
Approach power	Low power on approach

Event Group	Description
Approach speeds	Approach speed high within 90 seconds of touchdown
	Approach speed high below 500 ft AAL
	Approach speed high below 50 ft AGL
	Approach speed low within 2 minutes of touchdown
Landing flap	Late land flap (not in position below 500 ft AAL)
	Reduced flap landing
	Flap load relief system operation
Landing pitch	Pitch attitude high on landing
	Pitch attitude low on landing
Bank angles	Excessive bank below 100 ft AGL
	Excessive bank 100 ft AGL to 500 ft AAL
	Excessive bank above 500 ft AGL
	Excessive bank near ground (below 20 ft AGL)
Normal acceleration	High normal acceleration on ground
	High normal acceleration in flight flaps up (+/- increment)
	High normal acceleration in flight flaps down(+/- increment)
	High normal acceleration at landing
Abnormal configuration	Take-off configuration warning
	Early configuration change after take-off (flap)
	Speed brake with flap
	Speed brake on approach below 800 ft AAL
	Speed brake not armed below 800 ft AAL

Event Group	Description
Ground proximity warning	Ground proximity warning system (GPWS) operation - hard warning
	GPWS operation — soft warning
	GPWS operation — windshear warning
	GPWS operation — false warning
Airborne collision avoidance system (ACAS II) warning	ACAS operation — Resolution Advisory
Margin to stall/buffet	Stick shake
	False stick shake
	Reduced lift margin except near ground
	Reduced lift margin at take-off
	Low buffet margin (above 20 000 ft)
Aircraft flight manual limitations	Maximum operating speed limit (V_{MO}) exceedance
	Maximum operating speed limit (M_{MO}) exceedance
	Flap placard speed exceedance
	Gear down speed exceedance
	Gear selection up/down speed exceedance
	Flap/slat altitude exceedance
	Maximum operating altitude exceedance

GM3 ORO.AOC.130 Flight data monitoring — aeroplanes

GUIDANCE AND INDUSTRY GOOD PRACTICE

(a) International Civil Aviation Organization (ICAO) Doc 10000 ‘Manual on Flight Data Analysis Programmes (FDAP)’; and
   (1) Additional guidance material for the establishment of flight data monitoring may be found in:
   (2) UK Civil Aviation Authority CAP 739 (Flight Data Monitoring).
(b) Examples of industry good practice for the establishment of flight data monitoring may be found in the documents published by the European Operators Flight Data Monitoring (EOFDM) forum.

AMC1 ORO.AOC.135(a) Personnel requirements

NOMINATED PERSONS

(a) The person may hold more than one of the nominated posts if such an arrangement is considered suitable and properly matched to the scale and scope of the operation.

(b) A description of the functions and the responsibilities of the nominated persons, including their names, should be contained in the operations manual.

(c) The holder of an AOC should make arrangements to ensure continuity of supervision in the absence of nominated persons.

(d) The person nominated by the holder of an AOC should not be nominated by another holder of an AOC, unless agreed with the competent authorities concerned.

(e) Persons nominated should be contracted to work sufficient hours to fulfil the management functions associated with the scale and scope of the operation.

AMC2 ORO.AOC.135(a) Personnel requirements

COMBINATION OF NOMINATED PERSON'S RESPONSIBILITIES

(a) The acceptability of a single person holding several posts, possibly in combination with being the accountable manager, should depend upon the nature and scale of the operation. The two main areas of concern should be competence and an individual's capacity to meet his/her responsibilities.

(b) As regards competence in different areas of responsibility, there should not be any difference from the requirements applicable to persons holding only one post.

(c) The capacity of an individual to meet his/her responsibilities should primarily be dependent upon the scale of the operation. However, the complexity of the organisation or of the operation may prevent, or limit, combinations of posts which may be acceptable in other circumstances.

(d) In most circumstances, the responsibilities of a nominated person should rest with a single individual. However, in the area of ground operations, it may be acceptable for responsibilities to be split, provided that the responsibilities of each individual concerned are clearly defined.

GM1 ORO.AOC.135(a) Personnel requirements

NOMINATED PERSONS

The smallest organisation that can be considered is the one-man organisation where all of the nominated posts are filled by the accountable manager, and audits are conducted by an independent person.

GM2 ORO.AOC.135(a) Personnel requirements

COMPETENCE OF NOMINATED PERSONS

(a) Nominated persons in accordance with ORO.AOC.135 should be expected to possess the experience and meet the qualification provisions of (b) to (f) respectively. Exceptionally, in particular cases, where the nominated person the Brunei DCA may accept a nomination that does not meet these provisions in full. In that circumstance, the nominee should have comparable experience and also the ability to perform effectively the functions associated with the post and with the scale of the operation.

(b) Nominated persons for flight operations, crew training and ground operations should have:

  (1) practical experience and expertise in the application of aviation safety standards and safe operating practices;

  (2) comprehensive knowledge of:

    (i) the applicable safety regulations and any associated requirements and procedures;

    (ii) the AOC holder's operations specifications; and

    (iii) the need for, and content of, the relevant parts of the AOC holder's operations manual;

  (3) familiarity with management systems preferably in the area of aviation;

  (4) appropriate management experience, preferably in a comparable organisation; and

  (5) 5 years of relevant work experience of which at least 2 years should be from the aeronautical industry in an appropriate position.

(c) Flight operations. The nominated person should hold or have held a valid flight crew licence and the associated ratings appropriate to a type of operation conducted under the AOC. In case the nominated person's licence and ratings are not current, his/her deputy should hold a valid flight crew licence and the associated ratings.

(d) Crew training. The nominated person or his/her deputy should be a current type rating instructor on a type/class operated under the AOC. The nominated person should have a thorough knowledge of the AOC holder's crew training concept for flight, cabin and when relevant other crew.

(e) Ground operations. The nominated person should have a thorough knowledge of the AOC holder's ground operations concept.

(f) Continuing airworthiness. The nominated person for continuing airworthiness or for the continuing airworthiness management contract, as the case may be should have the relevant knowledge, background and experience in accordance with relevant airworthiness requirements. If a continuing airworthiness management organisation (CAMO) is contracted by the operator pursuant to point M.A.201(ea) of Annex I (Part-M) to Regulation (EU) No 1321/2014, please refer to AMC1 ORO.AOC.135(a)(4).

AMC1 ORO.AOC.135(a)(4) Personnel requirements

NOMINATED PERSON RESPONSIBLE FOR THE MANAGEMENT AND SUPERVISION OF THE CONTRACT WITH A CAMO PURSUANT TO POINT M.A.201(ea)

If the operator concludes a contract with a CAMO pursuant to point M.A.201(ea) of BAR 8 Part-M, the person nominated by the operator in accordance with point ORO.AOC.135(a)(4) is responsible for the management and supervision of the continuing airworthiness management contract that is required by Appendix I to Part-M. This person should not be employed by the contracted CAMO to avoid conflict of interest. In addition, this person should have the following:

(a) practical experience and expertise in the application of aviation safety standards and safe operating practices;

(b) comprehensive knowledge of:

  (i) the relevant parts of operational requirements and procedures;

  (ii) the air operator certificate (AOC) holder's operations specifications;

  (iii) the relevant parts of the AOC holder's operations manual; and

  (iv) the relevant parts of the continuing airworthiness management exposition (CAME) of the contracted CAMO;

(c) knowledge of:

  (i) human factors (HF) principles; and

  (ii) safety management system (SMS) based on the EU management system requirements (including compliance monitoring) and International Civil Aviation Organization (ICAO) Annex 19;

(d) 5 years of relevant work experience, of which at least 2 years in an appropriate position in the aeronautical industry;

(e) a relevant engineering or technical degree, or an aircraft maintenance technician qualification with additional education that is acceptable to the competent authority; this condition may be replaced by 3 years of experience in addition to those specified in point (d); those 3 years should include an appropriate combination of experience in tasks related to aircraft maintenance and/or continuing airworthiness management and/or surveillance of such tasks;

(f) thorough knowledge of:

  (i) the continuing airworthiness management contract;

  (ii) the organisation's management systems' interfaces; and

  (iii) the way of achieving harmonisation of those management systems;

(g) knowledge of a relevant sample of the type(s) of aircraft operated by the organisation, which is gained through a formalised training course; such a course should be at least at a level equivalent to Part-66 (Annex III to Regulation (EU) No 1321/2014), Appendix III, Level 1 'General Familiarisation' and may be provided by a Part-147 (Annex IV to Regulation (EU) No 1321/2014) organisation, by the manufacturer, by the CAMO, or by any other organisation that is accepted by the competent authority; 'relevant sample' means that the related course should cover typical aircraft and aircraft systems that are operated by the organisation; and

(h) knowledge of Regulation (EU) No 1321/2014.

GM1 ORO.AOC.135(a)(4) Personnel requirements

NOMINATED PERSON RESPONSIBLE FOR THE MANAGEMENT AND SUPERVISION OF THE CONTRACT WITH A CAMO PURSUANT TO POINT M.A.201(ea)

If the operator concludes a contract with a CAMO pursuant to point M.A.201(ea) of Annex I (Part-M) to Regulation (EU) No 1321/2014, the person nominated by the operator in accordance with point ORO.AOC.135(a)(4) is responsible for ensuring that both the operator and CAMO fulfil their obligations as specified in the contract (which is established in accordance with Appendix I to Part-M). In the particular context of a single air carrier business grouping, that person is expected to apply critical thinking, to be impartial, and not complacent about the fact that the CAMO belongs to that business grouping.

GM1 ORO.AOC.140(b);(c) Facility requirements

VFR DAY OPERATIONS WITH AEROPLANES WITH A MOPSC OF LESS THAN 7 AND HELICOPTERS WITH A MOPSC OF LESS THAN 5 TAKING OFF AND LANDING AT THE SAME AERODROME OR OPERATING SITE

Taking into account the size of the operator and the type of operations, appropriate facilities may consist in arrangements for:

(a) suitable office accommodation for the nominated person(s), as requested by ORO.AOC.135, and

(b) adequate working space for the flight preparation to be performed by the flight crew.

Subpart DEC - Declaration

AMC1 ORO.DEC.100(d) Declaration

CHANGES

The new declaration should be submitted before the change becomes effective indicating the date as of which the change would apply.

GM1 ORO.DEC.100 Declaration

GENERAL

The intent of the declaration is to:

(a) have the operator acknowledge its responsibilities under the applicable safety regulations and that it holds all necessary approvals;

(b) inform the Brunei DCA of the existence of an operator; and

(c) enable the Brunei DCA to fulfil its oversight responsibilities in accordance with ARO.GEN.300 and 305.

MANAGED OPERATIONS

When the non-commercial operation of a complex motor-powered aircraft is managed by a third party on behalf of the owner, that party may be the operator in the sense of the Civil Aviation Regulations 2006 and therefore has to declare its capability and means to discharge the responsibilities associated with the operation of the aircraft to the Brunei DCA.

In such a case, it should also be assessed whether the third party operator undertakes a commercial operation in the sense of the Civil Aviation Regulations 2006.

AMC1 ORO.DEC.100(a);(d) Declaration

RELEVANT INFORMATION PRIOR TO COMMENCING OPERATION, AND NOTIFICATION OF ANY CHANGES TO DECLARATION — EFVS 200 OPERATIONS

Declarations involving EFVS 200 operations (under NCC.OP.235 or SPO.OP.235) should be submitted at least 60 days before the new declaration or any change becomes effective, and indicate the date as of which they would apply.

GM1 ORO.DEC.100(a);(d) Declaration

RELEVANT INFORMATION PRIOR TO COMMENCING OPERATION, AND NOTIFICATION OF ANY CHANGES TO DECLARATION — EFVS 200 OPERATIONS

(a) When a declaration involves EFVS 200 operations in accordance with NCC.OP.235 or SPO.OP.235, the competent authority should be enabled to fulfil its responsibilities in accordance with ARO.GEN.345 prior to starting these operations or implementing changes to such EFVS 200 operations.

(b) In accordance with ORO.DEC.100 points (a) and (d), the operator shall provide all relevant information and notify any changes. In relation to EFVS 200, this may be but is not limited to:

    (1) AFM or additional data from the TC/STC holder;

    (2) established relevant aerodrome operating minima;

    (3) documented operating procedures;

    (4) training and checking programmes;

    (5) minimum equipment list (MEL) for the operations to be undertaken; and

    (6) processes to ensure that only runways and instrument procedures suitable for the intended operations are used.

Subpart SPO – Commercial Specialised Operations

AMC1 ORO.SPO.100(a) Personnel requirements

NOMINATED PERSONS

(a) The person may hold more than one of the nominated posts if such an arrangement is considered suitable and properly matched to the scale and scope of the commercial specialised operation.

(b) A description of the functions and the responsibilities of the nominated persons, including their names, should be contained in the operations manual.

(c) A commercial specialised operator should make arrangements to ensure continuity of supervision in the absence of nominated persons.

(d) The person nominated by a commercial specialised operator should normally not be nominated by another commercial specialised operator.

(e) Persons nominated should be contracted to work sufficient hours to fulfil the management functions associated with the scale and scope of the commercial specialised operation.

AMC2 ORO.SPO.100(a) Personnel requirements

COMBINATION OF NOMINATED PERSON'S RESPONSIBILITIES

(a) The acceptability of a single person holding several posts, possibly in combination with being the accountable manager, should depend upon the nature and scale of the commercial specialised operation. The two main areas of concern should be competence and an individual's capacity to meet his/her responsibilities.

(b) As regards competence in different areas of responsibility, there should not be any difference from the requirements applicable to persons holding only one post.

(c) The capacity of an individual to meet his/her responsibilities should primarily be dependent upon the scale of the commercial specialised operation. However, the complexity of the organisation or of the operation may prevent, or limit, combinations of posts which may be acceptable in other circumstances.

(d) In most circumstances, the responsibilities of a nominated person should rest with a single individual. However, in the area of ground operations, it may be acceptable for responsibilities to be split, provided that the responsibilities of each individual concerned are clearly defined.

GM1 ORO.SPO.100(a) Personnel requirements

NOMINATED PERSONS

The smallest organisation that can be considered is the one-man organisation where all of the nominated posts are filled by the accountable manager, and audits are conducted by an independent person.

GM2 ORO.SPO.100(a) Personnel requirements

COMPETENCE OF NOMINATED PERSONS

(a) Nominated persons in accordance with ORO.AOC.135 should normally be expected to possess the experience and meet the licensing provisions that are listed in (b) to (f). There may be exceptional cases where not all of the provisions can be met. In that circumstance, the nominee should have comparable experience and also the ability to perform effectively the functions associated with the post and with the scale of the specialised operation.

(b) Nominated persons should have:

  (1) practical experience and expertise in the application of aviation safety standards and safe operating practices;

  (2) comprehensive knowledge of:

    (i) the applicable safety regulations and any associated requirements and procedures;

    (ii) the operator's high-risk specialised operation authorisation, if applicable; and

    (iii) the need for, and content of, the relevant parts of the commercial specialised operator's operations manual;

  (3) familiarity with management systems preferably in the area of aviation;

  (4) appropriate management experience, preferably in a comparable organisation; and

(5) 5 years of relevant work experience of which at least 2 years should be from the aeronautical industry in an appropriate position.

(c) Flight operations. The nominated person should hold or have held a valid flight crew licence and the associated ratings appropriate to the type of commercial specialised operations conducted by the operator. In case the nominated person's licence and ratings are not current, his/her deputy should hold a valid flight crew licence and the associated ratings.

(d) Crew training. The nominated person or his/her deputy should be a current type rating instructor on a type/class operated by the commercial specialised operator. The nominated person should have a thorough knowledge of the operator's crew training concept for flight crew and when relevant other crew.

(e) Ground operations. The nominated person should have a thorough knowledge of the commercial specialised operator's ground operations concept.

(f) Continuing airworthiness. The nominated person should have the relevant knowledge and appropriate experience requirements related to aircraft continuing airworthiness as detailed in Part-M.

AMC1 ORO.SPO.100(c) Common requirements for commercial specialised operators

LEASING OF THIRD COUNTRY OPERATOR OR AIRCRAFT — INFORMATION TO BE PROVIDED TO THE Brunei DCA

The operator intending to lease-in an aircraft or operator should provide the Brunei DCA with the following information:

(a) the aircraft type, registration markings and serial number;

(b) the name and address of the registered owner;

(c) a copy of the valid certificate of airworthiness;

(d) a copy of the lease agreement or description of the lease provisions, except financial arrangements;

(e) duration of the lease.

The information mentioned above should be accompanied by a statement signed by the lessee that the parties to the lease agreement fully understand their respective responsibilities under the applicable regulations.

GM1 ORO.SPO.100(c) Common requirements for commercial specialised operators

LEASE AGREEMENTS BETWEEN OPERATORS REGISTERED IN THE Brunei Darussalam

No approval is required for any lease agreements between operators having their principle place of business in the Brunei Darussalam.

AMC1 ORO.SPO.100(c)(1) Common requirements for commercial specialised operators

WET LEASE-IN OF AN AIRCRAFT REGISTERED IN A THIRD COUNTRY

If the operator is not intending to apply the Brunei Darussalam safety requirements for air operations and continuing airworthiness when wet leasing-in an aircraft registered in a third country, it should demonstrate to the Brunei DCA that the standards complied with are equivalent to the following requirements:

(a) Part-SPO;

(b) Part-ORO:

(1) ORO.GEN.110 and Section 2 of Subpart GEN;

(2) ORO.MLR, excluding ORO.MLR.105;

(3) ORO.FC;

(c) Part-SPA, if applicable;

(d) for continuing airworthiness management of the third country operator, BAR 8 Part-M Subpart-B, Subpart-C and Subpart-G, excluding M.A.707, and M.A.710;

(e) for the maintenance organisation used by the third country operator during the lease period: Part-145; and

(f) the operator should provide the Brunei DCA with a full description of the operating procedures and safety assessment demonstrating compliance with the requirements safety objectives set out in points (b) (1)-(3).

AMC2 ORO.SPO.100(c)(1) Common requirements for commercial specialised operators

WET LEASE-IN

The lessee should maintain a record of occasions when lessors are used, for inspection by the Brunei DCA.

GM1 ORO.SPO.100(c)(1) Common requirements for commercial specialised operators

SHORT-TERM WET LEASE-IN

In anticipation of an operational need the operator may enter into a framework agreement with more than one third country operator provided that these operators comply with ORO.SPO.110 (c). These third country operators should be placed in a list maintained by the lessee.

GM1 ORO.SPO.110(a) Authorisation of high-risk commercial specialised operations

DECLARATION/AUTHORISATION

Any commercial specialised operator should declare its activity to its Brunei DCA, as required by ORO.DEC.100.

GM2 ORO.SPO.110(a) Authorisation of high-risk commercial specialised operations

VALIDITY OF THE AUTHORISATION

The operator may submit an application to the Brunei DCA for a single event, a defined series of flights or for an unlimited duration, depending on the type of operations foreseen.

GM1 ORO.SPO.115(a) Changes

GENERAL

Any change to information contained in the authorisation, but not leading to an amendment of the SOPs or the operator's risk assessment should be notified by the commercial specialised operator to the Brunei DCA which should amend the authorisation.

Subpart MLR - Manuals Logs and Records

AMC1 ORO.MLR.100 Operations manual — general

GENERAL

(a) The operations manual (OM) may vary in detail according to the complexity of the operation and of the type and number of aircraft operated.

(b) The OM or parts thereof may be presented in any form, including electronic form. In all cases, the accessibility, usability and reliability should be assured.

(c) The OM should be such that:

(1) all parts of the manual are consistent and compatible in form and content;

(2) the manual can be readily amended; and

(3) the content and amendment status of the manual is controlled and clearly indicated.

(d) The OM should include a description of its amendment and revision process specifying:

(1) the person(s) who may approve amendments or revisions;

(2) the conditions for temporary revisions and/or immediate amendments or revision required in the interest of safety; and

(3) the methods by which operator personnel are advised of the changes.

(e) The OM content may be based on, or may refer to, industry codes of practice.

(f) When compiling an OM, the operator may take advantage of the contents of other relevant documents. Material produced by the operator for the type-related part of the OM may be supplemented with, or substituted by, applicable parts of the aircraft flight manual (AFM) or, where such a document exists, by an aircraft operating manual produced by the manufacturer of the aircraft.

(g) In the case of commercial operations with other-than-complex motor-powered aircraft or non-commercial operations, a 'pilot operating handbook' (POH), or equivalent document, may be used as the type-related part of the OM, provided that the POH covers the normal and abnormal/emergency operating procedures.

(h) For the route and aerodrome part of the OM, material produced by the operator may be supplemented with or substituted by applicable route guide material produced by a specialist company.

(i) If the operator chooses to use material from another source in the OM, either the applicable material should be copied and included directly in the relevant part of the OM, or the OM should contain a reference to the appropriate section of that applicable material.

(j) If the operator chooses to make use of material from another source (e.g. a route manual producer, an aircraft manufacturer or a training organisation), this does not absolve the operator from the responsibility of verifying the applicability and suitability of this material. Any material received from an external source should be given its status by a statement in the OM.

AMC2 ORO.MLR.100 Operations manual — general

CONTENTS OF THE OPERATIONS MANUAL FOR CERTAIN TYPES OF OPERATIONS

For non-commercial operations with complex motor-powered aircraft, or CAT operations with either single-engined propeller-driven aeroplanes with an MOPSC of 5 or less, or single-engined non-complex helicopters with an MOPSC of 5 or less, taking off and landing at the same aerodrome or operating site, under VFR by day and CAT operations with sailplanes and balloons, the OM should contain at least the following information, where applicable:

(a) Table of contents;

(b) Amendment control status and list of effective pages or paragraphs, unless the entire manual is re-issued and the manual has an effective date on it;

(c) Duties, responsibilities and succession of management and operating personnel;

(d) Description of the management system;

(e) Operational control system;

(f) Flight time limitations;

(g) Standard operating procedures (SOPs);

(h) Weather limitations;

(i) Emergency procedures;

(j) Accidents/incidents considerations;

(k) Security procedures;

(l) Minimum equipment list (MEL);

(m) Personnel qualifications and training;

(n) Record-keeping;

(o) Normal flight operations;

(p) Performance operating limitations;

(q) Procedures for the preservation of recordings of the flight recorders in order to prevent inadvertent reactivation, repair or reinstallation of the flight recorders following an accident or a serious incident or when this preservation is directed by the investigating authority.

(r) Handling of dangerous goods.

AMC3 ORO.MLR.100 Operations manual — general

CONTENTS — CAT OPERATIONS

(a) The OM should contain at least the following information, where applicable, as relevant for the area and type of operation:

A General/Basic

0 ADMINISTRATION AND CONTROL OF THE OPERATIONS MANUAL

0.1 Introduction:

(a) A statement that the manual complies with all applicable regulations and with the terms and conditions of the applicable AOC.

(b) A statement that the manual contains operational instructions that are to be complied with by the relevant personnel.

(c) A list and brief description of the various parts, their contents, applicability and use.

(d) Explanations and definitions of terms and words needed for the use of the manual.

0.2 System of amendment and revision:

(a) Details of the person(s) responsible for the issuance and insertion of amendments and revisions.

(b) A record of amendments and revisions with insertion dates and effective dates.

(c) A statement that handwritten amendments and revisions are not permitted, except in situations requiring immediate amendment or revision in the interest of safety.

(d) A description of the system for the annotation of pages or paragraphs and their effective dates.

(e) A list of effective pages or paragraphs.

(f) Annotation of changes (in the text and, as far as practicable, on charts and diagrams).

(g) Temporary revisions.

(h) A description of the distribution system for the manuals, amendments and revisions.

1 Organisation and responsibilities

1.1 Organisational structure. A description of the organisational structure, including the general organogram and operations departments' organograms. The organogram should depict the relationship between the operations departments and the other departments of the operator. In particular, the subordination and reporting lines of all divisions, departments, etc., which pertain to the safety of flight operations, should be shown.

1.2 Nominated persons. The name of each nominated person responsible for flight operations, crew training and ground operations, as prescribed in ORO.AOC.135. A description of their function and responsibilities should be included.

1.3 Responsibilities and duties of operations management personnel. A description of the duties, responsibilities and authority of operations management personnel pertaining to the safety of flight operations and the compliance with the applicable regulations.

1.4 Authority, duties and responsibilities of the pilot-in-command/commander. A statement defining the authority, duties and responsibilities of the pilot-in- command/commander.

1.5 Duties and responsibilities of crew members other than the pilot-in- command/commander.

2 Operational control and supervision

2.1 Supervision of the operation by the operator. A description of the system for supervision of the operation by the operator (see ORO.GEN.110(c)). This should show how the safety of flight operations and the qualifications of personnel are supervised. In particular, the procedures related to the following items should be described:

(a) licence and qualification validity,

(b) competence of operations personnel,

(c) control, analysis and storage of the required records.

2.2 System and responsibility for promulgation of additional operational instructions and information. A description of any system for promulgating information which may be of an operational nature, but which is supplementary to that in the OM. The applicability of this information and the responsibilities for its promulgation should be included.

2.3 Operational control. A description of the procedures and responsibilities necessary to exercise operational control with respect to flight safety.

2.4 Powers of the authority. A description of the powers of the Brunei DCA and guidance to staff on how to facilitate inspections by authority personnel.

3 Management System

A description of the management system, including at least the following:

(a) safety policy;

(b) the process for identifying safety hazards and for evaluating and managing the associated risks;

(c) compliance monitoring system;

(d) allocation of duties and responsibilities;

(e) documentation of all key management system processes.

4 Crew composition

4.1 Crew composition. An explanation of the method for determining crew compositions, taking account of the following:

(a) the type of aircraft being used;

(b) the area and type of operation being undertaken;

(c) the phase of the flight;

(d) the minimum crew requirement and flight duty period planned;

(e) experience (total and on type), recency and qualification of the crew members;

(f) the designation of the pilot-in-command/commander and, if necessitated by the duration of the flight, the procedures for the relief of the pilot-in- command/commander or other members of the flight crew (see ORO.FC.105);

(g) the designation of the senior cabin crew member and, if necessitated by the duration of the flight, the procedures for the relief of the senior cabin crew member and any other member of the cabin crew.

4.2 Designation of the pilot-in-command/commander. The rules applicable to the designation of the pilot-in-command/commander.

4.3 Flight crew incapacitation. Instructions on the succession of command in the event of flight crew incapacitation.

4.4 Operation on more than one type. A statement indicating which aircraft are considered as one type for the purpose of:

(a) flight crew scheduling; and

(b) cabin crew scheduling.

5 Qualification requirements

5.1 A description of the required licence, rating(s), qualification/competency (e.g. for routes and aerodromes), experience, training, checking and recency for operations personnel to conduct their duties. Consideration should be given to the aircraft type, kind of operation and composition of the crew.

5.2 Flight crew:

(a) pilot-in-command/commander,

(b) pilot relieving the pilot-in-command/commander,

(c) co-pilot,

(d) pilot relieving the co-pilot,

(e) pilot under supervision,

(f) system panel operator,

(g) operation on more than one type or variant.

5.3 Cabin crew:

(a) senior cabin crew member,

(b) cabin crew member:

(i) required cabin crew member,

(ii) additional cabin crew member and cabin crew member during familiarisation flights,

(c) operation on more than one type or variant.

5.4 Training, checking and supervision personnel:

(a) for flight crew; and

(b) for cabin crew.

5.5 Other operations personnel (including technical crew and crew members other than flight, cabin and technical crew).

6 Crew health precautions

6.1 Crew health precautions. The relevant regulations and guidance to crew members concerning health, including the following:

(a) alcohol and other intoxicating liquids,

(b) narcotics,

(c) drugs,

(d) sleeping tablets,

(e) anti-depressants,

(f) pharmaceutical preparations,

(g) immunisation,

(h) deep-sea diving,

(i) blood/bone marrow donation,

(j) meal precautions prior to and during flight,

(k) sleep and rest,

(l) surgical operations.

7 Flight time limitations

7.1 Flight and duty time limitations and rest requirements.

7.2 Exceedance of flight and duty time limitations and/or reductions of rest periods. Conditions under which flight and duty time may be exceeded or rest periods may be reduced, and the procedures used to report these modifications.

8 Operating procedures

8.1 Flight preparation instructions. As applicable to the operation:

8.1.1 Minimum flight altitudes. A description of the method of determination and application of minimum altitudes including:

(a) a procedure to establish the minimum altitudes/flight levels for visual flight rules (VFR) flights; and

(b) a procedure to establish the minimum altitudes/flight levels for instrument flight rules (IFR) flights.

8.1.2 Criteria and responsibilities for determining the adequacy of aerodromes to be used.

8.1.3 Methods and responsibilities for establishing aerodrome operating minima. Reference should be made to procedures for the determination of the visibility and/or runway visual range (RVR) and for the applicability of the actual visibility observed by the pilots, the reported visibility and the reported RVR.

8.1.4 En-route operating minima for VFR flights or VFR portions of a flight and, where single-engined aircraft are used, instructions for route selection with respect to the availability of surfaces that permit a safe forced landing.

8.1.5 Presentation and application of aerodrome and en-route operating minima.

8.1.6 Interpretation of meteorological information. Explanatory material on the decoding of meteorological (MET) forecasts and MET reports relevant to the area of operations, including the interpretation of conditional expressions.

8.1.7 Determination of the quantities of fuel, oil and water methanol carried. The methods by which the quantities of fuel, oil and water methanol to be carried are determined and monitored in-flight. This section should also include instructions on the measurement and distribution of the fluid carried on board. Such instructions should take account of all circumstances likely to be encountered on the flight, including the possibility of in-flight re-planning and of failure of one or more of the aircraft's power plants. The system for maintaining fuel and oil records should also be described.

8.1.8 Mass and centre of gravity. The general principles of mass and centre of gravity including the following:

(a) definitions;

(b) methods, procedures and responsibilities for preparation and acceptance of mass and centre of gravity calculations;

(c) the policy for using standard and/or actual masses;

(d) the method for determining the applicable passenger, baggage and cargo mass;

(e) the applicable passenger and baggage masses for various types of operations and aircraft type;

(f) general instructions and information necessary for verification of the various types of mass and balance documentation in use;

(g) last-minute changes procedures;

(h) specific gravity of fuel, oil and water methanol;

(i) seating policy/procedures;

(j) for helicopter operations, standard load plans.

8.1.9 Air traffic services (ATS) flight plan. Procedures and responsibilities for the preparation and submission of the ATS flight plan. Factors to be considered include the means of submission for both individual and repetitive flight plans.

8.1.10 Operational flight plan. Procedures and responsibilities for the preparation and acceptance of the operational flight plan. The use of the operational flight plan should be described, including samples of the operational flight plan formats in use.

8.1.11 Operator's aircraft technical log. The responsibilities and the use of the operator's aircraft technical log should be described, including samples of the format used.

8.1.12 List of documents, forms and additional information to be carried.

8.1.13 For commercial air transport operations with single-engined turbine aeroplanes in instrument meteorological conditions or at night (CAT SET-IMC) approved in accordance with Subpart L (SET-IMC) of Annex V (Part-SPA)

(a) the procedure for route selection with respect to the availability of surfaces, which permits a safe forced landing;

(b) the instructions for the assessment of landing sites (elevation, landing direction, and obstacles in the area); and

(c) the instructions for the assessment of the weather conditions at those landing sites.

8.2 Ground handling instructions. As applicable to the operation:

8.2.1 Fuelling procedures. A description of fuelling procedures, including:

(a) safety precautions during refuelling and defuelling including when an aircraft auxiliary power unit is in operation or for helicopters, when rotors are turning or, for aeroplanes when an engine is running;

(b) refuelling and defuelling when passengers are embarking, on board or disembarking; and

(c) precautions to be taken to avoid mixing fuels.

8.2.2 Aircraft, passengers and cargo handling procedures related to safety. A description of the handling procedures to be used when allocating seats, embarking and disembarking passengers and when loading and unloading the aircraft. Further procedures, aimed at achieving safety whilst the aircraft is on the ramp, should also be given. Handling procedures should include:

(a) special categories of passengers, including children/infants, persons with reduced mobility, inadmissible passengers, deportees and persons in custody;

(b) permissible size and weight of hand baggage;

(c) loading and securing of items in the aircraft;

(d) positioning of ground equipment;

(e) operation of aircraft doors;

(f) safety on the aerodrome/operating site, including fire prevention and safety in blast and suction areas;

(g) start-up, ramp departure and arrival procedures, including, for aeroplanes, push-back and towing operations;

(h) servicing of aircraft;

(i) documents and forms for aircraft handling;

(j) special loads and classification of load compartments; and

(k) multiple occupancy of aircraft seats.

8.2.3 Procedures for the refusal of embarkation. Procedures to ensure that persons who appear to be intoxicated, or who demonstrate by manner or physical indications that they are under the influence of drugs, are refused embarkation. This does not apply to medical patients under proper care.

8.2.4 De-icing and anti-icing on the ground. A description of the de-icing and anti-icing policy and procedures for aircraft on the ground. These should include descriptions of the types and effects of icing and other contaminants on aircraft whilst stationary, during ground movements and during take-off. In addition, a description of the fluid types used should be given, including the following:

(a) proprietary or commercial names,

(b) characteristics,

(c) effects on aircraft performance,

(d) hold-over times,

(e) precautions during usage.

8.3 Flight Procedures:

8.3.1 VFR/IFR Policy. A description of the policy for allowing flights to be made under VFR, or for requiring flights to be made under IFR, or for changing from one to the other.

8.3.2 Navigation Procedures. A description of all navigation procedures, relevant to the type(s) and area(s) of operation. Special consideration should be given to:

(a) standard navigational procedures, including policy for carrying out independent cross-checks of keyboard entries where these affect the flight path to be followed by the aircraft; and

(b) required navigation performance (RNP), minimum navigation performance specification (MNPS) and polar navigation and navigation in other designated areas;

(c) in-flight re-planning;

(d) procedures in the event of system degradation; and

(e) reduced vertical separation minima (RVSM), for aeroplanes.

8.3.3 Altimeter setting procedures, including, where appropriate, use of:

(a) metric altimetry and conversion tables; and

(b) QFE operating procedures.

8.3.4 Altitude alerting system procedures for aeroplanes or audio voice alerting devices for helicopters.

8.3.5 Ground proximity warning system (GPWS)/terrain avoidance warning system (TAWS), for aeroplanes. Procedures and instructions required for the avoidance of controlled flight into terrain, including limitations on high rate of descent near the surface (the related training requirements are covered in OM-D 2.1).

8.3.6 Policy and procedures for the use of traffic collision avoidance system (TCAS)/airborne collision avoidance system (ACAS) for aeroplanes and, when applicable, for helicopters.

8.3.7 Policy and procedures for in-flight fuel management.

8.3.8 Adverse and potentially hazardous atmospheric conditions. Procedures for operating in, and/or avoiding, adverse and potentially hazardous atmospheric conditions, including the following:

(a) thunderstorms,

(b) icing conditions,

(c) turbulence,

(d) windshear,

(e) jet stream,

(f) volcanic ash clouds,

(g) heavy precipitation,

(h) sand storms,

(i) mountain waves,

(j) significant temperature inversions.

8.3.9 Wake turbulence. Wake turbulence separation criteria, taking into account aircraft types, wind conditions and runway/final approach and take-off area (FATO) location. For helicopters, consideration should also be given to rotor downwash.

8.3.10 Crew members at their stations. The requirements for crew members to occupy their assigned stations or seats during the different phases of flight or whenever deemed necessary in the interest of safety and, for aeroplane operations, including procedures for controlled rest in the flight crew compartment.

8.3.11 Use of restraint devices for crew and passengers. The requirements for crew members and passengers to use safety belts and/or restraint systems during the different phases of flight or whenever deemed necessary in the interest of safety.

8.3.12 Admission to flight crew compartment. The conditions for the admission to the flight crew compartment of persons other than the flight crew. The policy regarding the admission of inspectors from an authority should also be included.

8.3.13 Use of vacant crew seats. The conditions and procedures for the use of vacant crew seats.

8.3.14 Incapacitation of crew members. Procedures to be followed in the event of incapacitation of crew members in-flight. Examples of the types of incapacitation and the means for recognising them should be included.

8.3.15 Cabin safety requirements. Procedures:

(a) covering cabin preparation for flight, in-flight requirements and preparation for landing, including procedures for securing the cabin and galleys;

(b) to ensure that passengers are seated where, in the event that an emergency evacuation is required, they may best assist and not hinder evacuation from the aircraft;

(c) to be followed during passenger embarkation and disembarkation;

(d) when refuelling/defuelling with passengers embarking, on board or disembarking;

(e) covering the carriage of special categories of passengers;

(f) covering smoking on board;

(g) covering the handling of suspected infectious diseases.

8.3.16 Passenger briefing procedures. The contents, means and timing of passenger briefing in accordance with Part-CAT.

8.3.17 Procedures for aircraft operated whenever required cosmic or solar radiation detection equipment is carried.

8.3.18 Policy on the use of autopilot and autothrottle for aircraft fitted with these systems.

8.4 Low visibility operations (LVO). A description of the operational procedures associated with LVO.

8.5 Extended-range operations with two-engined aeroplanes (ETOPS). A description of the ETOPS operational procedures. (Refer to EASA AMC 20-6)

8.6 Use of the minimum equipment and configuration deviation list(s).

8.7 Non-commercial operations. Information as required by ORO.AOC.125 for each type of non-commercial flight performed by the AOC holder. A description of the differences from CAT operations. Procedures and limitations, for example, for the following:

(a) training flights,

(b) flights at the end of lease or upon transfer of ownership,

(c) delivery flights,

(d) ferry flights,

(e) demonstration flights,

(f) positioning flights,

(g) other non-commercial flights.

8.8 Oxygen requirements:

8.8.1 An explanation of the conditions under which oxygen should be provided and used.

8.8.2 The oxygen requirements specified for the following persons:

(a) flight crew;

(b) cabin crew;

(c) passengers.

8.9 procedures related to the use of type B EFB applications:

9 Dangerous goods and weapons

9.1 Information, instructions and general guidance on the transport of dangerous goods, in accordance with Subpart G of Part SPA (SPA.DG), including:

(a) operator's policy on the transport of dangerous goods;

(b) guidance on the requirements for acceptance, labelling, handling, stowage and segregation of dangerous goods;

(c) special notification requirements in the event of an accident or occurrence when dangerous goods are being carried;

(d) procedures for responding to emergency situations involving dangerous goods;

(e) duties of all personnel involved; and

(f) instructions on the carriage of the operator's personnel on cargo aircraft when dangerous goods are being carried.

9.2 The conditions under which weapons, munitions of war and sporting weapons may be carried.

10 Security

Security instructions, guidance, procedures, training and responsibilities. Some parts of the security instructions and guidance may be kept confidential.

11 Handling, notifying and reporting accidents, incidents and occurrences and using the CVR recording

Procedures for handling, notifying and reporting accidents, incidents and occurrences. This section should include the following:

(a) definition of accident, incident and occurrence and of the relevant responsibilities of all persons involved;

(b) illustrations of forms to be used for reporting all types of accident, incident and occurrence (or copies of the forms themselves), instructions on how they are to be completed, the addresses to which they should be sent and the time allowed for this to be done;

(c) in the event of an accident, descriptions of which departments, authorities and other organisations have to be notified, how this will be done and in what sequence;

(d) procedures for verbal notification to air traffic service units of incidents involving ACAS resolution advisories (RAs), bird hazards, dangerous goods and hazardous conditions;

(e) procedures for submitting written reports on air traffic incidents, ACAS RAs, bird strikes, dangerous goods incidents or accidents, and unlawful interference;

(f) reporting procedures. These procedures should include internal safety- related reporting procedures to be followed by crew members, designed to ensure that the pilot-in-command/commander is informed immediately of any incident that has endangered, or may have endangered, safety during the flight, and that the pilot-in-command/commander is provided with all relevant information.

(g) Procedures for the preservation of recordings of the flight recorders following an accident or a serious incident or when so directed by the investigating authority. These procedures should include:

(1) a full quotation of point (a) of CAT.GEN.MPA.195(a); and

(2) instructions and means to prevent inadvertent reactivation, repair or reinstallation of the flight recorders by personnel of the operator or of third parties, and to ensure that flight recorder recordings are preserved for the needs of the investigating authority.

(h) Procedures required by CAT.GEN.MPA.195 for using the CVR recording or its transcript

12 Rules of the air

(a) Visual and instrument flight rules,

(b) Territorial application of the rules of the air,

(c) Communication procedures, including communication-failure procedures,

(d) Information and instructions relating to the interception of civil aircraft,

(e) The circumstances in which a radio listening watch is to be maintained,

(f) Signals,

(g) Time system used in operation,

(h) ATC clearances, adherence to flight plan and position reports,

(i) Visual signals used to warn an unauthorised aircraft flying in or about to enter a restricted, prohibited or danger area,

(j) Procedures for flight crew observing an accident or receiving a distress transmission,

(k) The ground/air visual codes for use by survivors, and description and use of signal aids,

(l) Distress and urgency signals.

13 Leasing/code-share

A description of the operational arrangements for leasing and code-share, associated procedures and management responsibilities.

B Aircraft operating matters — type related

Taking account of the differences between types/classes, and variants of types, under the following headings:

0 General information and units of measurement

0.1 General information (e.g. aircraft dimensions), including a description of the units of measurement used for the operation of the aircraft type concerned and conversion tables.

1 Limitations

1.1 A description of the certified limitations and the applicable operational limitations should include the following:

(a) certification status (e.g. EASA (supplemental) type certificate, environmental certification, etc.);

(b) passenger seating configuration for each aircraft type, including a pictorial presentation;

(c) types of operation that are approved (e.g. VFR/IFR, CAT II/III, RNP, flights in known icing conditions, etc.);

(d) crew composition;

(e) mass and centre of gravity;

(f) speed limitations;

(g) flight envelope(s);

(h) wind limits, including operations on contaminated runways;

(i) performance limitations for applicable configurations;

(j) (runway) slope;

(k) for aeroplanes, limitations on wet or contaminated runways;

(l) airframe contamination;

(m) system limitations.

2 Normal Procedures

The normal procedures and duties assigned to the crew, the appropriate checklists, the system for their use and a statement covering the necessary coordination procedures between flight and cabin/other crew members. The normal procedures and duties should include the following:

(a) pre-flight,

(b) pre-departure,

(c) altimeter setting and checking,

(d) taxi, take-off and climb,

(e) noise abatement,

(f) cruise and descent,

(g) approach, landing preparation and briefing,

(h) VFR approach,

(i) IFR approach,

(j) visual approach and circling,

(k) missed approach,

(l) normal landing,

(m) post-landing,

(n) for aeroplanes, operations on wet and contaminated runways.

3 Abnormal and/or emergency procedures

The abnormal and/or emergency procedures and duties assigned to the crew, the appropriate checklists, the system for their use and a statement covering the necessary coordination procedures between flight and cabin/other crew members. The abnormal and/or emergency procedures and duties should include the following:

(a) crew incapacitation,

(b) fire and smoke drills,

(c) for aeroplanes, un-pressurised and partially pressurised flight,

(d) for aeroplanes, exceeding structural limits such as overweight landing,

(e) lightning strikes,

(f) distress communications and alerting ATC to emergencies,

(g) engine/burner failure,

(h) system failures,

(i) guidance for diversion in case of serious technical failure,

(j) ground proximity warning, including for helicopters audio voice alerting device (AVAD) warning,

(k) ACAS/TCAS warning for aeroplanes/audio voice alerting device (AVAD) warning for helicopters,

(l) windshear,

(m) emergency landing/ditching,

(n) for aeroplanes, departure contingency procedures.

4 Performance

4.0 Performance data should be provided in a form that can be used without difficulty.

4.1 Performance data. Performance material that provides the necessary data for compliance with the performance requirements prescribed in Part- CAT. For aeroplanes, this performance data should be included to allow the determination of the following:

(a) take-off climb limits — mass, altitude, temperature;

(b) take-off field length (for dry, wet and contaminated runway conditions);

(c) net flight path data for obstacle clearance calculation or, where applicable, take-off flight path;

(d) the gradient losses for banked climb-outs;

(e) en-route climb limits;

(f) approach climb limits;

(g) landing climb limits;

(h) landing field length (for dry, wet and contaminated runway conditions) including the effects of an in-flight failure of a system or device, if it affects the landing distance;

(i) brake energy limits;

(j) speeds applicable for the various flight stages (also considering dry, wet and contaminated runway conditions).

4.1.1 Supplementary data covering flights in icing conditions. Any certified performance related to an allowable configuration, or configuration deviation, such as anti-skid inoperative.

4.1.2 If performance data, as required for the appropriate performance class, are not available in the AFM, then other data should be included. The OM may contain cross-reference to the data contained in the AFM where such data are not likely to be used often or in an emergency.

4.2 Additional performance data for aeroplanes. Additional performance data, where applicable, including the following:

(a) all engine climb gradients,

(b) drift-down data,

(c) effect of de-icing/anti-icing fluids,

(d) flight with landing gear down,

(e) for aircraft with 3 or more engines, one-engine-inoperative ferry flights,

(f) flights conducted under the provisions of the configuration deviation list (CDL).

5 Flight planning

5.1 Data and instructions necessary for pre-flight and in-flight planning including, for aeroplanes, factors such as speed schedules and power settings. Where applicable, procedures for engine(s)-out operations, ETOPS (particularly the one-engine-inoperative cruise speed and maximum distance to an adequate aerodrome determined in accordance with Part-CAT and flights to isolated aerodromes should be included.

5.2 The method for calculating fuel needed for the various stages of flight.

5.3 When applicable, for aeroplanes, performance data for ETOPS critical fuel reserve and area of operation, including sufficient data to support the critical fuel reserve and area of operation calculation based on approved aircraft performance data. The following data should be included:

(a) detailed engine(s)-inoperative performance data, including fuel flow for standard and non-standard atmospheric conditions and as a function of airspeed and power setting, where appropriate, covering:

(i) drift down (includes net performance), where applicable;

(ii) cruise altitude coverage including 10 000 ft;

(iii) holding;

(iv) altitude capability (includes net performance); and

(v) missed approach;

(b) detailed all-engine-operating performance data, including nominal fuel flow data, for standard and non-standard atmospheric conditions and as a function of airspeed and power setting, where appropriate, covering:

(i) cruise (altitude coverage including 10 000 ft); and

(ii) holding;

(c) details of any other conditions relevant to ETOPS operations which can cause significant deterioration of performance, such as ice accumulation on the unprotected surfaces of the aircraft, ram air turbine (RAT) deployment, thrust-reverser deployment, etc.; and

(d) the altitudes, airspeeds, thrust settings, and fuel flow used in establishing the ETOPS area of operations for each airframe-engine combination should be used in showing the corresponding terrain and obstruction clearances in accordance with Part-CAT.

6 Mass and balance

Instructions and data for the calculation of the mass and balance, including the following:

(a) calculation system (e.g. index system);

(b) information and instructions for completion of mass and balance documentation, including manual and computer generated types;

(c) limiting masses and centre of gravity for the types, variants or individual aircraft used by the operator;

(d) dry operating mass and corresponding centre of gravity or index.

7 Loading

Procedures and provisions for loading and unloading and securing the load in the aircraft.

8 Configuration deviation list

The CDL(s), if provided by the manufacturer, taking account of the aircraft types and variants operated, including procedures to be followed when an aircraft is being dispatched under the terms of its CDL.

9 Minimum Equipment List (MEL)

The MEL for each aircraft type or variant operated and the type(s)/area(s) of operation. The MEL should also include the dispatch conditions associated with operations required for a specific approval (e.g. RNAV, RNP, RVSM, ETOPS). Consideration should be given to using the ATA number system when allocating chapters and numbers.

10 Survival and emergency equipment including oxygen

10.1 A list of the survival equipment to be carried for the routes to be flown and the procedures for checking the serviceability of this equipment prior to take-off. Instructions regarding the location, accessibility and use of survival and emergency equipment and its associated checklist(s) should also be included.

10.2 The procedure for determining the amount of oxygen required and the quantity that is available. The flight profile, number of occupants and possible cabin decompression should be considered.

11 Emergency evacuation procedures

11.1 Instructions for preparation for emergency evacuation, including crew coordination and emergency station assignment.

11.2 Emergency evacuation procedures. A description of the duties of all members of the crew for the rapid evacuation of an aircraft and the handling of the passengers in the event of a forced landing, ditching or other emergency.

12 Aircraft Systems

A description of the aircraft systems, related controls and indications and operating instructions. Consideration should be given to use the ATA number system when allocating chapters and numbers.

C Route/role/area and aerodrome/operating site instructions and information

1 Instructions and information relating to communications, navigation and aerodromes/operating sites, including minimum flight levels and altitudes for each route to be flown and operating minima for each aerodrome/operating site planned to be used, including the following:

(a) minimum flight level/altitude;

(b) operating minima for departure, destination and alternate aerodromes;

(c) communication facilities and navigation aids;

(d) runway/final approach and take-off area (FATO) data and aerodrome/operating site facilities;

(e) approach, missed approach and departure procedures including noise abatement procedures;

(f) communication-failure procedures;

(g) search and rescue facilities in the area over which the aircraft is to be flown;

(h) a description of the aeronautical charts that should be carried on board in relation to the type of flight and the route to be flown, including the method to check their validity;

(i) availability of aeronautical information and MET services;

(j) en-route communication/navigation procedures;

(k) aerodrome/operating site categorisation for flight crew competence qualification;

(l) special aerodrome/operating site limitations (performance limitations and operating procedures, etc.).

2 Information related to landing sites available for operations approved in accordance with Subpart L (SET-IMC) of Annex V (Part-SPA) including:

(a) a description of the landing site (position, surface, slope, elevation, etc.);

(b) the preferred landing direction; and

(c) obstacles in the area.

D Training

1 Description of scope: Training syllabi and checking programmes for all operations personnel assigned to operational duties in connection with the preparation and/or conduct of a flight.

2 Content: Training syllabi and checking programmes should include the following:

2.1 for flight crew, all relevant items prescribed in Part-CAT, Part-SPA and ORO.FC;

2.2 for cabin crew, all relevant items prescribed in Part-CAT, Part-CC and ORO.CC;

2.3 for technical crew, all relevant items prescribed in Part-CAT, Part-SPA and ORO.TC;

2.4 for operations personnel concerned, including crew members:

(a) all relevant items prescribed in SPA.DG Subpart G of SPA.DG; and

(b) all relevant items prescribed in Part-CAT and ORO.SEC; and

2.5 for operations personnel other than crew members (e.g. dispatcher, handling personnel, etc.), all other relevant items prescribed in Part-CAT and in this Part pertaining to their duties.

3 Procedures:

3.1 Procedures for training and checking.

3.2 Procedures to be applied in the event that personnel do not achieve or maintain the required standards.

3.3 Procedures to ensure that abnormal or emergency situations requiring the application of part or all of the abnormal or emergency procedures, and simulation of instrument meteorological conditions (IMC) by artificial means are not simulated during CAT operations.

4 Description of documentation to be stored and storage periods

(b) If there are sections that, because of the nature of the operation, do not apply, it is recommended that operators maintain the numbering system described in ORO.MLR.101 and above and insert 'Not applicable' or 'Intentionally blank' where appropriate.

AMC4 ORO.MLR.100 Operations manual — general

CONTENTS – NON-COMMERCIAL SPECIALISED OPERATIONS WITH COMPLEX MOTOR- POWERED AIRCRAFT AND COMMERCIAL SPECIALISED OPERATIONS

(a) The OM should contain at least the following information, where applicable, as relevant to the area and type of operation:

A General/Basic

For chapters 0-7 refer to AMC3 ORO.MLR.100. In addition:

6.2 The relevant regulations and guidance to crew members concerning dangerous goods used for specialised tasks (pesticides and chemicals, etc.).

8 Operating Procedures

8.1 Flight preparation instructions. As applicable to the operation:

8.1.1 General procedures;

8.1.2 Minimum flight altitudes. A description of the method of determination and application of minimum altitudes, including a procedure to establish the minimum altitudes/flight levels;

8.1.3 Criteria and responsibilities for determining the adequacy of aerodromes/operating sites to be used;

8.1.4 Interpretation of meteorological information. Explanatory material on the decoding of MET forecasts and MET reports relevant to the area of operations, including the interpretation of conditional expressions;

8.1.5 Determination of the quantities of fuel, oil and water methanol carried. The methods by which the quantities of fuel, oil and water methanol to be carried are determined and monitored in-flight. The system for maintaining fuel and oil records should also be described;

8.1.6 Procedure for the determination of the mass of loads, the calculation of performance margins and the centre of gravity;

8.1.7 Emergency procedures, e.g. load, fuel or chemical jettison (to include the actions of all personnel);

8.1.8 System for supply of NOTAMS, meteorological and other safety-critical information both at base and in field locations;

8.1.9 Mandatory equipment for specific tasks (mirror, cargo sling, load cell, special radio equipment, radar altimeters, etc.);

8.1.10 Guidance on the CDL and MEL;

8.1.11 Policy on completion and carriage of documents including operator's aircraft technical log and journey log, or equivalent;

8.1.12 Any task-specific standard operating procedures not covered above.

8.2 Ground handling instructions. As applicable to the operation:

8.2.1 Briefing requirements for in-flight and ground task specialists;

8.2.2 Decontamination procedures;

8.2.3 Fuelling procedures, including safety precautions during refuelling and defuelling including quality checks required in the field location, precautions against spillage and environmental damage;

8.2.4 De-icing and anti-icing on the ground. A description of the de-icing and anti-icing policy and procedures for aircraft on the ground.

8.3 Flight procedures. As applicable to the operation:

8.3.1 Procedures relevant to the aircraft type, specific task and area;

8.3.2 Altimeter setting procedures;

8.3.3 Actions following alerts from audio warning devices;

8.3.4 GPWS/TAWS for aeroplanes. Procedures and instructions required for the avoidance of controlled flight into terrain, including limitations on high rate of descent near the surface (the related training requirements are covered in OM-D 2.1);

8.3.5 Policy and procedures for the use of TCAS/ACAS for aeroplanes and, when applicable, for helicopters;

8.3.6 Policy and procedures for in-flight fuel management;

8.3.7 Procedures for operating in adverse and potentially hazardous atmospheric conditions;

8.3.8 Wake turbulence and rotor downwash for helicopters;

8.3.9 Use of restraint devices;

8.3.10 Policy on use of vacant seats;

8.3.11 Cabin safety requirements including smoking.

8.4 Task-specific weather limitations.

8.5 Use of the minimum equipment and configuration deviation list(s).

8.6 Oxygen requirements. An explanation of the conditions under which oxygen should be provided and used (altitude, exposure times, night etc.).

9 Dangerous goods and weapons

9.1 Information, instruction and general guidance on the transport of dangerous goods as internal or external loads, including:

9.1.1 The operator's policy on the transport of dangerous goods;

9.1.2 Guidance on the requirements for acceptance, labelling, handling, stowage, and segregation of dangerous goods;

9.1.3 Procedures for responding to emergency situations involving dangerous goods;

9.1.4 Duties of all personnel involved; and

9.1.5 Instructions on carriage of the operator’s personnel on cargo aircraft when dangerous goods are being carried.

9.2 The conditions under which weapons, munitions of war and sporting weapons may be carried.

10 Security

Security instructions, guidance, procedures, training and responsibilities. Some parts of the security instructions and guidance may be kept confidential.

11 Handling, notifying and reporting accidents, incidents and occurrences and using the CVR recordings

Procedures for the handling, notifying and reporting of accidents and occurrences. This section should include:

11.1 Definitions of accidents and occurrences and responsibilities of all persons involved;

11.2 Reporting procedures (including any mandatory forms); and

11.3 Special notification when dangerous goods are carried.

11.4 Procedures for the preservation of recordings of the flight recorders in order to prevent inadvertent reactivation, repair or reinstallation of the flight recorders following an accident or a serious incident or when this preservation is directed by the investigating authority.

12 Rules of the air

In addition to the items referred to in AMC3 ORO.MLR.100, territorial procedures for obtaining permissions and exemptions, e.g. for underslung loads and low flying clearances.

13 Leasing

Refer to AMC3 ORO.MLR.100.

B Aircraft operating matters — type related

For chapters 0-1 refer to AMC3 ORO.MLR.100.

2 Normal procedures

The normal procedures and duties assigned to the crew, the appropriate checklists and the system for their use, including any task or specific role equipment procedures not contained in the AFM.

3 Abnormal and/or emergency procedures

The abnormal and/or emergency procedures and duties assigned to the crew, the appropriate checklists and the system for their use, including any task or specific role equipment emergency procedures not contained in the AFM.

4 Performance

4.1 Performance data should be provided in a form in which it can be used without difficulty.

4.2 Performance data. Performance material which provides the necessary data for compliance with the performance requirements prescribed in Part-SPO.

5 Flight Planning

5.1 Data and instructions necessary for pre-flight and in-flight planning.

5.2 Procedures for specialised tasks.

6 Mass and Balance

Instructions and data for the calculation of the mass and balance, including:

6.1 Calculation system (e.g. index system);

6.2 Information and instructions for completion of mass and balance documentation; and

6.3 Limitations.

7 Loading

Refer to AMC3 ORO.MLR.100.

8 Configuration Deviation List (CDL)

Refer to AMC3 ORO.MLR.100.

9 Minimum Equipment List (MEL)

The MEL for each aircraft type or variant operated and the type(s)/area(s) of operation. It should also contain procedures to be followed when an aircraft is being dispatched with one or more inoperative items, in accordance with the MEL.

10 Survival and emergency equipment including oxygen

10.1 A list of the survival equipment to be carried, taking into account the nature of the area of operation, such as a hostile or a non-hostile environment.

10.2 A checklist for assessing the serviceability of the equipment and instructions for its use prior to take-off.

10.3 The procedure for determining the amount of oxygen required and the quantity that is available.

11 Emergency evacuation procedures

11.1 Emergency evacuation procedures, crew coordination and occupant handling in the event of a forced landing, ditching or other emergency.

12 Aircraft systems

A description of the aircraft systems and all equipment specific to the tasks. Additional equipment, systems or fitting, related special procedures including any supplements to the AFM.

C Tasks and operating areas instructions and information

Specific instructions related to the specialised tasks and operating areas in accordance with AMC3 ORO.MLR.100.

D Training

1 Training syllabi and checking programmes for all operations personnel assigned to operational duties in connection with the preparation and/or conduct of a flight.

2 Training syllabi and checking programmes should include:

2.1 For flight crew, all relevant items prescribed in Part-SPO, Part-SPA and this Part;

2.2 For other crew members, all relevant items prescribed in Part-SPO and this Part, as applicable;

2.3 For in-flight and ground task specialists concerned, including crew members:

(a) All relevant items prescribed in SPA.DG; and

(b) All relevant items prescribed in Part-SPO and ORO.SEC; and

2.4 For operations personnel other than crew members, all other relevant items pertaining to their duties prescribed in Part-SPO and this Part.

3 Procedures:

3.1 Procedures for training and checking.

3.2 Procedures to be applied in the event that personnel do not achieve or maintain the required standards.

3.3 A system for tracking expiry dates for qualifications, checks, tests, recency and licences.

4 Description of documentation to be stored and storage periods

(b) If there are sections that, because of the nature of the operation, do not apply, it is recommended that operators maintain the numbering system described in ORO.MLR.101 and above and insert ‘Not applicable’ or ‘Intentionally blank’ where appropriate.

AMC5 ORO.MLR.100 Operations manual — general

CROSSWIND LIMITATIONS IN THE OPERATIONS MANUAL (OM)

When publishing operational crosswind limitations in Part B of the OM in accordance with AMC3 ORO.MLR.100, operators should consider:

(a) the following manufacturer's information:

(1) values published in the 'Limitations' Section of the AFM;

(2) maximum demonstrated crosswind values, when more limiting values are not published in the 'Limitations' Section of the AFM;

(3) gust values; and

(4) additional guidance or recommendations;

(b) operational experience; and

(c) operating-environment factors such as:

(1) runway width;

(2) runway surface condition; and

(3) prevailing weather conditions

GM1 ORO.MLR.100(k) Operations manual — general

HUMAN FACTORS PRINCIPLES

Guidance material on the application of human factors principles can be found in the ICAO Human Factors Training Manual (Doc 9683).

GM1 ORO.MLR.105(a) Minimum equipment list

GENERAL

(a) The Minimum Equipment List (MEL) is a document that lists the equipment that may be temporarily inoperative, subject to certain conditions, at the commencement of flight. This document is prepared by the operator for their own particular aircraft taking account of their aircraft configuration and all those individual variables that cannot be addressed at MMEL level, such as operating environment, route structure, geographic location, aerodromes where spare parts and maintenance capabilities are available, etc., in accordance with a procedure approved by the Brunei DCA.

(b) The MMEL, as defined in the mandatory part of the operational suitability data established in accordance with Part 21, is developed in compliance with CS-MMEL or CS-GEN-MMEL. These certification specifications contain, among other, guidance intended to standardise the level of relief granted in MMELs, in particular for items that are subject to operational requirements. If a MMEL established as part of the operational suitability data established in accordance with Part 21 is not available and items subject to operational requirements are listed in the available MMEL without specific relief or dispatch conditions but only with a reference to the operational requirements, the operator may refer to CS-MMEL or CS-GEN-MMEL guidance material, as applicable, to develop the relevant MEL content for such items.

NON-SAFETY RELATED EQUIPMENT

(a) Most aircraft are designed and certified with a significant amount of equipment redundancy, such that the airworthiness requirements are satisfied by a substantial margin. In addition, aircraft are generally fitted with equipment that is not required for safe operation under all operating conditions, e.g. instrument lighting in day VMC.

(b) All items related to the airworthiness, or required for the safe operation, of the aircraft and not included in the list are automatically required to be operative.

(c) Equipment, such as entertainment systems or galley equipment, may be installed for passenger convenience. If this non-safety-related equipment does not affect the airworthiness or operation of the aircraft when inoperative, it does not require a rectification interval, and need not be listed in the operator's MEL, if it is not addressed in the MMEL. The exceptions to this are as follows:

(1) Where non-safety-related equipment serves a second function, such as movie equipment being used for cabin safety briefings, operators should develop and include operational contingency procedures in the MEL in case of an equipment malfunction.

(2) Where non-safety-related equipment is part of another aircraft system, for example the electrical system, procedures should be developed and included in the MEL for deactivating and securing in case of malfunction. In these cases, the item should be listed in the MEL, with compensating provisions and deactivation instructions if applicable. The rectification interval will be dependent on the secondary function of the item and the extent of its effect on other systems.

(a) If the operator chooses to list non-safety-related equipment in the MEL, not listed in the MMEL, they should include a rectification interval category. These items may be given a 'D' category rectification interval provided any applicable (M) procedure (in the case of electrically supplied items) is applied.

(b) Operators should establish an effective decision making process for failures that are not listed to determine if they are related to airworthiness and required for safe operation. In order for inoperative installed equipment to be considered non-safety- related, the following criteria should be considered:

(1) the operation of the aircraft is not adversely affected such that standard operating procedures related to ground personnel, and crew members are impeded;

(2) the condition of the aircraft is not adversely affected such that the safety of passengers and/or personnel is jeopardised;

(3) the condition of the aircraft is configured to minimise the probability of a subsequent failure that may cause injury to passengers/personnel and/or cause damage to the aircraft;

(4) the condition does not include the use of required emergency equipment and does not impact emergency procedures such that personnel could not perform them.

AMC1 ORO.MLR.105(c) Minimum equipment list

AMENDMENTS TO THE MEL FOLLOWING CHANGES TO THE MMEL — APPLICABLE CHANGES AND ACCEPTABLE TIMESCALES

(a) The following are applicable changes to the MMEL that require amendment of the MEL:

(1) a reduction of the rectification interval;

(2) change of an item, only when the change is applicable to the aircraft or type of operations and is more restrictive.

(i) An acceptable timescale for submitting the amended MEL to the Brunei DCA is 90 days from the effective date specified in the approved change to the MMEL.

(ii) Reduced timescales for the implementation of safety-related amendments may be required if the Brunei DCA consider it necessary.

AMC1 ORO.MLR.105(d) Minimum equipment list

MEL FORMAT

(a) The MEL format and the presentation of items and dispatch conditions should reflect those of the MMEL.

(b) The ATA 100/2200 Specification numbering system for MEL items is preferred.

(c) Other formats and item numbering systems may be used provided they are clear and unambiguous.

AMC1 ORO.MLR.105(d)(1) Minimum equipment list

MEL PREAMBLE

The MEL preamble should:

(a) reflect the content of the MMEL preamble as applicable to the MEL scope and extent;

(b) contain terms and definitions used in the MEL;

(c) contain any other relevant specific information for the MEL scope and use that is not originally provided in the MMEL;

(d) provide guidance on how to identify the origin of a failure or malfunction to the extent necessary for appropriate application of the MEL;

(e) contain guidance on the management of multiple unserviceabilities, based on the guidance given in the MMEL; and

(f) contain guidance on placarding of inoperative items to inform crew members of equipment condition, as appropriate. In particular, when such items are accessible to the crew during flight, the control(s) and indicator(s) related to inoperative unit(s) should be clearly placarded.

AMC1 ORO.MLR.105(d)(3) Minimum equipment list

SCOPE OF THE MEL

The MEL should include:

(a) The dispatch conditions associated with flights conducted in accordance with specific approvals held by the operator in accordance with Part-SPA.

(b) Specific provision for particular types of operations carried out by the operator in accordance with ORO.GEN.310 and with and ORO.AOC.125.

AMC2 ORO.MLR.105(d)(3) Minimum equipment list

EXTENT OF THE MEL

The operator should include guidance in the MEL on how to deal with any failures that occur between the commencement of the flight and the start of the take-off. If a failure occurs between the commencement of the flight and the start of the take-off, any decision to continue the flight should be subject to pilot judgement and good airmanship. The pilot-in-command/commander may refer to the MEL before any decision to continue the flight is taken.

GM1 ORO.MLR.105(d)(3) Minimum equipment list

SCOPE OF THE MEL

(a) Examples of special approvals in accordance with Part-SPA may be:

(1) RVSM,

(2) ETOPS,

(3) LVO.

(b) Different types of operations carried out by the operator in accordance with ORO.GEN.310 and with ORO.AOC.125 may be:

(1) crew training,

(2) positioning flights,

(3) demonstration flights.

(c) When an aircraft has installed equipment which is not required for the operations conducted, the operator may wish to delay rectification of such items for an indefinite period. Such cases are considered to be out of the scope of the MEL, therefore modification of the aircraft is appropriate and deactivation, inhibition or removal of the item should be accomplished by an appropriate approved modification procedure.

GM2 ORO.MLR.105(d)(3) Minimum equipment list

PURPOSE OF THE MEL

The MEL is an alleviating document having the purpose to identify the minimum equipment and conditions to operate safely an aircraft having inoperative equipment. Its purpose is not, however, to encourage the operation of aircraft with inoperative equipment. It is undesirable for aircraft to be dispatched with inoperative equipment and such operations are permitted only as a result of careful analysis of each item to ensure that the acceptable level of safety, as intended in the applicable airworthiness and operational requirements is maintained. The continued operation of an aircraft in this condition should be minimised.

GM1 ORO.MLR.105(e);(f) Minimum equipment list

RECTIFICATION INTERVAL (RI)

The definitions and categories of rectification intervals are provided in CS-MMEL.

AMC1 ORO.MLR.105(f) Minimum equipment list

RECTIFICATION INTERVAL EXTENSION (RIE) — OPERATOR PROCEDURES FOR THE APPROVAL BY THE Brunei DCA AND NOTIFICATION TO THE Brunei DCA.

(a) The operator's procedures to address the extension of rectification intervals and ongoing surveillance to ensure compliance should provide the Brunei DCA with details of the name and position of the nominated personnel responsible for the control of the operator's rectification interval extension (RIE) procedures and details of the specific duties and responsibilities established to control the use of RIEs.

(b) Personnel authorising RIEs should be adequately trained in technical and/or operational disciplines to accomplish their duties. They should have necessary operational knowledge in terms of operational use of the MEL as alleviating documents by flight crew and maintenance personnel and engineering competence. The authorising personnel should be listed by appointment and name.

(c) The operator should notify the Brunei DCA within 1 month of the extension of the applicable rectification interval or within the appropriated timescales specified by the approved procedure for the RIE.

(d) The notification should be made in a form determined by the Brunei DCA and should specify the original defect, all such uses, the reason for the RIE and the reasons why rectification was not carried out within the original rectification interval.

GM1 ORO. MLR.105(f) Minimum equipment list

RECTIFICATION INTERVAL EXTENSION (RIE)

Procedures for the extension of rectification intervals should only be applied under certain conditions, such as a shortage of parts from manufacturers or other unforeseen situations (e.g. inability to obtain equipment necessary for proper troubleshooting and repair), in which case the operator may be unable to comply with the specified rectification intervals.

AMC1 ORO.MLR.105(g) Minimum equipment list

OPERATIONAL AND MAINTENANCE PROCEDURES

(a) The operational and maintenance procedures referenced in the MEL should be based on the operational and maintenance procedures referenced in the MMEL. Modified procedures may, however, be developed by the operator when they provide the same level of safety, as required by the MMEL. Modified maintenance procedures should be developed in accordance with the continuing airworthiness regulations.

(b) Providing appropriate operational and maintenance procedures referenced in the MEL, regardless of who developed them, is the responsibility of the operator.

(c) Any item in the MEL requiring an operational or maintenance procedure to ensure an acceptable level of safety should be so identified in the 'remarks' or 'exceptions' column/part/section of the MEL. This will normally be '(O)' for an operational procedure, or '(M)' for a maintenance procedure. '(O)(M)' means both operational and maintenance procedures are required.

(d) The satisfactory accomplishment of all procedures, regardless of who performs them, is the responsibility of the operator.

GM1 ORO.MLR.105(g) Minimum equipment list

OPERATIONAL AND MAINTENANCE PROCEDURES

(a) Operational and maintenance procedures are an integral part of the compensating conditions needed to maintain an acceptable level of safety, enabling the Brunei DCA to approve the MEL. The Brunei DCA may request presentation of fully developed (O) and/or (M) procedures in the course of the MEL approval process.

(b) Normally, operational procedures are accomplished by the flight crew; however, other personnel may be qualified and authorised to perform certain functions.

(c) Normally, maintenance procedures are accomplished by the maintenance personnel; however, other personnel may be qualified and authorised to perform certain functions in accordance with the continuing airworthiness regulations.

(d) Operator's manuals may include the OM, the continued airworthiness management organisation manual (CAME) or other documents. Operational and maintenance procedures, regardless of the document where they are contained, should be readily available for use when needed for the application of the MEL.

(e) Unless specifically permitted by a maintenance procedure, an inoperative item may not be removed from the aircraft.

AMC1 ORO.MLR.105(h) Minimum equipment list

OPERATIONAL AND MAINTENANCE PROCEDURES — APPLICABLE CHANGES

(a) Changes to the operational and maintenance procedures referenced in the MMEL are considered applicable and require the amendment of the maintenance and operating procedures referenced in the MEL when:

(1) the modified procedure is applicable to the operator's MEL; and

(2) the purpose of this change is to improve compliance with the intent of the associated MMEL dispatch condition.

(b) An acceptable timescale for the amendments of maintenance and operating procedures, as defined in (a), should be 90 days from the date when the amended procedures referenced in the MMEL are made available. Reduced timescales for the implementation of safety related amendments may be required if the Brunei DCA considers it necessary.

AMC1 ORO.MLR.105(j) Minimum equipment list

OPERATION OF AN AIRCRAFT WITHIN THE CONSTRAINTS OF THE MMEL — OPERATOR'S PROCEDURES FOR THE APPROVAL BY THE Brunei DCA

(a) The operator's procedures to address the operation of an aircraft outside the constraints of the MEL but within the constraints of the MMEL and ongoing surveillance to ensure compliance should provide the Brunei DCA with details of the name and position of the nominated personnel responsible for the control of the operations under such conditions and details of the specific duties and responsibilities established to control the use of the approval.

(b) Personnel authorising operations under such approval should be adequately trained in technical and operational disciplines to accomplish their duties. They should have the necessary operational knowledge in terms of operational use of the MEL as alleviating documents by flight crew and maintenance personnel and engineering competence. The authorising personnel should be listed by appointment and name.

GM1 ORO.MLR.105(j) Minimum equipment list

OPERATION OF AN AIRCRAFT WITHIN THE CONSTRAINTS OF THE MMEL — OPERATOR'S PROCEDURES FOR THE APPROVAL BY THE Brunei DCA

Procedures for the operation of an aircraft outside the constraints of the MEL but within the constraints of the MMEL should only be applied under certain conditions, such as a shortage of parts from manufacturers or other unforeseen situations (e.g. inability to obtain equipment necessary for proper troubleshooting and repair), in which case the operator may be unable to comply with the constraints specified in the MEL.

GM1 ORO.MLR.100(k) Operations manual — general

HUMAN FACTORS PRINCIPLES

Guidance material on the application of human factors principles can be found in the ICAO Human Factors Training Manual (Doc 9683).

AMC1 ORO.MLR.110 Journey log

GENERAL

(a) The aircraft journey log, or equivalent, should include the following items, where applicable:

(1) aircraft nationality and registration,

(2) date,

(3) name(s) of crew member(s),

(4) duty assignments of crew member(s),

(5) place of departure,

(6) place of arrival,

(7) time of departure,

(8) time of arrival,

(9) hours of flight,

(10) nature of flight (scheduled or non-scheduled),

(11) incidents, observations, if any,

(12) signature of person in charge.

(b) The information, or parts thereof, may be recorded in a form other than on printed paper. Accessibility, usability and reliability should be assured.

(c) 'Journey log, or equivalent' means that the required information may be recorded in documentation other than a log book, such as the operational flight plan or the aircraft technical log.

(d) 'Series of flights' means consecutive flights, which begin and end:

(1) within a 24-hour period;

(2) at the same aerodrome or operating site or remain within a local area specified in the operations manual; and

(3) with the same pilot-in-command/commander of the aircraft.

GM1 ORO.MLR.110 Journey log

SERIES OF FLIGHTS

The term 'series of flights' is used to facilitate a single set of documentation.

AMC1 ORO.MLR.115 Record-keeping

TRAINING RECORDS

A summary of training should be maintained by the operator to show every crew member's completion of each stage of training and checking.

GM1 ORO.MLR.115(c) Record-keeping

PERSONNEL RECORDS

'Personnel records' in ORO.MLR.115(c) means detailed crew member training, checking and qualification records. These records include detailed examination records.

GM1 ORO.MLR.115(d) Record-keeping

TRAINING, CHECKING AND QUALIFICATION RECORDS

Training, checking and qualification records include records of all training, checking and qualifications of each crew member, as prescribed in Part-ORO.

Subpart SEC - Security

Subpart FC - Flight Crew

Section 1 - Common requirements

GM1 ORO.FC.100(c) Composition of flight crew

LICENCE AND RATINGS IN ACCORDANCE WITH BAR 1 PART FCL

When determining the composition of the crew, and monitoring whether the flight crew holds the appropriate licence and ratings, the operator needs to take into account any limitations prescribed in Regulation (EU) No 1178/2011 applicable to the flight crew members such as, but not limited to, recent experience and operational multi-pilot limitation.

AMC1 ORO.FC.105(b)(2);(c) Designation as pilot-in-command/commander

GENERAL

The operator should comply with the national training and checking requirements published in the aeronautical information publication (AIP).

ROUTE, AREA AND AERODROME KNOWLEDGE FOR COMMERCIAL OPERATIONS

The experience of the route or area to be flown and of the aerodrome facilities and procedures to be used should include the following:

(a) Area and route knowledge

(1) An objective of the area and route training should be to ensure that the pilot has knowledge of:

(i) terrain and minimum safe altitudes;

(ii) seasonal meteorological conditions;

(iii) meteorological, communication and air traffic facilities, services and procedures;

(iv) search and rescue procedures where available; and

(v) navigational facilities associated with the area or route along which the flight is to take place.

(2) Another objective of the area and route training should be to ensure that the pilots are aware of the most significant underlying risks and threats of a route or an area that could affect their operations following the 'threat and error management model' or an alternative risk model agreed with the authority.

(3) The area and route familiarisation training should:

(i) be based on an assessment by the operator of the underlying risks and threats of a route or an area using:

(A) internal evidence;

(B) external evidence;

(ii) be conducted:

(A) as an initial training before operating to a route and area;

(B) as a refresher training after not operating to a route and area for 12 months.

(4) The area and route familiarisation training should be delivered using different methods and tools.

(i) The selection of the method and tools should result from a combination of the learning objectives and the type of risk or threat that 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 and awareness.

(iii) The methods and tools employed should include one or more of the following: Training in a flight simulation training device (FSTD), computer-based training, familiarisation flight as a pilot in-command/commander or co-pilot under supervision or an observer, video training, virtual reality training, familiarisation by self-briefing with route documentation and audio training.

(b) Aerodrome knowledge

(1) Aerodrome familiarisation training should include knowledge of obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, applicable operating minima and ground movement considerations.

(2) The operations manual should describe the method of categorisation of aerodromes and, in the case of CAT operations, provide a list of those aerodromes categorised as B or C.

(3) All aerodromes to which an operator operates should be categorised in one of these three categories:

(i) category A — an aerodrome that meets all of the following conditions:

(A) a straight-in 3D instrument approach procedure with a glide path angle of not more than 3.5 degrees to each runway expected to be used for landing;

(B) at least one runway with no performance-limited procedure for take-off and/or landing, such as no requirement to follow a contingency procedure for obstacle clearance in the event of an engine failure on take-off from any runway expected to be used for departure; and

(C) night operations capability.

(ii) category B — an aerodrome that does not meet the category A conditions or which requires extra considerations due to:

(A) non-standard approach aids and/or approach patterns, such as restrictions on the availability of straight-in instrument approach procedures;

(B) unusual local weather conditions, such as environmental features that can give rise to turbulence, windshear or unusual wind conditions;

(C) unusual characteristics or performance limitations, such as unusual runway characteristics in length, width, slope, markings or lighting that present an atypical visual perspective on approach;

(D) any other relevant considerations, including obstructions, physical layout, lighting, etc, such as restrictions on circling in certain sectors due to obstacles in the circling area;

(E) training or flight crew experience requirements stipulated by the competent authority responsible for the aerodrome that do not include instruction in an FSTD or visiting the aerodrome.

(iii) category C — an aerodrome that requires additional considerations to a category B aerodrome;

Offshore installations may be categorised as category B or C aerodromes, taking into account the limitations determined in accordance with AMC1 SPA.HOFO.115 Use of offshore locations.

(c) Prior to operating to a category B aerodrome (planned destination or required alternate), the pilot-in-commander should:

(1) comply with any requirements stipulated by the competent authority responsible for the aerodrome; and

(2) be briefed, or self-brief by means of programmed instruction, about the additional considerations applicable to operations to that category B aerodrome. The completion of the briefing should be recorded. This recording may be accomplished after completion or confirmed by the pilot-in-command/commander before departure on a flight involving category B aerodrome(s) as destination or alternate aerodromes.

(d) Prior to operating a category C aerodrome (planned destination or required alternate), the pilot-in-command/commander should:

(1) comply with any requirements stipulated by the competent authority responsible for the aerodrome; and

(2) be briefed or self-brief by means of programmed instruction, about the additional considerations applicable to operations to that category C aerodrome; and

(3) visit the aerodrome as an observer and/or undertake instruction in a suitable FSTD. The observer should occupy an observer's seat where installed. If an observer's seat is not available and cannot be installed, the pilot-in-command/commander may occupy a pilot seat to conduct the aerodrome visit with a suitably qualified commander nominated by the category C aerodrome operator.

The completion of the briefing, visit and/or instruction should be recorded.

AMC2 ORO.FC.105(b)(2);(c) Designation as pilot-in-command/commander

GENERAL

The operator should comply with the national training and checking requirements published in the AIP.

ROUTE, AREA AND AERODROME KNOWLEDGE FOR NON-COMMERCIAL OPERATIONS

The knowledge of the route and area to be flown and of the aerodrome facilities and procedures to be used should include the following:

(a) Area and route knowledge

(1) The objective of the area and route familiarisation should be to ensure that the pilot has knowledge of:

(i) terrain and minimum safe altitudes;

(ii) seasonal meteorological conditions;

(iii) meteorological, communication and air traffic facilities, services and procedures;

(iv) search and rescue procedures where available; and

(v) navigational facilities associated with the area or route along which the flight is to take place.

(2) The operations manual should describe appropriate methods of familiarisation depending on the complexity of the area or route and the experience of the pilot-in-command.

(b) Aerodrome knowledge

(1) Aerodrome familiarisation should include knowledge of obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, applicable operating minima and ground movement considerations.

(2) The operator's manual should describe appropriate methods of familiarisation depending on the complexity of the aerodrome.

(3) If the competent authority of the aerodrome or area requires specific training or familiarisation, the operator should maintain all records of this training or familiarisation in accordance with ORO.GEN.220.

(4) For offshore installations, the limitations determined in accordance with AMC1 SPA.HOFO.115 should be taken into account.

GM1 ORO.FC.105 (b)(2) Route and aerodrome knowledge

ENVIRONMENTAL KNOWLEDGE RELATED TO THE PREVENTION OF AEROPLANE UPSETS

The knowledge should include understanding of:

(a) the relevant environmental hazards, such as:

— Clear Air Turbulence (CAT),

— Intertropical Convergence Zone (ITCZ),

— thunderstorms,

— microbursts,

— wind shear,

— icing,

— mountain waves,

— wake turbulence, and

— temperature changes at high altitude;

(b) the evaluation and management of the associated risks of the relevant hazards in (a); and

(c) the available mitigating procedures for the relevant hazards in (a) related to the specific route, route area, or aerodrome used by the operator.

GM2 ORO.FC.105(b)(2) Designation as pilot-in-command/commander

AERODROME KNOWLEDGE FOR NON-COMMERCIAL OPERATIONS

The operator may, based on complexity, categorise all aerodromes in one of the following three categories:

(a) category A — an aerodrome that meets all the following conditions:

(1) an approved instrument approach procedure;

(2) at least one runway with no performance-limited procedure for take-off and/or landing;

(3) published circling minima not higher than 1 000 ft above aerodrome level; and

(4) night operations capability.

(b) category B — an aerodrome that does not meet the category A conditions or which requires extra considerations due to:

(1) non-standard approach aids and/or approach patterns;

(2) unusual local weather conditions;

(3) unusual characteristics or performance limitations;

(4) any other relevant considerations, including obstacles, physical layout, lighting, etc.

(c) category C — an aerodrome that requires additional considerations to those of a category B aerodrome.

Offshore installations may be categorised as category B or C aerodromes, taking into account the limitations determined in accordance with AMC1 SPA.HOFO.115 'Use of offshore locations'.

AMC1 ORO.FC.105(b)(3) Designation as pilot-in-command/commander

OPERATOR'S COMMAND COURSE FOR NON-COMMERCIAL OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT (NCC)

(a) For aeroplane and helicopter operations, when upgrading from co-pilot to pilot-in-command, the flight crew member should be trained at least on the following elements, as part of the command course:

(1) command responsibilities training;

(2) demonstration of competence operating as pilot-in-command.

(b) Demonstration of competence operating as pilot-in-command may be achieved by:

(1) completing a proficiency check in the role of pilot-in-command; or

(2) operating at least one flight under the supervision and to the satisfaction of a suitably qualified pilot-in-command nominated by the operator.

AMC1 ORO.FC.105(c) Designation as pilot-in-command/commander

ROUTE/AREA AND AERODROME RECENCY

(a) The 12-month period should be counted from the last day of the month:

(1) when the familiarisation training was undertaken; or

(2) of the latest operation on the route or area to be flown and of the aerodromes, facilities and procedures to be used.

(b) The 36-month period should be counted from the last day of the month:

(1) when the familiarisation training was undertaken; or

(2) when the latest operation on the route or area was flown.

AMC2 ORO.FC.105(c) Designation as pilot-in-command/commander

ROUTE/AREA AND AERODROME RECENCY — PERFORMANCE CLASS B AEROPLANES OPERATED UNDER VFR BY NIGHT OR IFR IN CAT OPERATIONS AND COMMERCIAL OPERATIONS OTHER THAN CAT

In the case of CAT operations with performance class B aeroplanes operating under visual flight rules (VFR) by night or instrument flight rules (IFR), or commercial operations other than CAT, the knowledge should be maintained as follows:

(a) except for operations to the most demanding aerodromes, by completion of at least 10 flight sectors within the area of operation during the preceding 12 months in addition to any required self-briefing;

(b) operations to the most demanding aerodromes may be performed only if:

(1) the pilot-in-command/commander has been qualified at the aerodrome within the preceding 36 months by a visit as an operating flight crew member or as an observer;

(2) the approach is performed in visual meteorological conditions (VMC) from the applicable minimum sector altitude; and

(3) an adequate self-briefing has been made prior to the flight.

GM1 ORO.FC.105(c) Designation as pilot-in-command/commander

AREA AND ROUTE FAMILIARISATION TRAINING DELIVERY

When developing the area and route familiarisation training, the operator may apply the following methodology:

(a) Internal evidence

(1) Operator assessment by conducting an operational risk evaluation according to the following criteria:

(i) terrain and minimum safe altitudes;

(ii) seasonal meteorological conditions;

(iii) meteorological, communication and air traffic facilities, services and procedures;

(iv) search and rescue procedures where available; and

(v) navigational facilities associated with the area or route along which the flight is to take place.

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

(b) External evidence

(1) notices to airmen (NOTAMs); (2) AIP.

(c) When selecting the method and tool, operators should be driven by the objective of reaching the optimum in terms of the desired outcome, which is the maximum possible knowledge increase. This methodology intends that such selection is based on the type of the underlying risks of a route / area as determined in accordance with (a) and (b) and the learning objectives. For example: for the less complex areas or routes, familiarisation by self-briefing with route documentation, or by means of programmed instruction; and for the more complex areas or routes, in-flight familiarisation as a pilot-in-command/commander or co-pilot under supervision or an observer, or familiarisation in a flight simulation training device (FSTD) using a database appropriate to the route concerned.

AMC1 ORO.FC.105(d) Designation as pilot-in-command/commander

AREA FAMILIARISATION TRAINING THAT INCLUDES ROUTE /AERODROME FAMILIARISATION — HELICOPTERS

(a) The area familiarisation training for day VFR should ensure that a pilot is capable of selecting aerodromes and operating sites from the ground and from the air, and of establishing a safe flight path for landing and take-off.

AREA FAMILIARISATION TRAINING

(b) The following areas and conditions should require specific area familiarisation training:

(1) mountain environment;

(2) offshore environment;

(3) complex airspace;

(4) areas that are regularly covered by snow and are prone to white-out phenomena during the cruise or landing phase; and

(5) other challenging areas or conditions.

GM1 ORO.FC.105(d) Designation as pilot-in-command/commander

PERFORMANCE CLASS B AEROPLANES OPERATED UNDER VFR BY DAY IN CAT OPERATIONS

For CAT operations under VFR by day with performance Class B aeroplanes, the operator should take account of any requirement that might be stipulated in specific cases by the State of the aerodrome.

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.

(4) Flight simulation training devices (FSTDs)

(i) Whenever practicable, parts of the CRM training should be conducted in FSTDs that reproduce a realistic operational environment and permit interaction. This includes but is not limited to line-oriented flight training (LOFT) scenarios.

(ii) If the operator proficiency check is conducted in a FSTD, it should include a line-oriented flight during which a complementary CRM assessment should take place, in conditions that reproduce a realistic operational environment.

(5) Integration into flight crew training

CRM principles should be integrated into relevant parts of flight crew training and operations including checklists, briefings, abnormal and emergency procedures.

(6) Combined CRM training for flight crew, cabin crew and technical crew

(i) Operators should provide combined training for flight crew, cabin crew and technical crew during recurrent CRM training.

(ii) The combined training should address at least:

(A) effective communication, coordination of tasks and functions of flight crew, cabin crew and technical crew; and

(B) mixed multinational and cross-cultural flight crew, cabin crew and technical crew, and their interaction, if applicable.

(iii) The combined training should be expanded to include medical passengers, if applicable to the operation.

(iv) Combined CRM training should be conducted by flight crew CRM trainer or cabin crew CRM trainer.

(v) There should be an effective liaison between flight crew, cabin crew and technical crew training departments. Provision should be made for transfer of relevant knowledge and skills between flight crew, cabin crew and technical crew CRM trainers.

(7) Management system

CRM training should address hazards and risks identified by the operator's management system described in ORO.GEN.200.

(8) Competency-based CRM training

(i) Whenever practicable, the compliance-based approach concerning CRM training may be substituted by a competency-based approach such as evidence-based training. In this context, CRM training should be characterised by a performance orientation, with emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

(ii) CRM training should be an essential element of the alternative training and qualification programme (ATQP) described in ORO.FC.A.245, when the operator applies ATQP.

(9) Contracted CRM training

If the operator chooses not to establish its own CRM training, another operator, a third party or a training organisation may be contracted to provide the training in accordance with ORO.GEN.205. In case of contracted CRM training, the operator should ensure that the content of the course covers the specific culture, the type of operations and the associated procedures of the operator. When crew members from different operators attend the same course, the CRM training should be specific to the relevant flight operations and to the trainees concerned.

(b) Initial operator's CRM training

(1) The flight crew member should complete the initial operator's CRM training once. When the type of operation of a new operator is not different, the new operator should not be required to provide the initial operator's CRM training to this flight crew member a second time.

(2) The initial training should cover all elements specified in Table 1 of (g).

(c) Operator conversion course — CRM training

When the flight crew member undertakes a conversion course with a change of aircraft type or when joining an operator, elements of CRM training should be integrated into all appropriate phases of the operator's conversion course, as specified in Table 1 of (g).

(d) Annual recurrent CRM training

(1) Annual recurrent CRM training should be provided in such a way that all CRM training elements specified for the annual recurrent training in Table 1 of (g) are covered over a period not exceeding 3 years.

(2) Operators should update their CRM recurrent training programme over a period not exceeding 3 years. The revision of the programme should take into account information from the operator's management system including the results of the CRM assessment.

(e) Command course — CRM training

The operator should ensure that elements of CRM training are integrated into the command course, as specified in Table 1 of (g).

(f) Training elements

The CRM training elements to be covered are specified in Table 1 of (g). The operator should ensure that the following aspects are addressed:

(1) Automation and philosophy on the use of automation

(i) The CRM training should include training in the use and knowledge of automation, and in the recognition of systems and human limitations associated with the use of automation. The operator should, therefore, ensure that the flight crew member receives training on:

(A) the application of the operations policy concerning the use of automation as stated in the operations manual; and

(B) system and human limitations associated with the use of automation, giving special attention to issues of mode awareness, automation surprises and over-reliance including false sense of security and complacency.

(ii) The objective of this training should be to provide appropriate knowledge, skills and attitudes for managing and operating automated systems. Special attention should be given to how automation increases the need for crews to have a common understanding of the way in which the system performs, and any features of automation that make this understanding difficult.

(iii) If conducted in an FSTD, the training should include automation surprises of different origin (system- and pilot-induced).

(2) Monitoring and intervention

Flight crew should be trained in CRM-related aspects of operation monitoring before, during and after flight, together with any associated priorities. This CRM training should include guidance to the pilot monitoring on when it would be appropriate to intervene, if felt necessary, and how this should be done in a timely manner. Reference should be made to the operator procedures for structured intervention as specified in the operations manual.

(3) Resilience development

CRM training should address the main aspects of resilience development. The training should cover:

(i) Mental flexibility

Flight crew should be trained to:

(A) understand that mental flexibility is necessary to recognise critical changes;

(B) reflect on their judgement and adjust it to the unique situation;

(C) avoid fixed prejudices and over-reliance on standard solutions; and

(D) remain open to changing assumptions and perceptions.

(ii) Performance adaptation

Flight crew should be trained to:

(A) mitigate frozen behaviours, overreactions and inappropriate hesitation; and

(B) adjust actions to current conditions.

(4) Surprise and startle effect

CRM training should address unexpected, unusual and stressful situations. The training should cover:

(i) surprises and startle effects; and

(ii) management of abnormal and emergency situations, including:

(A) the development and maintenance of the capacity to manage crew resources;

(B) the acquisition and maintenance of adequate automatic behavioural responses; and

(C) recognising the loss and re-building situation awareness and control.

(5) Cultural differences

CRM training should cover cultural differences of multinational and cross-cultural crews. This includes recognising that:

(i) different cultures may have different communication specifics, ways of understanding and approaches to the same situation or problem;

(ii) difficulties may arise when crew members with different mother tongue communicate in a common language which is not their mother tongue; and

(iii) cultural differences may lead to different methods for identifying a situation and solving a problem.

(6) Operator's safety culture and company culture

CRM training should cover the operator's safety culture, its company culture, the type of operations and the associated procedures of the operator. This should include areas of operations that may lead to particular difficulties or involve unusual hazards.

(7) Case studies

(i) CRM training should cover aircraft type-specific case studies, based on the information available within the operator's management system, including:

(A) accident and serious incident reviews to analyse and identify any associated non-technical causal and contributory factors, and instances or examples of lack of CRM; and

(B) analysis of occurrences that were well managed.

(ii) If relevant aircraft type-specific or operator-specific case studies are not available, the operator should consider other case studies relevant to the scale and scope of its operations.

(g) CRM training syllabus

Table 1 below specifies which CRM training elements should be covered in each type of training. The levels of training in Table 1 can be described as follows:

(1) 'Required' means training that should be instructional or interactive in style to meet the objectives specified in the CRM training programme or to refresh and strengthen knowledge gained in a previous training.

(2) 'In-depth' means training that should be instructional or interactive in style taking full advantage of group discussions, team task analysis, team task simulation, etc., for the acquisition or consolidation of knowledge, skills and attitudes. The CRM training elements should be tailored to the specific needs of the training phase being undertaken.

Table 1: Flight crew CRM training

CRM training elements	**Initial operator's CRM training**	**Operator conversion course when changing aircraft type**	**Operator conversion course when joining an operator**	**Annual recurrent training**	**Command course**
General principles					
Human factors in aviation; General instructions on CRM principles and objectives; Human performance and limitations; Threat and error management.	In-depth	Not required	Required	Required	Required
Relevant to the individual flight crew member					
Personality awareness, human error and reliability, attitudes and behaviours, self-assessment and self- critique; Stress and stress management; Fatigue and vigilance; Assertiveness, situation awareness, information acquisition and processing.	In-depth	Not required	Required	Required	In-depth
Relevant to the flight crew					
Automation and philosophy on the use of automation	Required	In-depth	In-depth	In-depth	In-depth

CRM training elements	Initial operator's CRM training	Operator conversion course when changing aircraft type	Operator conversion course when joining an operator	Annual recurrent training	Command course
Specific type-related differences	Required	In-depth	Not required	Required	Required
Monitoring and intervention	Required	In-depth	In-depth	Required	Required
Relevant to the entire aircraft crew					
Shared situation awareness, shared information acquisition and processing; Workload management; Effective communication and coordination inside and outside the flight crew compartment; Leadership, cooperation, synergy, delegation, decision-making, actions; Resilience development; Surprise and startle effect; Cultural differences.	In-depth	Required	Required	Required	In-depth
Relevant to the operator and the organisation					
Operator's safety culture and company culture, standard operating procedures (SOPs), organisational factors, factors linked to the type of operations; Effective communication and coordination with other operational personnel and ground services.	In-depth	Required	In-depth	Required	In-depth
Case studies	In-depth	In-depth	In-depth	In-depth	In-depth

(h) Assessment of CRM skills

(1) Assessment of CRM skills is the process of observing, recording, interpreting and debriefing crews and crew member's performance using an accepted methodology in the context of the overall performance.

(2) The flight crew member's CRM skills should be assessed in the operational environment, but not during CRM training in the non-operational environment. Nevertheless, during training in the non-operational

environment, feedback from the flight crew CRM trainer or from trainees on individual and crew performance may be given to the crew members concerned.

(3) The assessment of CRM skills should:

(i) include debriefing the crew and the individual crew member;

(ii) serve to identify additional training, where needed, for the crew or the individual crew member; and

(iii) be used to improve the CRM training system by evaluating de-identified summaries of all CRM assessments.

(4) Prior to the introduction of CRM skills assessment, a detailed description of the CRM methodology, including the required CRM standards and the terminology used for the assessment, should be published in the operations manual.

(5) Methodology of CRM skills assessment

The assessment should be based on the following principles:

(i) only observable behaviours are assessed;

(ii) the assessment should positively reflect any CRM skills that result in enhanced safety; and

(iii) assessments should include behaviour that results in an unacceptable reduction in safety margin.

(6) Operators should establish procedures, including additional training, to be applied in the event that flight crew members do not achieve or maintain the required CRM standards.

AMC2 ORO.FC.115 Crew resource management (CRM) training

CRM TRAINING — SINGLE-PILOT OPERATIONS

(a) For single-pilot helicopter operations with technical crew, AMC1 ORO.FC.115 should be applied.

(b) For single-pilot operations other than those specified in (a), AMC1 ORO.FC.115 should be applied with the following differences:

(1) Relevant training

Training should cover the relevant CRM training, i.e. initial operator's training, the operator conversion course and recurrent training.

(2) Relevant training elements CRM training should focus on the elements specified in Table 1 of (g) of AMC1 ORO.FC.115 which are relevant to single-pilot operations. Therefore, single-pilot CRM training should include, among others:

(i) situation awareness;

(ii) workload management;

(iii) decision-making;

(iv) resilience development;

(v) surprise and startle effect; and

(vi) effective communication and coordination with other operational personnel and ground services.

(3) Virtual classroom training

Notwithstanding (a)(2) of AMC1 ORO.FC.115, classroom training may take place remotely, using a videoconferencing tool. The tool should permit real-time interaction between the trainees and the trainer, including speech and elements of body language. It should also be capable of transmitting any document to the trainee that the trainer wishes to present. The CRM trainer should establish the list of trainees in advance. Their numbers should be limited to 6 to ensure a sufficient level of interaction during the training session.

(c) Operation with ELA2 aircraft

Notwithstanding (1) and (2), for operations with ELA2 aircraft the relevant CRM training and its duration should be determined by the operator, based on the aircraft type and the complexity of the operation.

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

FLIGHT CREW CRM TRAINER

(a) Applicability

The provisions described herein:

(1) should be fulfilled by flight crew CRM trainers responsible for classroom CRM training; and

(2) are not applicable to:

(i) instructors, holding a certificate in accordance with BAR 1 Part-FCL, when conducting CRM training in the operational environment; and

(ii) trainers or instructors when conducting training other than CRM training, but integrating CRM elements into this training.

(b) Qualification of flight crew CRM trainer

(1) Prerequisites. A flight crew CRM trainer should:

(i) have adequate knowledge of human performance and limitations (HPL), whilst:

(A) having obtained a commercial pilot licence in accordance with BAR 1 Part-FCL; or

(B) having followed a theoretical HPL course covering the whole syllabus of the HPL examination;

(ii) have completed flight crew initial operator's CRM training;

(iii) have received training in group facilitation skills, except for instructors holding a certificate in accordance with Commission Regulation (EU) No 1178/2011.

(2) In order to qualify as flight crew CRM trainer, a person meeting the prerequisites should:

(i) have adequate knowledge of the relevant flight operations at one operator, in accordance with (d);

(ii) receive the initial training in accordance with (c)(3); and

(iii) be assessed by that operator in accordance with (f).

(3) In order to act as flight crew CRM trainer at an operator, a qualified and current flight crew CRM trainer should meet one of the following conditions:

(i) have adequate knowledge of the relevant flight operations at that operator, in accordance with (d); or

(ii) be part of a team of trainers in accordance with (e).

(4) The period of validity of the flight crew CRM trainer qualification should be 3 years.

(5) Recency and renewal of the flight crew CRM trainer qualification

(i) The flight crew CRM trainer should complete CRM trainer refresher training within the last 12 months of the 3-year validity period; and

(ii) The flight crew CRM trainer should meet one or both of the following conditions:

(A) conduct at least 3 CRM training events within the 3-year validity period;

(B) be assessed within the last 12 months of the 3-year validity period in accordance with (f); and

(iii) If the flight crew CRM trainer qualification has expired, it can be renewed if all of the conditions below are met. The validity should be 3 years after completion of (A) and (C) below, whichever comes first:

(A) complete CRM trainer refresher training;

(B) receive refresher training on knowledge of the relevant flight operations, as necessary;

(C) be assessed in accordance with (f).

(c) Training of flight crew CRM trainer

(1) If the operator trains flight crew CRM trainers, the training syllabi should be described in the operations manual. The operator should ensure that the initial and refresher training of the flight crew CRM trainers are conducted by flight crew CRM trainers with a minimum of 3 years of experience.

(2) Training of flight crew CRM trainers should be both theoretical and practical. Practical elements should include the development of specific trainer skills, particularly the integration of CRM into line operations.

(3) The initial training of flight crew CRM trainers should include the following:

(i) introduction to CRM training and competencies for CRM trainers:

(A) ability to interact with and manage a group;

(B) ability to pre-plan an objective and timely training session;

(C) ability to deliver a good balance of 'telling', 'selling' and 'facilitating';

(D) ability to connect realistically poor and good CRM to the operations;

(E) ability to assess the performance, the progress and needs of trainees in a meaningfully way;

(ii) operator's management system as defined in point (a)(7) of AMC1 ORO.FC.115; and

(iii) characteristics of the flight crew CRM training as defined in Table 1 of AMC1 ORO.FC.115 and its integration into line operations:

(A) of the different types of CRM trainings (initial, recurrent, etc.);

(B) of combined training; and

(C) training related to the type of aircraft or operation.

Instructors holding a certificate in accordance with Commission Regulation (EU) No 1178/2011 may be credited towards (i) and (ii) if they have completed the refresher training defined in (4).

(4) The refresher training of flight crew CRM trainers should include new methodologies, procedures and lessons learned as well as additional topics such as the following:

(i) Group facilitation skills including team dynamics, moderation skills and use of questions

(ii) Course preparation, defining objectives and selecting methods to best convey knowledge (e.g. lecture, group work, case analysis, gamification, scenario-based training, individual research)

(iii) Safety culture and management systems

(iv) An example of an analysis of CRM factors in an accident or serious incident.

(v) New developments or research in human factors and CRM

(vi) TEM principles and their practical implementation in normal operations

(5) Instructors, holding a certificate in accordance with BAR 1 Part-FCL, who are also CRM trainers, may combine the CRM trainer refresher training with instructor refresher training if the instructor refresher training meets all of the conditions defined in (4).

(6) Instructors for other-than complex motor-powered aeroplanes should be qualified as flight crew CRM trainers for this aircraft category with no additional training, as specified in (3) and (4) when:

(i) holding a certificate in accordance with BAR 1 Part-FCL; and

(ii) fulfilling the provisions of (b)(2) or (b)(5).

(d) Knowledge of the relevant flight operations

(1) The operator should evaluate the experience and knowledge of the flight crew CRM trainer. The evaluation of the operator should include at least:

(i) the operational experience of the flight crew CRM trainer as a flight crew member;

(ii) whether this experience as a flight crew member or a former flight crew member covers the aircraft category, the aircraft generation and the form of operations, as relevant to the operator.

(2) If the flight crew CRM trainer does not have the relevant knowledge of the relevant flight operation based on the evaluation in (1), the operator should provide training to the flight crew CRM trainer to provide the adequate knowledge.

(3) The operator should describe the assessment and training in the operations manual.

(e) Team of CRM trainers

If the flight crew CRM trainer is qualified in accordance with (b) but does not meet the conditions defined in (d), he or she may be assisted by a training assistant that has the knowledge of the relevant flight operations. The operator should ensure that all the following conditions are met:

(1) The training assistant should meet the condition defined in (c) but needs not meet the conditions defined in (b). The training assistant should be an instructor or have experience in ground training.

(2) The flight crew CRM trainer and the training assistant should prepare the training session together and adapt it to the operational needs of the operator.

(3) If the flight crew CRM trainer and the training assistant have already provided training for the operator or for a similar operator, the operator may determine that condition (2) is met.

(4) The flight crew CRM trainer and the training assistant should provide the training together.

(5) The flight crew CRM trainer remains responsible for the training.

(f) Assessment of a flight crew CRM trainer

(1) The operator should ensure that the process for the assessment is included in the operations manual describing methods for observing, recording, interpreting and debriefing the flight crew CRM trainer. All personnel involved in the assessment must be credible and competent in their role.

(2) The assessment should enable the flight crew CRM trainer to demonstrate the knowledge and ability to train the CRM training elements in the non-operational environment. Special attention should be given to fields such as group management, group dynamics and personal awareness.

(3) The initial assessment of a flight crew CRM trainer by the operator may take place when conducting their first CRM training course.

(4) The assessment of flight crew CRM trainers should be conducted by flight crew CRM trainers with a minimum of 3 years of experience.

GM1 ORO.FC.115 Crew resource management (CRM) training

GENERAL

(a) CRM is the effective utilisation of all available resources (e.g. crew members, aircraft systems, supporting facilities and persons) to achieve safe and efficient operation.

(b) The objective of CRM is to enhance the communication and management skills of the flight crew member concerned. Emphasis is placed on the non-technical knowledge, skills and attitudes of flight crew performance.

GM2 ORO.FC.115 Crew resource management (CRM) training

TRAINING ENVIRONMENT, TRAINERS AND INSTRUCTORS

(a) Flight crew CRM training can be separated as follows:

(1) training in the non-operational environment:

(i) classroom; and

(ii) computer-based;

(2) training in the operational environment:

(i) flight simulation training device (FSTD); and

(ii) aircraft.

(b) In general, CRM training is provided as follows:

(1) classroom training by a flight crew CRM trainer;

(3) training in the operational environment by an instructor holding a certificate in accordance with BAR 1 Part-FCL;

(4) computer-based training as a self-study training method. If needed, directions concerning CRM-related issues are provided by a flight crew CRM trainer or by an instructor holding a certificate in accordance with BAR 1 Part-FCL.

GM3 ORO.FC.115 Crew resource management (CRM) training

MINIMUM TRAINING TIMES

(a) The following minimum training times are appropriate:

(1) multi-pilot operations:

(i) combined CRM training: 6 training hours over a period of 3 years, or, for EBT operators, a minimum of 3 training hours within 3 years; and

(ii) initial operator's CRM training: 18 training hours with a minimum of 12 training hours in classroom training;

(2) initial operator's CRM training for single-pilot operations: 6 training hours; and

(3) flight crew CRM trainer:

(i) basic training:

(A) 18 training hours for trainees holding an instructor certificate for complex motor-powered aircraft, as specified in BAR 1 Part-FCL, which includes 25-hour training in teaching and learning; or

(B) 30 training hours for trainees who do not hold an instructor certificate as specified in (A); and

(ii) refresher training: 6 training hours.

(b) 'Training hours' means actual training time excluding breaks and assessment.

GM4 ORO.FC.115 Crew resource management (CRM) training

DESIGN, IMPLEMENTATION AND EVALUATION OF CRM TRAINING

The checklist in Table 1 provides guidance on the design, implementation and evaluation of CRM training, and on their incorporation into the operator's safety culture. Elements of the operator's management systems and the competency-based approach are incorporated in the checklist.

Table 1 — Checklist for design, implementation, evaluation and incorporation of CRM training

Step No	Description	Element
1	Needs analysis	Determine the necessary CRM competencies
		Develop CRM training goals
		Ensure the organisation is ready for CRM training
2	Design	Develop CRM training objectives
		Determine what to measure and how to measure it
3	Development	Describe the CRM learning environment
		Develop full-scale prototype of training
		Validate and modify CRM training
4	Implementation	Prepare trainees and environment
		Set a climate for learning (e.g. practice and feedback)
		Implement the CRM training programme
5	Evaluation	Determine training effectiveness
		Evaluate CRM training at multiple levels
		Revise the CRM training programme to improve effectiveness
6	Incorporation	Establish an environment where CRM training is positively recognised
		Reinforce CRM behaviours in daily work
		Provide recurrent CRM training

GM5 ORO.FC.115 Crew resource management (CRM) training

RESILIENCE DEVELOPMENT

(a) The main aspects of resilience development can be described as the ability to:

(1) learn ('knowing what has happened');

(2) monitor ('knowing what to look for');

(3) anticipate ('finding out and knowing what to expect'); and

(4) respond ('knowing what to do and being capable of doing it').

(b) Operational safety is a continuous process of evaluation of and adjustment to existing and future conditions. In this context, and following the description in (a), resilience development involves an ongoing and adaptable process including situation assessment, self-review, decision and action. Training in resilience development enables crew members to draw the right conclusions from both positive and negative experiences. Based on those experiences, crew members are better prepared to maintain or create safety margins by adapting to dynamic complex situations.

(c) The training topics in (f)(3) of AMC1 ORO.FC.115 are to be understood as follows:

(1) Mental flexibility

(i) The phrase 'understand that mental flexibility is necessary to recognise critical changes' means that crew members are prepared to respond to situations for which there is no set procedure.

(ii) The phrase 'reflect on their judgement and adjust it to the unique situation' means that crew members learn to review their judgement based on the unique characteristics of the given circumstances.

(iii) The phrase 'avoid fixed prejudices and over-reliance on standard solutions' means that crew members learn to update solutions and standard response sets, which have been formed on prior knowledge.

(iv) The phrase 'remain open to changing assumptions and perceptions' means that crew members constantly monitor the situation, and are prepared to adjust their understanding of the evolving conditions.

(2) Performance adaptation

(i) The phrase 'mitigate frozen behaviours, overreactions and inappropriate hesitation' means that crew members correct improper actions with a balanced response.

(ii) The phrase 'adjust actions to current conditions' means that crew members' responses are in accordance with the actual situation.

GM6 ORO.FC.115 Crew resource management (CRM) training

NON-TECHNICAL SKILLS ASSESSMENT

(a) NOTECHS (non-technical skills) is a validated method for assessing flight crew CRM skills. The NOTECHS framework consists of four main categories:

(1) Cooperation: Cooperation is the ability to work effectively in a crew.

(2) Leadership and managerial skills: Effective leadership and managerial skills help to achieve joint task completion within a motivated, fully functioning team through coordination and persuasiveness.

(3) Situation awareness: Situation awareness relates to one's ability to accurately perceive what is in the flight crew compartment and outside the aircraft. It is also one's ability to comprehend the meaning of different elements in the environment and the projection of their status in the near future.

(4) Decision-making: Decision-making is the process of reaching a judgement or choosing an option.

(b) Each of the four categories is subdivided into elements and behavioural markers. The elements are specified in Table 1 with examples of behavioural markers (effective behaviour). The behavioural markers are assessed by a rating scale to be established by the operator.

Table 1 — Categories, elements and behavioural markers of NOTECHS

Category	Element	Behavioural marker (examples)

Cooperation	Team building and maintaining	Establishes atmosphere for open communication and participation
	Considering others	Takes condition of other crew members into account
	Supporting others	Helps other crew members in demanding situations
	Conflict solving	Concentrates on what is right rather than who is right
Leadership and managerial skills	Use of authority and assertiveness	Takes initiative to ensure crew involvement and task completion
	Maintaining standards	Intervenes if task completion deviates from standards
	Planning and coordination	Clearly states intentions and goals
	Workload management	Allocates adequate time to complete tasks
Situation awareness	Awareness of aircraft systems	Monitors and reports changes in systems' states
	Awareness of external environment	Collects information about environment (position, weather and traffic)
	Anticipation	Identifies possible future problems
Decision-making	Problem definition and diagnosis	Reviews causal factors with other crew members
	Option generation	States alternative courses of action
		Asks other crew members for options
	Risk assessment and option selection	Considers and shares estimated risk of alternative courses of action
	Outcome review	Checks outcome against plan

GM7 ORO.FC.115 Crew resource management (CRM) training

FLIGHT CREW CRM TRAINER ASSESSMENT

(a) For assessing flight crew CRM trainers, the operator may nominate experienced flight crew CRM trainers who have demonstrated continued compliance with the provisions for a flight crew CRM trainer and capability in that role for at least 3 years.

(b) An operator that does not have the resources to conduct the assessment may employ a contractor. The standard as regards the assessment is confirmed on a 3-year basis by the operator.

(c) The checklist in Table 1 provides guidance on the assessment of a flight crew CRM trainer. If a flight crew CRM trainer is competent in his/her role, the response to the questions in Table 1 should be 'yes'. When answering the questions in Table 1, justifications and examples related to the responses given should be provided.

Table 1 — Flight crew CRM trainer assessment checklist

Questions to assess a flight crew CRM trainer	**Response yes/no**
Did the CRM trainer demonstrate the knowledge required for the role?	
Did the CRM trainer support CRM concepts?	
Did the CRM trainer encourage trainees to participate, share their experiences and self-analyse?	
Did the CRM trainer identify and respond to the trainees' needs relative to expertise/experience?	
Did the CRM trainer show how CRM is integrated in technical training and line operations?	
Did the CRM trainer incorporate company CRM standards when appropriate?	
Did the CRM trainer identify and discuss the non-technical reasons involved in accidents, incidents and events included in case studies?	
Did the CRM trainer regularly check for understanding and resolve ambiguities?	
Did the CRM trainer demonstrate effective instruction and facilitation skills?	

GM8 ORO.FC.115 Crew resource management (CRM) training

VIRTUAL CLASSROOM TRAINING — SINGLE-PILOT OPERATIONS

(a) A successful virtual classroom training relies on the ability of the trainer to make best use of the associated technologies in the context of CRM training. The flight crew CRM trainer may need to receive appropriate training covering the following:

(1) learning style;

(2) teaching method associated with virtual classroom instruction, such as videoconferencing, and a familiarisation with the virtual classroom instruction system in use, including management of time, training media and equipment and tools.

(b) The assessment of CRM skills may be used by the operator to improve the CRM training system by evaluating de-identified summaries of all CRM assessments.

(c) The requirement of ORO.GEN.140 for the operator to grant access to the competent authority also applies to the virtual classroom training.

(d) More information on virtual classroom training is provided in the EASA Guidance for allowing virtual classroom instruction and distance learning.

AMC1 ORO.FC.120 Operator conversion training

OPERATOR CONVERSION TRAINING FOR NON-COMMERCIAL OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT (NCC)

(a) General

(1) The operator conversion training should include:

(i) ground training, including the following:

(A) aircraft systems;

(B) normal procedures, which include flight planning, ground-handling and flight operations, including performance, mass and balance, fuel schemes, selection of alternates, and ground de-icing/anti-icing;

(C) abnormal and emergency procedures, which include pilot incapacitation, as applicable;

(D) a review of relevant samples of accidents/incidents and occurrences to increase awareness of the occurrences that may be relevant for the intended operation;

(ii) emergency and safety equipment training and checking, including survival equipment training (completed before operating on any passenger-carrying flight);

(iii) passenger handling for operations where no cabin crew is carried; and

(iv) a minimum number of sectors and/or flight hours operated under the supervision of a flight crew member nominated by the operator, to demonstrate the standard of qualification specified in the operator's manual.

(1) The operator conversion course may be combined with a new type rating course, as required by BAR 1 Part FCL.

(2) The conversion training should ensure that each flight crew member:

(i) has been trained to competency on the emergency and safety equipment installed on the aircraft they are to operate; and

(ii) is competent in the operating procedures and the use of checklists used by the operator.

(b) Emergency and safety equipment training should:

(1) take place in conjunction with cabin crew and technical crew as far as practicable. Emphasis should be placed on the importance of effective coordination and two-way communication between crew members in various emergency situations;

(2) address the operational procedures of rescue and emergency services; and

(3) cover the items of point (a)(2) of AMC1 ORO.FC.130.

AMC2 ORO.FC.120 Operator conversion training

FORM OF OPERATIONS — SINGLE-PILOT HELICOPTERS

The training for conversion from single-pilot operations to multi-pilot operations and vice versa on a given helicopter type, as specified in point FCL.725(d)(2) of BAR 1 Part FCL, should take into account all of the following:

(a) the SOPs of the operator;

(b) the flight crew member's previous trainings and experience.

AMC3 ORO.FC.120 Operator conversion training

SPO OPERATOR CONVERSION COURSE — GROUND TRAINING

(a) General

The operator conversion training should include ground training and checking, including all of the following:

(1) aircraft systems,

(2) normal procedures, which include flight planning ground-handling and flight operations, including performance, mass and balance, fuel schemes selection of alternates, and ground de-icing/anti-icing;

(3) abnormal and emergency procedures, which include pilot incapacitation as applicable;

(4) a review of relevant samples of accident/incident and occurrences to increase awareness of the occurrences that may be relevant for the intended operation.

SPECIALISED OPERATIONS

If a flight crew member undergoes training with regard to SOPs related to a specialised operation, either as part of an equipment and procedure training or a conversion training, the following should apply:

(b) Initial training for a given specialised operation

(1) In-depth training should achieve competence in carrying out normal, abnormal and emergency procedures, covering the SOPs associated with the specialised task.

(2) The training should include ground training associated with the specialised task, completed before any flight training in an aircraft commences.

(3) If one or more task specialists are on board, the training should include emergency and safety equipment training, completed before any flight training in an aircraft commences. The training should ensure that all emergency equipment can be used timely and efficiently, that an emergency evacuation and first aid can be conducted, taking into account the training and operating procedures of the task specialist(s).

(4) Unless the flight crew member has significant experience in similar specialised operations as defined in the operations manual, the training should include aircraft/FSTD training associated with the specialised task.

(c) Initial training and experience for any level of HEC and HESLO operations: AMC1 SPO.SPEC.HEC.100 and AMC1 SPO.SPEC.HESLO.100 should apply in combination with point (b) above.

(d) Training when changing operators

(1) The training should focus on the elements of the SOPs that are specific to the operator.

(2) The operator should determine the amount of training required in the operator's conversion course in accordance with the standards of qualification and experience specified in the operations manual, taking into account the flight crew member's previous training and experience in the given specialised operation and in similar operations.

(e) Training when changing specialised operations within the same operator, with previous experience of the specialised operation: point (d) above should apply.

(f) Training when changing types or variants: The training should focus on the elements of the SOPs that are specific to the type or variant. The operator should assess whether the flight crew should require ground training, aircraft/FSTD training or both, when changing type or variants within the framework of the same specialised operations. The assessment should take the following into account:

(1) the validity of the flight crew type rating;

(2) the experience and recency of the flight crew on the type or variant;

(3) whether any type or variant specific procedures exist;

(4) differences in equipment related to the specialised operations;

(5) differences in limitations or procedures related to the specialised operations.

GM1 ORO.FC.120 Operator conversion training

STANDARD OPERATING PROCEDURES FOR MULTI-PILOT OPERATIONS — SINGLE-PILOT HELICOPTERS

MCC training is generic to all types. A pilot holding a certificate of completion of MCC training requires additional training to implement the multi-pilot SOPs of a given helicopter type.

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

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

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

(a) operator conversion training; and

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

Element	Theoretical Knowledge	Practical training
Basic flight physics principles concerning flight at high altitude, with a particular emphasis on the relative proximity of the critical Mach number and the stall, pitch behaviour, and an understanding of the reduced stall angle of attack when compared with low-altitude flight.	•	•
Interaction of the automation (autopilot, flight director, auto- throttle/auto-thrust) and the consequences of failures inducing disconnection of the automation.	•	•
Consequences of an unreliable airspeed indication and other failures at high altitude and the need for the flight crew to promptly identify the failure and react with appropriate (minimal) control inputs to keep the aircraft in a safe envelope.	•	•
Degradation of fly-by-wire (FBW) flight control laws/modes and its consequence on aircraft stability and flight envelope protections, including stall warnings.	•	•
Practical training, using appropriate simulators, on manual handling at high altitude in normal and non-normal flight control laws/modes, with particular emphasis on pre-stall buffet, the reduced stall angle of attack when compared with low-altitude flight and the effect of pitch inputs on the aircraft trajectory and energy state.		•
The requirement to promptly and accurately apply the stall recovery procedure, as provided by the aircraft manufacturer, at the first indication of an impending stall. Differences between high-altitude and low-altitude stalls must be addressed.	•	•
Procedures for taking over and transferring manual control of the aircraft, especially for FBW aeroplanes with independent side-sticks.	•	•
Task sharing and crew coordination in high workload/stress conditions with appropriate call-out and acknowledgement to confirm changes to the aircraft flight control law/mode.	•	•

AMC1 ORO.FC.125 Differences training, familiarisation, equipment and procedure training

GENERAL

(a) Differences training requires additional knowledge and training on the aircraft or an appropriate training device. It should be carried out:

(1) in the case of aeroplanes, when operating another variant of an aeroplane of the same type or another type of the same class currently operated; or

(2) in the case of helicopters, when operating a variant of a helicopter currently operated.

(b) Familiarisation requires only the acquisition of additional knowledge. It should be carried out when operating another helicopter or aeroplane of the same type.

AMC2 ORO.FC.125 Differences training, familiarisation, equipment and procedure training

OPERATOR DIFFERENCE REQUIREMENTS (ODRs)

When defining the needs for differences training, familiarisation or equipment training, the operator should make use of the concept of ODRs and of the methodology described in AMC1 ORO.FC.140(a), including the ODRs tables.

FORM OF OPERATIONS — SINGLE-PILOT HELICOPTERS

If the differences training, familiarisation, equipment or procedure training includes the conversion from single-pilot operations to multi-pilot operations and vice versa, it should take into account all elements described in AMC2 ORO.FC.120.

GM1 ORO.FC.125 Differences training, familiarisation, equipment and procedure training

OPERATOR DIFFERENCE REQUIREMENTS (ODRs)

The ODRs tables may result in different training programmes, depending on the training needs, regardless of the 'base aircraft' used to establish the table (e.g. the trainee may know the 'other aircraft' and be trained towards the 'base aircraft').

AMC1 ORO.FC.125(b) Differences training, familiarisation, equipment and procedure training

SPECIALISED OPERATIONS

If the differences training, familiarisation, equipment and procedure training includes training for SOPs related to a specialised operation, points (b) to (f) of AMC3 ORO.FC.120 should apply.

GM1 ORO.FC.125(b) Differences training, familiarisation, equipment and procedure training

GENERAL

Introducing a change of equipment and/or procedures on types or variants currently operated may require additional knowledge or additional training on the aircraft, or an appropriate training device, or both.

GM2 ORO.FC.125(b) Differences training, familiarisation, equipment and procedure training

PROCEDURE TRAINING — STANDARD OPERATING PROCEDURES FOR MULTI-PILOT OPERATIONS — SINGLE-PILOT HELICOPTERS

MCC training is generic to all types. A pilot holding a certificate of completion of MCC training requires additional procedures training to implement the multi-pilot SOPs of a given single-pilot helicopter type.

AMC1 ORO.FC.130 Recurrent training and checking

RECURRENT TRAINING AND CHECKING TO DEMONSTRATE COMPETENCE FOR NON-COMMERCIAL OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT (NCC)

(a) Recurrent training

Recurrent training should comprise the following:

(1) Ground training The ground training programme should include:

(i) aircraft systems;

(ii) normal procedures, which include flight planning, ground-handling and flight operations, including performance, mass and balance, fuel schemes, selection of alternates, and ground de-icing/anti-icing;

(iii) abnormal and emergency procedures, which include pilot incapacitation as applicable;

(iv) a review of relevant samples of accidents/incidents and occurrences to increase awareness of the occurrences that may be relevant for the intended operation;

(2) Emergency and safety equipment training

(i) Emergency and safety equipment training may be combined with emergency and safety equipment checking and should be conducted in an aircraft or a suitable alternative training device.

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

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

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

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

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

(E) instruction on the location and use of all types of exits.

(3) Elements of CRM as specified in Table 1 of AMC1 ORO.FC.115 should be integrated into all appropriate phases of recurrent training.

(4) Aircraft/FSTD training

(i) The aircraft/FSTD training programme should be established in such a way that all the major failures of aircraft systems and associated procedures will have been covered in the preceding 3-year period.

(ii) When engine-out manoeuvres are carried out in an aircraft, the engine failure should be simulated.

(iii) When an FSTD is not available or accessible, the operator should establish mitigating measures to ensure that an adequate level of safety is maintained when conducting the training or checking in an aircraft. If one or more of the major failures cannot be practised in the aircraft because of their associated risks or because of environmental considerations, the failure(s) may be partially replicated for crew training purposes using pre-briefed, risk-assessed measures that avoid degrading the aircraft's performance below a predetermined level, and which permit immediate reversion to normal operating conditions.

(b) periodic check to demonstrate competence

(1) Each flight crew member should complete the periodic check as part of the normal crew complement.

(2) Periodic demonstrations of competence should be conducted every 12 months and may be combined with the proficiency check required by BAR 1 Part FCL.

GM1 ORO.FC.130 Recurrent training and checking

PERIODIC CHECKS

(a) For CAT operations, the operator proficiency checks and the line checks are both part of the periodic checks. For EBT operators, the EBT module and the line evaluations of competence are both part of the periodic checks.

(b) For SPO operations, the operator proficiency checks are part of the periodic checks.

(c) For non-CAT operations, the periodic checks may include a line check.

AMC1 ORO.FC.130(a) Recurrent training and checking

OPERATIONS WITH VARIATIONS IN AIRCRAFT CONFIGURATION

AMC1 ORO.FC.140(a) should be used to determine the recurrent ground training and checking relevant to variations in aircraft configuration, if all of the following apply:

(a) the pilot operates variations in aircraft configuration;

(b) the aircraft operated do not all belong to the same group of types defined under ORO.FC.140(b); and

(c) credit (as defined in point (a)(4) of AMC1 ORO.FC.140(a)) is sought.

AMC1 ORO.FC.135 Pilot qualification to operate in either pilot's seat

GENERAL

The training and checking for pilot qualification to operate in either pilot's seat should include any safety-critical items as specified in the operations manual where the action to be taken by the pilot is different depending on which seat they occupy.

NON-COMMERCIAL OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT (NCC)

Training should be arranged so that all such items will have been covered in the preceding 3-year period.

GM1 ORO.FC.140 Operation on more than one type or variant

GENERAL

(a) The concept of operating more than one type or variant depends on the experience, knowledge and ability of the operator and the flight crew concerned.

(b) The first consideration is whether operations on one aircraft type or variant allow the safe operation of all other types and variants.

(c) The second consideration is whether and how adequate training to address potential confusion and increased workload caused by the operation of several types or variants is achieved.

AMC1 ORO.FC.140(a) Operation on more than one type or variant

GENERAL

(a) Terminology The terms used in the context of operation on more than one type or variant have the following meaning:

(1) 'Base aircraft' refers to an aircraft used as a reference to compare differences with another aircraft.

(2) 'Variant' refers to an aircraft or a group of aircraft within the same pilot type or class rating that has differences with the base aircraft and requires differences training or familiarisation.

(3) A 'variation in aircraft configuration' refers to an aircraft or a group of aircraft within the same variant that has differences with the base aircraft and requires equipment and procedure training.

(4) 'Credit' refers to the recognition of recurrent training, checking or recent experience based on commonalities between aircraft.

(5) 'Operator difference requirements (ODRs)' refer to a formal description of differences between types or variants or aircraft configurations flown by a particular operator.

(6) 'Training' refers to differences training, familiarisation and equipment training.

(7) 'Currency' refers to the recurrent training on types and variants.

(b) Scope of ODRs

The operator should use the ODRs methodology, a means of evaluating aircraft differences and similarities, in order to define the training and checking in the following cases:

(1) for the introduction of a change of equipment on a type or variant currently operated;

(2) for the introduction of a new variant within a type or class currently operated;

(3) for the recurrent training and checking of variations in aircraft configuration. The operator may define credit based on ODRs tables;

(4) for the operation of more than one type or variant when credit is sought, in which case all of the following should apply:

(i) All training, checking and currency requirements should be completed independently for each type or variant unless credits have been established by using ODRs tables.

(ii) All recent experience requirements should be completed independently for each type unless credits have been established by using ODRs tables.

(iii) The operator may define credit based on ODRs tables that should not be less restrictive than the OSD.

(c) ODRs methodology

(1) The operator should conduct a detailed evaluation of the differences or similarities of the aircraft concerned in order to establish appropriate procedures or operational restrictions. This evaluation should be based on the OSD for the relevant types or variants and should be adapted to the operator's specific variations in aircraft configuration. This evaluation should take into account all of the following:

(i) the level of technology;

(ii) operational procedures; and

(iii) handling characteristics.

(2) ODRs tables

The operator should first nominate one aircraft as the base aircraft from which to show differences with the second aircraft type or variant or variation in aircraft configuration, the 'difference aircraft', in terms of technology (systems), procedures, pilot handling and aircraft management. These differences, known as ODRs, preferably presented in tabular format, constitute part of the justification for operating more than one type or variant and also the basis for the associated differences/familiarisation or reduced type rating training for the flight crew.

(3) The ODRs tables should be presented as follows:

GENERAL OPERATOR DIFFERENCE REQUIREMENTS TABLE										
DIFFERENCE AIRCRAFT: **BASE AIRCRAFT:**					**COMPLIANCE METHOD**					
					TRAINING				**CHECKING/ CURRENCY**	
General	**Differences**	**Fit char**	**Proc Chg**	**A**	**B**	**C**	**D**	**E**	**FLT CHK**	**CURRENCY**
GENERAL	Range	No	Yes		CBT					

	ETOPS certified									
DIMENSIONS	Configuration per AFM, FCOM	Yes	No		CBT					

SYSTEM OPERATOR DIFFERENCE REQUIREMENTS TABLE										
DIFFERENCE AIRCRAFT: **BASE AIRCRAFT:**					**COMPLIANCE METHOD**					
					TRAINING				**CHECKING/ CURRENCY**	
System	**Differences**	**Fit char**	**Proc Chg**	**A**	**B**	**C**	**D**	**E**	**FLT CHK**	**CURRENCY**
21 – AIR CONDITIONING	CONTROLS AND INDICATORS: - Panel layout	No	Yes	HO						
21 – AIR CONDITIONING	PACKS: - Switch type - Automatically controlled - Reset switch for both packs	Yes	No		CBT	FTD				

MANOEUVRE OPERATOR DIFFERENCE REQUIREMENTS TABLE										
DIFFERENCE AIRCRAFT: **BASE AIRCRAFT:**					**COMPLIANCE METHOD**					
					TRAINING				**CHECKING/ CURRENCY**	
Manoeuvre	**Differences**	**Fit char**	**Proc Chg**	**A**	**B**	**C**	**D**	**E**	**FLT CHK**	**CURRENCY**
Exterior Preflight	Minor differences	No	No	HO						
Preflight	Differences due to systems, ECL	No	Yes		CBT			FS		
Normal take-off	FBW handling v conventional; AFDS TAKE-OFF: Autothrottle engagement FMA indications	No	Yes							

(4) Compilation of ODRs tables

(i) ODRs 1: General

The general characteristics of the candidate aircraft are compared with the base aircraft with regard to:

(A) general dimensions and aircraft design (number and type of rotors, wing span or category);

(B) flight deck general design;

(C) cabin layout;

(D) engines (number, type and position);

(E) limitations (flight envelope).

(ii) ODRs 2: Systems

Consideration is given to differences in design between the candidate aircraft and the base aircraft. For this comparison, the Air Transport Association (ATA) 100 index is used. This index establishes a system and subsystem classification and then an analysis is performed for each index item with respect to the main architectural, functional and operations elements, including controls and indications on the systems control panel.

(iii) ODRs 3: Manoeuvres

Operational differences encompass normal, abnormal and emergency situations and include any change in aircraft handling and flight management. It is necessary to establish a list of operational items for consideration on which an analysis of differences can be made.

The operational analysis should take the following into account:

(A) flight deck dimensions (size, cut-off angle and pilot eye height);

(B) differences in controls (design, shape, location and function);

(C) additional or altered function (flight controls) in normal or abnormal conditions;

(D) handling qualities (including inertia) in normal and in abnormal configurations;

(E) aircraft performance in specific manoeuvres;

(F) aircraft status following failure;

(G) management (e.g. ECAM, EICAS, navaid selection, automatic checklists).

(iv) Once the differences for ODRs 1, ODRs 2 and ODRs 3 have been established, the consequences of differences evaluated in terms of flight characteristics (FLT CHAR) and change of procedures (PROC CHNG) should be entered into the appropriate columns.

(v) Difference levels — crew training, checking and currency

(A) In order to operate more than one type or variant, the operator should establish crew training, checking and currency requirements. This may be done by applying the coded difference levels from the table in point (d)(2) to the compliance method column of the ODRs tables.

(B) Differences identified in the ODRs tables as impacting flight characteristics or procedures, should be analysed in the corresponding ATA section of the ODRs manoeuvres. Normal, abnormal and emergency situations should be addressed accordingly.

(d) Difference levels

(1) Difference levels — general

Difference levels are used to identify the extent of a difference between a base and a candidate aircraft with reference to the elements described in the ODRs tables. These levels are proportionate to the differences between a base and a candidate aircraft. A range of five difference levels in order of increasing requirements, identified as A through E, are each specified for training, checking, and currency.

Difference levels apply when a difference with the potential to affect flight safety exists between a base and a candidate aircraft. Differences may also affect the knowledge, skills, or abilities required from a pilot. If no differences exist, or if differences exist but do not affect flight safety, or if differences exist but do not affect knowledge, skills or abilities, then difference levels are neither assigned nor applicable to pilot qualification. When difference levels apply, each level is based on a scale of differences related to design features, systems, or manoeuvres. In assessing the effects of differences, both flight characteristics and procedures are considered since flight characteristics address handling qualities and performance, while procedures include normal, non-normal and emergency items. Levels for training, checking, and currency are assigned independently, but are linked depending on the differences between a base and candidate aircraft. Training at level E usually identifies that the candidate aircraft is a different type from the base aircraft.

(2) Difference levels are summarised in the table below regarding training, checking, and currency.

DIFFERENCE LEVEL	TRAINING	CHECKING	CURRENCY
A	Self-instruction	Not applicable or integrated with next proficiency check	Not applicable
B	Aided instruction	Task or system check	Self-review
C	System devices	Partial proficiency check using qualified device	Designated system
D	Manoeuvre training devices1 or aircraft to accomplish specific manoeuvres	Partial proficiency check using qualified device1	Designated manoeuvre(s)1
E	FSTDs2 or aircraft	Proficiency check using FSTDs2 or aircraft	As per regulation, using FSTDs2 or aircraft

Footnote (1):

- Aeroplane: FTD level 2, or FFS, or aeroplane
- Helicopter: FTD levels 2 and 3, or FFS, or helicopter

Footnote (2):

- Aeroplane: FFS level C or D, or aeroplane
- Helicopter: FSTDs having dual qualification: FFS level B and FTD level 3, or FFS level C or D, or helicopter

Training levels A and B require knowledge, levels C and D require additional skills. Training level E means that the differences are such that type rating training is required or, in the context of equipment and procedure training, aircraft/FSTD training and checking is required.

(3) Difference levels — training

The training difference levels specified represent the minimum requirements. Devices associated with a higher difference level may be used to satisfy a training differences requirement.

(i) Level A training

Level A differences training is applicable to aircraft with differences that can adequately be addressed through self-instruction. Level A training represents a knowledge requirement such that once appropriate information is provided, understanding and compliance can be assumed to be demonstrated.

Training needs not covered by level A training may require level B training or higher, depending on the outcome of the evaluations described in the aircraft evaluation process (CS FCD.420).

(ii) Level B training

Level B differences training is applicable to aircraft with system or procedure differences that can adequately be addressed through aided instruction.

At level B aided instruction, it is appropriate to ensure pilot understanding, emphasise issues, provide a standardised method of presentation of material, or to aid retention of material following training.

(iii) Level C training

Level C differences training can only be accomplished through the use of devices capable of systems training.

Level C differences training is applicable to variants having 'part task' differences that affect skills or abilities as well as knowledge. Training objectives focus on mastering individual systems, procedures, or tasks, as opposed to performing highly integrated flight operations and manoeuvres in 'real time'. Level C may also require self-instruction or aided instruction of a pilot, but cannot be adequately addressed by a knowledge requirement alone. Training devices are required to supplement instruction to ensure attainment or retention of pilot skills and abilities to accomplish the more complex tasks, usually related to operation of particular aircraft systems.

The minimum acceptable training media for level C are interactive computer-based training, cockpit systems simulators, cockpit procedure trainers, part task trainers (such as inertial navigation system (INS), flight management system (FMS), or traffic collision avoidance system (TCAS) trainers), or similar devices.

(iv) Level D training Level D differences training can only be accomplished with devices capable of performing flight manoeuvres and addressing full task differences affecting knowledge, skills, or abilities.

Devices capable of flight manoeuvres address full task performance in a dynamic 'real time' environment and enable integration of knowledge, skills and abilities in a simulated flight environment, involving combinations of operationally oriented tasks and realistic task loading for each relevant phase of flight. At level D, knowledge and skills to complete necessary normal, non-normal and emergency procedures are fully addressed for each variant.

Level D differences training requires mastery of interrelated skills that cannot be adequately addressed by separate acquisition of a series of knowledge areas or skills that are interrelated. However, the differences are not so significant that a full type rating training course is required. If demonstration of interrelationships between the systems was important, the use of a series of separate devices for systems training would not suffice. Training for level D differences requires a training device that has accurate, high-fidelity integration of systems and controls and realistic instrument indications. Level D training may also require manoeuvre visual cues, motion cues, dynamics, control loading or specific environmental conditions. Weather phenomena such as low-visibility conditions or wind shear may or may not be incorporated. Where simplified or generic characteristics of an aircraft type are used in devices to satisfy level D differences training, significant negative training should not occur as a result of the simplification.

Appropriate devices as described in CS FCD.415(a), satisfying level D differences training range from those where relevant elements of aircraft flight manoeuvring, performance, and handling qualities are incorporated. The use of a manoeuvre training device or aircraft is limited for the conduct of specific manoeuvres or handling differences, or for specific equipment or procedures.

(v) Level E training

Level E differences training is applicable to candidate aircraft that have such significant 'full task' differences that a full type rating training course or a type rating training course with credit for previous experience on similar aircraft types is required to meet the training objectives.

The training requires a 'high-fidelity' environment to attain or maintain knowledge, skills, or abilities that can only be satisfied by the use of FSTDs or the aircraft itself as mentioned in CS FCD.415(a). Level E training, if done in an aircraft, should be modified for safety reasons where manoeuvres can result in a high degree of risk.

When level E differences training is assigned, suitable credit or constraints may be applied for knowledge, skills or abilities related to other pertinent aircraft types. The training programme should specify the relevant subjects, procedures or manoeuvres.

(4) Difference levels — checking

Differences checking addresses any pertinent pilot testing or checking. Initial and recurrent checking levels are the same unless otherwise specified. It may be possible to satisfactorily accomplish recurrent checking objectives in devices that do not meet the initial checking requirements. In such instances, the applicant may propose for revalidation checks the use of certain devices that do not meet the initial checking requirements.

(i) Level A checking

Level A differences checking indicates that no check related to differences is required at the time of differences training. However, a pilot is responsible for knowledge of each variant flown.

(ii) Level B checking

Level B differences checking indicates that a 'task' or 'systems' check is required following initial and recurring training.

(iii) Level C checking

Level C differences checking requires a partial check using a suitable qualified device. A partial check is conducted relative to particular manoeuvres or systems.

(iv) Level D checking

Level D differences checking indicates that a partial proficiency check is required following both initial and recurrent training. In conducting the partial proficiency check, manoeuvres common to each variant may be credited and need not be repeated. The partial proficiency check covers the specified particular manoeuvres, systems or devices. Level D checking is performed using scenarios that represent a ‘real-time’ flight environment and uses qualified devices permitted for level D training or higher.

(v) Level E checking

Level E differences checking requires that a full proficiency check be conducted in FSTDs or in an aircraft as mentioned in CS FCD.415(a), following both initial and recurrent training. If appropriate, alternating Level E checking between relevant aircraft is possible and credit may be defined for procedures or manoeuvres based on commonality.

Assignment of level E checking requirements alone, or in conjunction with level E currency, does not necessarily result in assignment of a separate type rating.

(5) Difference levels — currency Differences currency addresses any currency and re-currency levels. Initial and recurrent currency levels are the same unless otherwise specified.

(i) Level A currency

Level A currency is common to each aircraft and does not require separate tracking. Maintenance of currency in any aircraft suffices for any other variant within the same type rating.

(ii) Level B currency

Level B currency is ‘knowledge-related’ currency, typically achieved through self-review by individual pilots.

(iii) Level C currency

(A) Level C currency is applicable to one or more designated systems or procedures and it relates to both skill and knowledge requirements. When level C currency applies, any pertinent lower-level currency is also to be addressed.

(B) Re-establishing level C currency When currency is lost, it may be re-established by completing required items using a device equal to or higher than that specified for level C training and checking.

(iv) Level D currency

(A) Level D currency is related to designated manoeuvres and addresses knowledge and skills required for performing aircraft control tasks in real time with integrated use of associated systems and procedures. Level D currency may also address certain differences in flight characteristics including performance of any required manoeuvres and related normal, non-normal and emergency procedures. When level D is necessary, any pertinent lower-level currency is also to be addressed.

(B) Re-establishing level D currency

When currency is lost, currency may be re-established by completing pertinent manoeuvres using a device equal to or higher than that specified for level D differences training and checking.

(v) Level E currency

(A) Level E currency requires that recent experience requirements of Part-FCL and operational requirements be complied with in each aircraft separately. Level E currency may also specify other system, procedure, or manoeuvre currency item(s) necessary for safe operations and may require procedures or manoeuvres to be accomplished in FSTDs or in an aircraft as mentioned in CS FCD.415(a). Provisions are applied in a way which addresses the required system or manoeuvre experience.

When level E is assigned between aircraft of common characteristics, credit may be permitted. Assignment of level E currency requirements does not automatically lead to a determination on same or separate type rating. Level E currency is tracked by a means that is acceptable to the competent authority.

When common take-off and landing credit (CTLC) is permitted, any credit or constraints applicable to using FSTDs, as mentioned in CS FCD.415(a), are also to be determined.

(B) Re-establishing level E currency

When currency is lost, currency may be re-established by completing pertinent manoeuvres using a device specified for level E differences training and checking.

(6) Competency regarding non-normal and emergency procedures — currency

Competency for non-normal and emergency manoeuvres or procedures is generally addressed by checking requirements. Particular non-normal and emergency manoeuvres or procedures may not be considered mandatory for checking or training. In this situation, it may be necessary to periodically practise or demonstrate those manoeuvres or procedures specifying currency requirements for those manoeuvres or procedures.

GM1 ORO.FC.140(a) Operation on more than one type or variant

OPERATOR DIFFERENCE REQUIREMENTS (ODRS)

The ODRs tables may result in different training programmes, depending on the training needs, regardless of the 'base aircraft' used to establish the table (e.g. the trainee may know the 'other aircraft' and be trained towards the 'base aircraft').

AMC1 ORO.FC.140(b) Operation on more than one type or variant

GROUPS OF SINGLE-ENGINED PISTON HELICOPTER TYPES FOR THE REVALIDATION OF THE OPC

When establishing groups of single-engined helicopter types for the purpose of crediting of proficiency checks, the operator should only take into account the helicopter types considered for crediting in AMC1 FCL.740.H(a)(3).

AMC1 ORO.FC.140(d) Operation on more than one type or variant

LINE CHECKS — HELICOPTERS

(a) Prior to using a line check on one helicopter type or variant to revalidate the line check on other helicopter types or variants, the operator should consider whether the type of operations are sufficiently similar in terms of:

   (1) use of aerodromes or operating sites;

   (2) day VFR or night VFR

   (3) use of operational approvals and specific approvals;

   (4) normal procedures, including flight preparation, take-off and landing procedures; and

   (5) use of automation.

(b) For IFR operations of helicopters, an operation should only be considered sufficiently similar to allow a line check on one type or variant to revalidate the line check for the other type or variant if such credits are defined in the operational suitability data established in accordance with BAR 8 , as determined in point (a) of ORO.FC.140.

(c) Line check cross-crediting should be defined in the operations manual.

AMC1 ORO.FC.145 Provision of training, checking and assessment

ACCEPTANCE OF PREVIOUS TRAINING FOR NON-COMMERCIAL OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT, INCLUDING NON-COMMERCIAL SPECIALISED OPERATIONS

(a) If the operator chooses to make use of previous training received by the pilot, the operator should develop a policy for the crediting of such training. Details of such policy should be included in the operations manual.

(b) The policy should as a minimum include measures to assess:

   (1) the content of the previous training;

   (2) whether the previous training was delivered by suitably qualified personnel or organisations;

   (3) whether the aircraft, FSTD or other equipment used for the previous training was sufficiently similar to the aircraft and equipment the crew member will operate; and

   (4) whether the operating procedures used during such previous training were sufficiently representative of the procedures used by the new operator.

(c) Where previous training delivered by other suitably qualified personnel or organisations is found to satisfy all or some of the requirements in ORO.FC.120, the training may be credited and an abbreviated conversion course may be used. Such an abbreviated course should cover all items not credited from previous training.

(d) Where a pilot flies for more than one operator and the training delivered by that other operator is found to satisfy some of the requirements of ORO.FC.130, then such training may be credited and an abbreviated recurrent training programme may be used. Such an abbreviated recurrent training programme should cover all items not credited from the training delivered by the other operator.

(e) An aircraft operator remains responsible for all training required by this Part regardless of whether the training is conducted by the operator, another operator, a certified organisation or another subcontractor, as defined in ORO.GEN.205.

(f) An operator accepting any previous training should be satisfied that the flight crew member is competent to operate in accordance with that operator's procedures and to use the specific equipment installed on the aircraft to be operated.

(g) Previous training needs to be formally documented.

(h) The assessment under (b) and the documents referred to under (g) should be stored as part of the crew member training, checking and qualifications records.

GM1 ORO.FC.145 Provision of training, checking and assessment

POLICY FOR ACCEPTANCE OF PREVIOUS TRAINING AND CHECKING FOR OTHER THAN COMMERCIAL AIR TRANSPORT OPERATIONS (NCC)

If the operator chooses to make use of previous training received by the pilot, in accordance with AMC1 ORO.FC.145, the operator may wish to enter into arrangements with other operators in order to satisfy the requirements of ORO.GEN.205 in relation to contracted training providers or other aircraft operators.

AMC1 ORO.FC.145(a) Provision of training, checking and assessment

TRAINING AND CHECKING PROGRAMMES AND SYLLABI

(a) Training and checking programmes and syllabi should include as a minimum:

   (1) when training and checking take place during the same session, the distinction between the two;

   (2) a list of the items covered;

   (3) the minimum time allocation (duration);

   (4) the means of delivery (e.g. FSTD, OTD, computer-based, VR, etc.);

   (5) the personnel providing the training and conducting the checks.

(b) Further details on the training and checking programmes and syllabi should be included in the operations manual depending on the complexity of the operations (e.g. further contextualisation of the training programme, details of the airport in which some items will be covered, time allocation to brief and debrief, whether the item to be trained is a legal requirement or an SMS item, etc.).

GM1 ORO.FC.145(a) Provision of training, checking and assessment

TRAINING AND CHECKING PROGRAMMES AND SYLLABI

The syllabus lists the topics to be covered in a training and checking programme. A syllabus may include:

- the personnel providing the training and conducting the checks;
- a description of the content;
- the means of delivery (e.g. FSTD, aircraft, OTD, (virtual) classroom, computer-based training, VR, etc.);
- the minimum time allocation (duration);
- the prerequisites to be fulfilled before starting the training or checking;
- the standard of performance;
- the training objectives;
- a reference to training/checking material;
- the checking requirements, if any;
- when training and checking is combined, the distinction between trained and checked items.

AMC1 ORO.FC.145(b) Provision of training, checking and assessment

NON-MANDATORY (RECOMMENDATION) ELEMENTS OF OPERATIONAL SUITABILITY DATA

When developing the training programmes and syllabi, the operator should include the non-mandatory (recommendation) elements for the relevant type that are provided in the operational suitability data established in accordance with Part 21.

AMC1 ORO.FC.145(d) Provision of training, checking and assessment

FULL FLIGHT SIMULATORS (FFS)

The operator should classify any differences between the aircraft and FFS in accordance with the Air Transport Association (ATA) chapters as follows:

Compliance Levels

(a) Level A differences:

(1) no influence on flight characteristics;

(2) no influence on procedures (normal and/or abnormal);

(3) differences in presentation; and

(4) differences in operation.

Method: self-instruction via the operations manual or flight crew information.

(b) Level B differences:

(1) no influence on flight characteristics;

(2) influence on procedures (normal and/or abnormal); and

(3) possible differences in presentation and operation.

Method: flight crew information, computer-based training, system device training or special instruction by instructor.

(c) Level C differences:

(1) influence on flight characteristics;

(2) influence on procedures (normal and/or abnormal); and

(3) eventually differences in presentation and operation.

Method: special instruction by instructor, a selected partial training on another FSTD or aircraft or a waiver because of previous experience, special instruction or training programme.

(d) Level D differences:

(1) influence on flight characteristics; and/or

(2) influence on procedures (normal and/or abnormal); and/or

(3) differences in presentation and/or operation; and

(4) FSTD is level D qualified and is used for zero flight-time training (ZFTT).

Method: a specified partial training on another FSTD or aircraft or a waiver because of previous experience, special instruction or training programme.

AMC2 ORO.FC.145(d) Provision of training, checking and assessment

FSTDs

(a) Before the operator extracts the data from an FSTD that can be related to a pilot, it should develop a data access and security policy.

(b) ‘Availability’ and ‘accessibility’ of FSTD used in this Subpart.

(1) ‘Available FSTD’ refers to any flight simulation training device (FSTD) that is vacant for use by the FSTD operator or by the customers irrespective of any time consideration.

(2) ‘Accessible’ refers to a device that can be used by the operator to conduct training or checking pertaining to this Subpart, and by the nominated person conducting the training or checking. More information on these definitions can be found in BAR 1 Part FCL.

GM1 ORO.FC.145(d) Provision of training, checking and assessment

CONFIDENTIALITY AND PROTECTION OF TRAINING DATA IN COMMERCIAL AIR TRANSPORT

(a) Without prejudice to applicable national legislation on the protection of individuals with regard to the processing of personal data, for the training conducted in accordance with ORO.FC.145 the operator may have a training data access and security policy (including the procedure to prevent disclosure of crew identity).

(b) If the operator decides to have such a policy, it should:

(1) be agreed by all parties involved (airline management and flight crew member representatives nominated either by the union or the flight crew themselves);

(2) be in line with the organisation's safety policy in order to not make available or to not make use of the training data to attribute blame or liability.

(c) The training data access and security policy may include a policy for access to information only to specifically authorised persons identified by their position in order to perform their duties.

AMC1 ORO.FC.145(g) Provision of training, checking and assessment

VALIDITY PERIOD OF RECURRENT ASSESSMENT, TRAINING AND CHECKING

(a) When the recency, training or check is completed within the last 3 months of the validity period, the new validity period should be counted from the original expiry date.

(b) When the recency, training or check is completed before the last 3 months of the validity period, the new validity period should be counted from the end of the month when the recency, training or check was completed and not from the original expiry date.

(c) Notwithstanding (a), the revalidation of CRM instructor and EBT instructor qualifications should follow AMC2 ORO.FC.146 and AMC2 ORO.FC.146(c).

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

PERSONNEL CONDUCTING TRAINING AND CHECKING — GENERAL

Training and checking should be provided by the following personnel:

(a) Ground and refresher training by suitably qualified personnel;

(b) Emergency and safety equipment training and checking by suitably qualified personnel as specified in the operator's manual;

(c) CRM

(1) Integration of CRM elements into the different phases of training by all the personnel conducting the training, as per AMC1 and AMC2 ORO.FC.115.

(2) The operator should ensure that all personnel conducting such training are suitably qualified to integrate elements of CRM into this training.

(3) Classroom CRM training by at least one CRM trainer, qualified as specified in AMC2 ORO.FC.146 who may be assisted by experts in order to address specific areas.

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

PERSONNEL PROVIDING AIRCRAFT/FSTD TRAINING AND CONDUCTING OPERATOR PROFICIENCY CHECKING AND QUALIFIED UNDER ANNEX I (PART-FCL) TO REGULATION (EU) No 1178/2011

Training and checking should be provided by the following personnel:

(a) Flight training by a type rating instructor (TRI) or class rating instructor (CRI), flight instructor (FI) or, in the case of the FSTD content, a synthetic flight instructor (SFI). For commercial air transport, the FI, TRI, CRI or SFI should satisfy the operator's experience and knowledge requirements sufficiently to instruct on aircraft systems and operational procedures and requirements.

(b) Operator proficiency check by a type rating examiner (TRE), class rating examiner (CRE) or, if the check is conducted in an FSTD, a synthetic flight examiner (SFE). The TRE, CRE or SFE should be trained in CRM concepts and the assessment of CRM skills.

(c) For aircraft/FSTD training, line flying under supervision, operator proficiency checks and line checks, if the training or checking includes multi-pilot operations in helicopters, in addition to (a) and (b) the personnel conducting training or checking should have 350 hours flying experience in multi-pilot operations.

(d) In the case of CAT operations in helicopters, the 350 hours flying experience in multi-pilot operations defined in (c) may be reduced on an individual basis, as part of the approval of the training and checking programmes. The operator may apply for such a reduced flying experience based on the unavailability of experienced pilots in both multi-pilot operations and in their types of operations. A FI/TRI/SFI rating and MCC training in helicopters should be a prerequisite for any reduced flying experience in multi-pilot operations. In addition, the operator should define mitigation measures after having performed a risk assessment. The following should be taken into account:

(1) flying experience criteria in single-pilot operations in the types of operations;

(2) any other training, checking, recency and experience criteria;

(3) robustness and maturity of multi-pilot SOPs.

(e) In the case of training and checking towards the relevant aspects associated with a specialised operation, points (j)(2) to (j)(4) of AMC1 ORO.FC.146(e);(f)&(g) should apply.

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.

(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 EBT 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.

AMC1 ORO.FC.146(e);(f)&(g) Personnel providing training, checking and assessment

SUITABLY QUALIFIED PIC OR COMMANDER NOMINATED BY THE OPERATOR — GENERAL

(a) The nominated PIC/commander conducting training should either be qualified as an instructor under BAR 1 Part FCL or receive training which should cover at least:
  (1) techniques of briefing and debriefing;
  (2) CRM concepts and CRM assessment;
  (3) for SPO, which manoeuvres the nominated PIC/commander should not train or check unless qualified as an instructor.
(b) In addition, the nominated PIC/commander conducting operator proficiency checks or line checks should either be qualified as an examiner under BAR 1 Part FCL or receive additional training which should cover at least:
  (1) how to perform a check;
  (2) flight techniques applicable to checks performed in flight;
  (3) the assessment of CRM skills.
(c) The nominated PIC/commander conducting aircraft/FSTD training, line flying under supervision, operator proficiency checks or line checks taking place under multi-pilot operations in helicopters should have 350 hours flying experience in multi-pilot operations.
(d) The nominated PICs/commanders, or the criteria for nominating PICs/commanders, should be included in the operations manual.
(e) The nominated PIC/commander should be type rated or class rated in the type or class where he or she provides the training, checking or assessment.

CAT — SUITABLY QUALIFIED COMMANDER OR INSTRUCTOR NOMINATED BY THE OPERATOR

(f) For CAT operations under VFR by day, the minimum experience of the nominated commander should be more than 750 hours total flight time with at least 50 hours on the type, class or the aircraft variant.
(g) For CAT operations in performance class B aeroplanes under night VFR or under IFR, the minimum experience of the nominated commander should be more than 1 000 hours total flight time with at least 100 hours on the type, class or the aircraft variant.
(h) In the case of CAT operations in helicopters, the 350 hours flying experience in multi-pilot operations defined in (c) may be reduced on an individual basis, as part of the approval of the training and checking programmes. The operator may apply for such a reduced flying experience based on the unavailability of experienced pilots in both multi-pilot operations and in their types of operations. An FI/TRI/SFI rating and MCC training in helicopters should be a prerequisite for any reduced flying experience in multi-pilot operations. In addition, the operator should define mitigation measures after having performed a risk assessment. The following should be taken into account:
  (1) flying experience criteria in single-pilot operations in the types of operations;
  (2) any other training, checking, recency and experience criteria; and
  (3) robustness and maturity of multi-pilot SOPs.
(i) ORO.FC.220 (f) allows the operator to develop a specific conversion course to address an operational circumstance, when the operator intends to have pilots temporally joining the operator to conduct line checks. The content of the specific operator's conversion course is included in AMC1 ORO.FC.220(f).

SPO — SUITABLY QUALIFIED PIC OR INSTRUCTOR NOMINATED BY THE OPERATOR

(j) For SPO, the person conducting the aircraft/FSTD training and the operator proficiency check should meet the following criteria:
  (1) Training and checking covering normal, abnormal and emergency procedures relevant to the type or variant should be conducted in accordance with AMC1 ORO.FC.146(b).
  (2) Training and checking covering the relevant aspects associated with HEC and HESLO should be conducted by a HEC or HESLO instructor as defined in AMC1 SPO.SPEC.HEC.100 and AMC1 SPO.SPEC.HESLO.100.
  (3) Training and checking covering the relevant aspects associated with a specialised operation other than HEC and HESLO should be conducted by a nominated PIC with the following flight experience:
    (i) at least 750 hours total flight time with at least 50 hours on the type, class or aircraft variant;
    (ii) for specialised operations other than HEC and HESLO, either:
      (A) at least 350 hours in the applicable specialised operation; or
      (B) 800 hours in specialised operations and the number of hours in the applicable specialised operation as defined by the operator, based on a risk assessment, taking into account the complexity of the relevant aspects associated with the applicable specialised operation. Flight experience in HHO, firefighting flight experience and flight experience in the search component of search and rescue flights may be credited

towards the 800 hours in specialised operations. In addition, up to 200 hours of experience in CAT operations (other than HHO) may be credited towards the 800 hours in specialised operations.

(4) In addition to (2) and (3) above, flight training and checking of sensitive type-related manoeuvres in combination with the training and checking of the relevant aspects associated with a specialised task, should be conducted by a qualified instructor.

(k) In addition to (j) above, if the SPO operator combines the operator proficiency check with a licence proficiency check, the person conducting the check should meet the requirements for licence proficiency checks.

Section 2 - Additional requirements for Commercial Air Transport operations

AMC1 ORO.FC.200(a) Composition of flight crew

CREWING OF INEXPERIENCED FLIGHT CREW MEMBERS

The operator should establish procedures in the operations manual taking into account the following elements:

AEROPLANES

(a) The operator should consider that a flight crew member is inexperienced, following completion of a type rating or command course, and the associated line flying under supervision, until he/she has achieved on the type either:

  (1) 100 flight hours and flown 10 sectors within a consolidation period of 120 consecutive days; or

  (2) 150 flight hours and flown 20 sectors (no time limit).

(b) A lesser number of flight hours or sectors, subject to any other conditions that the Brunei DCA may impose, may be acceptable to the Brunei DCA when one of the following applies:

  (1) a new operator is commencing operations;

  (2) an operator introduces a new aeroplane type;

  (3) flight crew members have previously completed a type conversion course with the same operator;

  (4) credits are defined in the operational suitability data in accordance with Part 21;

  (5) the aeroplane has a maximum take-off mass of less than 10 tonnes or a maximum operational passenger seating configuration (MOPSC) of less than 20.

HELICOPTERS

(c) The operator should consider that, when two flight crew members are required, a flight crew member, following completion of a type rating or command course, and the associated line flying under supervision, is inexperienced until either:

  (1) he/she has achieved 50 flight hours on the type and/or in the role within a period of 60 days; or

  (2) he/she has achieved 100 flight hours on the type and/or in the role (no time limit).

(d) A lesser number of flight hours, on the type and/or in the role, and subject to any other conditions which the Brunei DCA may impose, may be acceptable to the Brunei DCA when one of the following applies:

  (1) a new operator is commencing operations;

  (2) an operator introduces a new helicopter type;

  (3) flight crew members have previously completed a type conversion course with the same operator (reconversion); or

  (4) credits are defined in the operational suitability data in accordance with Part 21.

AMC1 ORO.FC.205 Command course

COMBINED UPGRADING AND CONVERSION COURSE — HELICOPTER

If a pilot is converting from one helicopter type to another when upgrading to commander:

(a) the command course should also include a conversion course in accordance with ORO.FC.220; and

(b) additional flight sectors should be required for a pilot transitioning onto a new type of helicopter.

AMC1 ORO.FC.215 Initial operator's crew resource management (CRM) training

TRAINING ELEMENTS AND TRAINER QUALIFICATION

Initial operator's CRM training should:

(a) cover the applicable provisions of AMC1 ORO.FC.115, including the training elements as specified in Table 1 thereof; and

(b) be conducted by a flight crew CRM trainer who is qualified as specified in AMC2 ORO.FC.146.

AMC1 ORO.FC.220 Operator conversion training and checking

OPERATOR CONVERSION TRAINING SYLLABUS

(a) General

(1) The operator conversion training should include, in the following order:

(i) ground training and checking, including all of the following:

(A) aircraft systems;

(B) normal procedures, which include flight planning and ground-handling and flight operations, including performance, mass and balance, fuel schemes, selection of alternates, and ground de-icing/anti-icing;

(C) abnormal and emergency procedures, which include pilot incapacitation as applicable;

(D) a review of relevant samples of accident/incident and occurrences to increase awareness of the occurrences that may be relevant for the intended operation;

(ii) emergency and safety equipment training and checking, (completed before any flight training in an aircraft commences);

(iii) flight training and checking (aircraft and/or FSTD); and

(iv) line flying under supervision and line check.

(2) When the flight crew member has not previously completed an operator’s conversion course, he/she should undergo general first-aid training and, if applicable, ditching procedures training using the equipment in water.

(3) Where the emergency drills require action by the non-handling pilot, the check should additionally cover knowledge of these drills.

(4) The operator’s conversion may be combined with a new type/class rating training, as required by Part FCL.

(5) The operator should ensure that:

(i) applicable elements of CRM training, as specified in Table 1 of AMC1 ORO.FC.115, are integrated into all appropriate phases of the conversion training; and

(ii) the personnel integrating elements of CRM into conversion training are suitably qualified, as specified in AMC2 ORO.FC.146.

(b) Ground training

(1) Ground training should comprise a properly organised programme of ground instruction supervised by training staff with adequate facilities, including any necessary audio, mechanical and visual aids. Self-study using appropriate electronic learning aids, computer-based training (CBT), etc., may be used with adequate supervision of the standards achieved. However, if the aircraft concerned is relatively simple, unsupervised private study may be adequate if the operator provides suitable manuals and/or study notes.

(2) The course of ground instruction should incorporate formal tests.

(c) Emergency and safety equipment training and checking

(1) Emergency and safety equipment training should 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.

(2) On the initial conversion course and on subsequent conversion courses as applicable, the following should be addressed:

(i) Instruction on first-aid in general (initial conversion course only); instruction on first-aid as relevant to the aircraft type of operation and crew complement, including those situations where no cabin crew is required to be carried (initial and subsequent).

(ii) Aero-medical topics, including:

(A) hypoxia;

(B) hyperventilation;

(C) contamination of the skin/eyes by aviation fuel or hydraulic or other fluids;

(D) hygiene and food poisoning; and

(E) malaria.

(iii) The effect of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment.

(3) Operations where no cabin crew is required

(i) Passenger handling

Other than general training on dealing with people, emphasis should be placed on the following:

(A) advice on the recognition and management of passengers who appear or are intoxicated with alcohol, under the influence of drugs or aggressive;

(B) methods used to motivate passengers and the crowd control necessary to expedite an aircraft evacuation; and

(C) the importance of correct seat allocation with reference to aircraft mass and balance. Particular emphasis should also be given on the seating of special categories of passengers.

(ii) Discipline and responsibilities Emphasis should be placed on discipline and an individual's responsibilities in relation to:

(A) his or her ongoing competence and fitness to operate as a crew member with special regard to flight and duty time limitation (FTL) requirements; and

(B) security procedures.

(iii) Passenger briefing/safety demonstrations Training should be given in the preparation of passengers for normal and emergency situations.

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

(6) The operational procedures of security, rescue and emergency services.

(7) Survival information appropriate to their areas of operation (e.g. polar, desert, jungle or sea) and training in the use of any survival equipment required to be carried.

(i) A comprehensive drill to cover all ditching procedures where flotation equipment is carried. This should include practice of the actual donning and inflation of a life-jacket, together with a demonstration or audio- visual presentation of the inflation of life-rafts and/or slide-rafts and associated equipment. This practice should, on an initial conversion course, be conducted using the equipment in water, although previous certified training with another operator or the use of similar equipment will be accepted in lieu of further wet-drill training.

(ii) Instruction on the location of emergency and safety equipment, correct use of all appropriate drills, and procedures that could be required of flight crew in different emergency situations. Evacuation of the aircraft (or a representative training device) by use of a slide where fitted should be included when the operations manual procedure requires the early evacuation of flight crew to assist on the ground.

(d) Flight training

(1) Flight training should be conducted to familiarise the flight crew member thoroughly with all aspects of limitations and normal, abnormal and emergency procedures associated with the aircraft and should be carried out by suitably qualified class and type rating instructors and/or examiners. For specific operations, such as steep approaches, ETOPS, or operations based on QFE, additional training should be carried out, based on any additional elements of training defined for the aircraft type in the operational suitability data in accordance with Part 21, where they exist.

(2) In planning flight training on aircraft with a flight crew of two or more, particular emphasis should be placed on the practice of LOFT with emphasis on CRM, and the use of crew coordination procedures, including coping with incapacitation.

(3) Normally, the same training and practice in the flying of the aircraft should be given to co-pilots as well as commanders. The 'flight handling' sections of the syllabus for commanders and co-pilots alike should include all the requirements of the operator proficiency check required by ORO.FC.230.

(4) Unless the type rating training programme has been carried out in an FSTD usable for ZFTT, the training should include at least three take-offs and landings in the aircraft.

(e) Operator proficiency check

(1) For aeroplanes, the operator proficiency check that is part of the operator's conversion checking should follow the provisions in AMC1 ORO.FC.230. For EBT, the operator should include either an EBT module in accordance with ORO.FC.231 or an OPC in accordance with AMC1 ORO.FC.230.

(2) For helicopters, the operator proficiency check that is part of the operator's conversion checking should include at least the following emergency/abnormal procedures as relevant to the helicopter and operations:

(i) engine fire;

(ii) interior helicopter fire or smoke;

(iii) emergency operation of undercarriage;

(iv) hydraulic failure;

(v) electrical failure;

(vi) flight and engine control system malfunctions;

(vii) recovery from unusual attitudes;

(viii) landing with one or more engine(s) inoperative;

(ix) instrument meteorological conditions (IMC) autorotation techniques;

(x) autorotation to a designated area;

(xi) pilot incapacitation;

(xii) directional control failures and malfunctions; and

(xiii) engine failure and if relevant, relight; and for multi-engined helicopters:

(xiv) engine failure during take-off before decision point;

(xv) engine failure during take-off after decision point;

(xvi) engine failure during landing before decision point; and

(xvii)engine failure during landing after decision point.

(3) For helicopter pilots required to engage in IFR operations, the proficiency check should include the following additional normal/abnormal/emergency procedures:

(i) 3D approach operation to minima;

(ii) go-around on instruments;

(iii) 2D approach operation to minima;

(iv) if relevant, at least one of the 3D or 2D approach operations should be an RNP APCH or RNP AR APCH operation;

(v) in the case of multi-engined helicopters, a simulated failure of one engine to be included in either the 3D or 2D approach operation to minima; and

(vi) where appropriate to the helicopter type, approach with flight control system/flight director system malfunctions, flight instrument and navigation equipment failures.

(4) For helicopters, the flight crew should be assessed on their CRM skills in accordance with the methodology described in AMC1 ORO.FC.115 and as specified in the operations manual.

(5) The use of FSTDs, composition of the flight crew, and the possible combinations with training or with the licence proficiency check should be defined as per AMC1 ORO.FC.230.

(i) Line flying under supervision (LIFUS)

(1) Following completion of flight training and checking as part of the operator's conversion course, each flight crew member should operate a minimum number of sectors and/or flight hours under the supervision of a flight crew member nominated by the operator.

(2) The minimum flight sectors/hours should be specified in the operations manual and should be determined by the following:

(i) previous experience of the flight crew member;

(ii) complexity of the aircraft; and

(iii) the type and area of operation.

(3) For performance class B aeroplanes, the amount of LIFUS required is dependent on the complexity of the operations to be performed.

Training should be given in the preparation of passengers for normal and emergency situations.

AMC3 ORO.FC.220 Operator conversion training and checking

TRAINING PROGRAMMES

The operator should ensure that training programmes include the relevant de-identified feedback from the management system, including occurrence reporting and flight data monitoring programmes.

AMC1 ORO.FC.220(b) Operator conversion training and checking

ASSIGNMENT TO FLIGHTS DURING AN OPERATOR CONVERSION COURSE — HELICOPTERS

(a) A group of helicopter types should include either only single-engined turbine helicopters operated only under VFR or only single-engined piston helicopters operated only under VFR.

(b) The flight crew member should only be assigned to flights on a helicopter within the same group of helicopter types as the type used for the operator conversion training and checking.

(c) Once an operator conversion course has been commenced, the flight crew member should not start another operator conversion course on another helicopter type until that course is completed or terminated.

AMC1 ORO.FC.220(f) Operator conversion training and checking

SPECIFIC CONVERSION COURSE — SUITABLY QUALIFIED COMMANDER NOMINATED BY THE OPERATOR — PILOTS WHO TEMPORARILY JOIN THE OPERATOR AND WILL BE NOMINATED TO CONDUCT LINE CHECKS

(a) In some cases, operational circumstances may require the operator to develop a specific conversion course to nominate pilots as suitably qualified commanders to conduct line checks in accordance with the requirements of ORO.FC.146. In this case, the operator conversion training should include training as follows:

(1) normal procedures, which include flight planning and ground-handling and flight operations, including performance, mass and balance, fuel schemes, selection of alternates, and ground de-icing/anti-icing;

(2) abnormal and emergency procedures, which include pilot incapacitation as applicable.

(b) The operator should ensure that the line checker is familiar with:

(1) the operating procedures and the use of checklists used by the operator;

(2) the emergency and safety equipment installed or carried on the operated aircraft.

(c) After the completion of the specific conversion course, the following apply:

(1) The line checker should not exercise duties at the controls of the aircraft.

(2) The line checker should only conduct recurrent line checks of pilots whose previous line check has not expired, in accordance with ORO.FC.230.

(d) The validity of the specific conversion course should be limited to 6 months.

GM1 ORO.FC.220(f) Operator conversion training and checking

SPECIF CONVERSION COURSE TO BE USE TEMPORARILY FOR A LIMITED NUMBER OF PILOTS — NEW AOC OR ADDITION OF A NEW AIRCRAFT TYPE OR CLASS TO THE FLEET

For a new AOC or for the addition of a new aircraft type or class to the fleet, the operator may contact the competent authority to agree on a specific conversion course to be included in the operations manual (CAT requires approval in accordance with ORO.FC.145 point (c)) to be used temporarily for a limited number of pilots. The specific course may include an agreement on the minimum experience of the pilots, the required experience of the line supervisor and line checkers amongst others.

AMC1 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

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

(a) Upset prevention training should:

(1) consist of ground training and flight training in an FSTD or an aeroplane;

(2) include upset prevention elements from Table 1 for the conversion training course; and

(3) include upset prevention elements in Table 1 for the recurrent training programme at least every 12 calendar months, such that all the elements are covered over a period not exceeding 3 years.

Table 1: Elements and respective components of upset prevention training

Elements and components		Ground training	FSTD/ Aeroplane training
A.	Aerodynamics		
1.	General aerodynamic characteristics	•	
2.	Aeroplane certification and limitations	•	
3.	Aerodynamics (high and low altitudes)	•	•
4.	Aeroplane performance (high and low altitudes)	•	•
5.	Angle of attack (AOA) and stall awareness	•	•
6.	Stick shaker or other stall-warning device activation (as applicable)	•	•
7.	Stick pusher (as applicable)	•	•
8.	Mach effects (if applicable to the aeroplane type)	•	•
9.	Aeroplane stability	•	•
10.	Control surface fundamentals	•	•
11.	Use of trims	•	•
12.	Icing and contamination effects	•	•
13.	Propeller slipstream (as applicable)	•	•
B.	Causes of and contributing factors to upsets		
1.	Environmental	•	
2.	Pilot-induced	•	
3.	Mechanical (aeroplane systems)	•	
C.	Safety review of accidents and incidents relating to aeroplane upsets		
1.	Safety review of accidents and incidents relating to aeroplane upsets	•	
D.	g-load awareness and management		

Elements and components		**Ground training**	**FSTD/ Aeroplane training**
1.	Positive/negative/increasing/decreasing g-loads	•	•
2.	Lateral g awareness (sideslip)	•	•
3.	g-load management	•	•
E.	Energy management		
1.	Kinetic energy vs. potential energy vs. chemical energy (power)	•	•

F.	Flight path management		
1.	Relationship between pitch, power and performance	•	•
2.	Performance and effects of differing power plants (if applicable)	•	•
3.	Manual and automation inputs for guidance and control	•	•
4.	Type-specific characteristics	•	•
5.	Management of go-arounds from various stages during the approach	•	•
6.	Automation management	•	•
7.	Proper use of rudder	•	•
G.	Recognition		
1.	Type-specific examples of physiological, visual and instrument clues during developing and developed upsets	•	•
2.	Pitch/power/roll/yaw	•	•
3.	Effective scanning (effective monitoring)	•	•
4.	Type-specific stall protection systems and cues	•	•
5.	Criteria for identifying stalls and upsets	•	•
H.	System malfunction		
1.	Flight control defects	•	•
2.	Engine failure (partial or full)	•	•
3.	Instrument failures	•	•
4.	Loss of reliable airspeed	•	•
5.	Automation failures	•	•
6.	Fly-by-wire protection degradations	•	•
7.	Stall protection system failures including icing alerting systems	•	•
I.	Manual handling skills		
1.	Flight at different speeds, including slow flight, and altitudes within the full normal flight envelope		•
2.	Procedural instrument flying and manoeuvring including instrument departure and arrival		•
3.	Visual approach		•
4.	Go-arounds from various stages during the approach	•	•
5.	Steep turns		•

(b) Upset recovery training should:

(1) consist of ground training and flight training in an FFS qualified for the training task;

(2) be completed from each seat in which a pilot's duties require him/her to operate; and

(3) include the recovery exercises in Table 2 for the recurrent training programme, such that all the exercises are covered over a period not exceeding 3 years.

Table 2: Exercises for upset recovery training

Exercises		**Ground training**	**FFS training**
A.	Recovery from developed upsets		
1.	Timely and appropriate intervention	•	•
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.	•	•
3.	Recovery from nose high at various bank angles	•	•
4.	Recovery from nose low at various bank angles	•	•
5.	Consolidated summary of aeroplane recovery techniques	•	•

(c) The operator should ensure that personnel providing FSTD UPRT are competent and current to deliver the training, and understand the capabilities and limitations of the device used.

(d) An FFS that is used for the training referred to in point (b)(1) should be qualified in accordance with the special evaluation requirements set out in CS-FSTD(A) (Issue 2 or later).

AMC2 ORO.FC.220 Operator conversion training and checking

OPERATOR CONVERSION TRAINING SYLLABUS — FLIGHT ENGINEERS

(a) Operator conversion training for flight engineers should approximate to that of pilots.

(b) If the flight crew includes a pilot with the duties of a flight engineer, he/she should, after training and the initial check in these duties, operate a minimum number of flight sectors under the supervision of a nominated additional flight crew member. The minimum figures should be specified in the operations manual and should be selected after due note has been taken of the complexity of the aircraft and the experience of the flight crew member.

AMC2 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

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

(a) Upset prevention training should:

(1) consist of ground training and flight training in an FSTD or an aeroplane;

(2) include upset prevention elements in Table 1 of AMC1 ORO.FC.220&230 for the conversion training course; and

(3) include upset prevention elements in Table 1 of AMC1 ORO.FC.220&230 for the recurrent training programme at least every 12 calendar months, such that all the elements are covered over a period not exceeding 3 years.

(b) Upset recovery training should:

(1) consist of ground training and flight training in an FFS qualified for the training task, if available;

(2) be completed from each seat in which a pilot's duties require him/her to operate; and

(3) 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.

(c) The operator should ensure that personnel providing FSTD UPRT are competent and current to deliver the training, and understand the capabilities and limitations of the device used.

(d) An FFS that is used for the training referred to in point (b)(1) should be qualified in accordance with the special evaluation requirements set out in CS-FSTD(A) (Issue 2 or later).

GM1 ORO.FC.220(c) Operator conversion training and checking

OPERATOR CONVERSION COURSE (OCC) FOR MULTI-CREW PILOT LICENCE (MPL) HOLDERS

When defining the amount of training for MPL holders, who undertake their first conversion course on a new type or at an operator other than the one that was involved in their training for the MPL, the operator should put a process in place to ensure that corrective action can be taken if post-MPL licence training evaluation indicates the need to do so.

GM1 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

UPSET PREVENTION AND RECOVERY TRAINING (UPRT) FOR COMPLEX MOTOR-POWERED AEROPLANES

The objective of the UPRT is to help flight crew acquire the required competencies in order to prevent or recover from a developing or developed aeroplane upset. Prevention training prepares flight crew to avoid incidents whereas recovery training prepares flight crew to prevent an accident once an upset condition has developed.

HUMAN FACTORS

Threat and Error Management (TEM) and Crew Resource Management (CRM) principles should be integrated into the UPRT. In particular, the surprise and startle effect, and the importance of resilience development should be emphasised.

Training should also emphasise that an actual upset condition may expose flight crew to significant physiological and psychological challenges, such as visual illusions, spatial disorientation and unusual g-forces, with the objective to develop strategies to deal with such challenges.

USE OF FSTD FOR UPRT

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

(1) the training environment;

(2) the capabilities of the instructors; and

(3) in the case of training in FSTDs, the limitations of the FSTD (as Part DEF for the FSTD training envelope); and

(4) in the case of training in aeroplanes, the capabilities and certification of the aeroplane, while considering a margin of safety in order to ensure that unintentional deviations from the training envelope will not exceed aeroplane limitations. Different training envelopes may be specified for different aeroplane types even within a single training course.

ADDITIONAL GUIDANCE

Specific guidance to the UPRT elements and exercises contained in the AMC is available from the latest revision of the ICAO Document 10011 ('Manual on UPRT').

Further guidance is available in:

— Revision 2 (as regards training scenarios for UPRT) and Revision 3 of the Aeroplane Upset Recovery Training Aid (AURTA (Revision 2) / AUPRTA (Revision 3)); and

— the Flight Safety Foundation Publication ('A Practical Guide for Improving Flight Path Monitoring'), November 2014.

GM2 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

UPSET PREVENTION TRAINING FOR COMPLEX MOTOR-POWERED AEROPLANES

The recurrent training should prioritise the upset prevention elements and respective components according to the operator's safety risk assessment.

Upset prevention training should use a combination of manoeuvre-based and scenario-based training. Scenario-based training may be used to introduce flight crew to situations which, if not correctly managed, could lead to an upset condition.

Relevant TEM and CRM aspects should be included in scenario-based training and the flight crew should understand the limitations of the FSTD in replicating the physiological and psychological aspects of exposure to upset prevention scenarios.

In order to avoid negative training and negative transfer of training, operators should ensure that the selected upset prevention scenarios and exercises take into consideration the limitations of the FSTD and the extent to which it represents the handling characteristics of the actual aeroplane. If it is determined that the FSTD is not suitable, the operator should ensure that the required training outcome can be achieved by other means.

GO-AROUNDS FROM VARIOUS STAGES DURING THE APPROACH

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

GM3 ORO.FC.220&230 Operator conversion training and checking & Recurrent training and checking

UPSET RECOVERY TRAINING FOR COMPLEX MOTOR-POWERED AEROPLANES

The upset recovery training exercises should be manoeuvre-based, which enables flight crew to apply their handling skills and recovery strategy whilst leveraging CRM principles to return the aeroplane from an upset condition to a stabilised flight path.

The flight crew should understand the limitations of the FFS in replicating the physiological and psychological aspects of upset recovery exercises.

In order to avoid negative training and negative transfer of training, operators should ensure that the selected upset recovery exercises take into consideration the limitations of the FFS.

STALL EVENT RECOVERY TRAINING

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

Stall event recovery training should emphasise the requirement to reduce the angle of attack (AOA) whilst accepting the resulting altitude loss. High-altitude stall event training should be included so that flight crew appreciate the aeroplane control response, the significant altitude loss during the recovery, and the increased time required. The training should also emphasise the risk of triggering a secondary stall event during the recovery.

Recovery from a stall event should always be in accordance with the stall event recovery procedures of the OEMs. If an OEM-approved recovery procedure does not exist, operators should develop and train the aeroplane-specific stall recovery procedure based on the template in Table 1 below.

Refer to Revision 3 of the Airplane Upset Prevention and Recovery Training Aid (AUPRTA) for a detailed explanation and rationale on the stall event recovery template as recommended by the OEMs.

Table 1: Recommended Stall Event Recovery Template

<table>
<tr><th colspan="3">Stall Event Recovery Template</th></tr>
<tr><td colspan="3">Pilot Flying - Immediately do the following at first indication of a stall (aerodynamic buffeting, reduced roll stability and aileron effectiveness, visual or aural cues and warnings, reduced elevator (pitch) authority, inability to maintain altitude or arrest rate of descent, stick shaker activation (if installed).) – during any flight phases except at lift-off.</td></tr>
<tr><td colspan="2">Pilot Flying (PF)</td><td>Pilot Monitoring (PM)</td></tr>
<tr><td>1.</td><td>AUTOPILOT – DISCONNECT
(A large out-of-trim condition could be encountered when the autopilot is disconnected.)</td><td>MONITOR airspeed and attitude throughout the recovery and ANNOUNCE any continued divergence</td></tr>
</table>

2.	**AUTOTHRUST/AUTOTHROTTLE** – OFF	
3.	**a) NOSE DOWN PITCH CONTROL** apply until stall warning is eliminated **b) NOSE DOWN PITCH TRIM** (as needed) (Reduce the angle of attack (AOA) whilst accepting the resulting altitude loss.)	
4.	**BANK – WINGS LEVEL**	
5.	**THRUST – ADJUST** (as needed) (Thrust reduction for aeroplanes with underwing mounted engines may be needed)	
6.	**SPEEDBRAKES/SPOILERS - RETRACT**	
7.	When airspeed is sufficiently increasing - **RECOVER** to level flight (Avoid the secondary stall due premature recovery or excessive g-loading.)	

NOSE HIGH AND NOSE LOW RECOVERY TRAINING

Nose-high and nose-low recovery training should be in accordance with the strategies recommended by the OEMs contained in the Tables 2 and 3 below. As the OEM procedures always take precedence over the recommendations, operators should consult their OEM on whether any approved type specific recovery procedures are available prior to using the templates.

Refer to revision 2 of the AURTA for a detailed explanation and rationale on the nose high and nose low recovery strategies as recommended by the OEMs.

Table 2: Recommended Nose High Recovery Strategy Template

Nose HIGH Recovery Strategy		
Either pilot - Recognise and confirm the developing situation by announcing: 'Nose High'		
PF		**PM**
1.	**AUTOPILOT – DISCONNECT** (A large out of trim condition could be encountered when the AP is disconnected.)	**MONITOR** airspeed and attitude throughout the recovery and **ANNOUNCE** any continued divergence
2.	**AUTOTHRUST/AUTOTHROTTLE – OFF**	
3.	**APPLY** as much nose-down control input as required to obtain a nose-down pitch rate	
4.	**THRUST – ADJUST** (if required) (Thrust reduction for aeroplanes with underwing mounted engines may be needed.)	

5.	**ROLL – ADJUST** (if required) (Avoid exceeding 60 degrees bank.)	
6.	When airspeed is sufficiently increasing - **RECOVER** to level flight (Avoid the secondary stall due premature recovery or excessive g-loading.)	
NOTE: 1) Recovery to level flight may require use of pitch trim. 2) If necessary, consider reducing thrust in aeroplanes with underwing-mounted engines to aid in achieving nose- down pitch rate. 3) **WARNING:** Excessive use of pitch trim or rudder may aggravate the upset situation or may result in high structural loads.		

Table 3: Recommended Nose Low Recovery Strategy Template

Nose LOW Recovery Strategy Template		
Either pilot - Recognise and confirm the developing situation by announcing: ‘Nose Low’ (If the autopilot or autothrust/autothrottle is responding correctly, it may not be appropriate to decrease the level of automation while assessing if the divergence is being stopped.)		
PF		**PM**
1.	**AUTOPILOT – DISCONNECT** (A large out of trim condition could be encountered when the AP is disconnected.)	**MONITOR** airspeed and attitude throughout the recovery and **ANNOUNCE** any continued divergence
2.	**AUTOTHRUST/AUTOTHROTTLE – OFF**	
3.	**RECOVERY** from stall if required	
4.	**ROLL** in the shortest direction to wings level. (It may be necessary to reduce the g-loading by applying forward control pressure to improve roll effectiveness)	
5.	**THRUST and DRAG – ADJUST** (if required)	
6.	**RECOVER** to level flight. (Avoid the secondary stall due premature recovery or excessive g-loading.)	
NOTE: 1) Recovery to level flight may require use of pitch trim. 2) WARNING: Excessive use of pitch trim or rudder may aggravate the upset situation or may result in high structural loads.		

GM5 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

PERSONNEL PROVIDING FSTD UPSET PREVENTION AND RECOVERY TRAINING (UPRT)

It is of paramount importance that personnel providing UPRT in FSTDs have the specific competence to deliver such training, which may not have been demonstrated during previous instructor qualification training. Operators should, therefore, have a comprehensive training and standardisation programme in place, and may need to provide FSTD instructors with additional training to ensure such instructors have and maintain complete knowledge and understanding of the UPRT operating environment, and skill sets.

Standardisation and training should ensure that personnel providing FSTD UPRT:

(1) are able to demonstrate the correct upset recovery techniques for the specific aeroplane type;

(2) understand the importance of applying type-specific Original Equipment Manufacturers (OEMs) procedures for recovery manoeuvres;

(3) are able to distinguish between the applicable SOPs and the OEMs recommendations (if available);

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

(5) are aware of the potential of negative transfer of training that may exist when training outside the capabilities of the FSTD;

(6) understand and are able to use the IOS of the FSTD in the context of effective UPRT delivery;

(7) understand and are able to use the FSTD instructor tools available for providing accurate feedback on flight crew performance;

(8) understand the importance of adhering to the FSTD UPRT scenarios that have been validated by the training programme developer; and

(9) understand the missing critical human factor aspects due to the limitations of the FSTD and convey this to the flight crew receiving the training.

GM1 ORO.FC.220(b) Operator conversion training and checking

COMPLETION OF AN OPERATOR'S CONVERSION COURSE

(a) The operator conversion course is deemed to have started when the flight training has begun. The theoretical element of the course may be undertaken ahead of the practical element.

(b) Under certain circumstances the course may have started and reached a stage where, for unforeseen reasons, it is not possible to complete it without a delay. In these circumstances, the operator may allow the pilot to revert to the original type.

(c) Before the resumption of the operator conversion course, the operator should evaluate how much of the course needs to be repeated before continuing with the remainder of the course.

GM1 ORO.FC.220(d) Operator conversion training and checking

LINE FLYING UNDER SUPERVISION

(a) Line flying under supervision provides the opportunity for a flight crew member to carry into practice the procedures and techniques he/she has been made familiar with during the ground and flight training of an operator conversion course. This is accomplished under the supervision of a flight crew member specifically nominated and trained for the task. At the end of line flying under supervision the respective crew member should be able to perform a safe and efficient flight conducted within the tasks of his/her crew member station.

(b) A variety of reasonable combinations may exist with respect to:

  (1) a flight crew member's previous experience;

  (2) the complexity of the aircraft concerned; and

  (3) the type of route/role/area operations.

(c) Aeroplanes

The following minimum figures for details to be flown under supervision are guidelines for operators to use when establishing their individual requirements:

  (1) turbo-jet aircraft

(i) co-pilot undertaking first operator conversion course:

(A) total accumulated 100 hours or minimum 40 flight sectors;

(ii) co-pilot upgrading to commander:

(A) minimum 20 flight sectors when converting to a new type;

(B) minimum 10 flight sectors when already qualified on the aeroplane type.

AMC1 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

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

(a) Upset prevention training should:

(1) consist of ground training and flight training in an FSTD or an aeroplane;

(2) include upset prevention elements from Table 1 for the conversion training course; and

(3) include upset prevention elements in Table 1 for the recurrent training programme at least every 12 calendar months, such that all the elements are covered over a period not exceeding 3 years.

Table 1: Elements and respective components of upset prevention training

Elements and components		Ground training	FSTD/ Aeroplane training
A.	Aerodynamics		
1.	General aerodynamic characteristics	•	
2.	Aeroplane certification and limitations	•	
3.	Aerodynamics (high and low altitudes)	•	•
4.	Aeroplane performance (high and low altitudes)	•	•
5.	Angle of attack (AOA) and stall awareness	•	•
6.	Stick shaker or other stall-warning device activation (as applicable)	•	•
7.	Stick pusher (as applicable)	•	•
8.	Mach effects (if applicable to the aeroplane type)	•	•
9.	Aeroplane stability	•	•
10.	Control surface fundamentals	•	•
11.	Use of trims	•	•
12.	Icing and contamination effects	•	•
13.	Propeller slipstream (as applicable)	•	•
B.	Causes of and contributing factors to upsets		
1.	Environmental	•	•
2.	Pilot-induced	•	•
3.	Mechanical (aeroplane systems)	•	•

Elements and components		Ground training	FSTD/ Aeroplane training
C.	Safety review of accidents and incidents relating to aeroplane upsets		
1.	Safety review of accidents and incidents relating to aeroplane upsets	●	●
D.	g-load awareness and management		
1.	Positive/negative/increasing/decreasing g-loads	●	●
2.	Lateral g awareness (sideslip)	●	●
3.	g-load management	●	●
E.	Energy management		
1.	Kinetic energy vs. potential energy vs. chemical energy (power)	●	●
F.	Flight path management		
1.	Relationship between pitch, power and performance	●	●
2.	Performance and effects of differing power plants (if applicable)	●	●
3.	Manual and automation inputs for guidance and control	●	●
4.	Type-specific characteristics	●	●
5.	Management of go-arounds from various stages during the approach	●	●
6.	Automation management	●	●
7.	Proper use of rudder	●	●
G.	Recognition		
1.	Type-specific examples of physiological, visual and instrument clues during developing and developed upsets	●	●
2.	Pitch/power/roll/yaw	●	●
3.	Effective scanning (effective monitoring)	●	●
4.	Type-specific stall protection systems and cues	●	●
5.	Criteria for identifying stalls and upsets	●	●
H.	System malfunction		
1.	Flight control defects	●	●
2.	Engine failure (partial or full)	●	●
3.	Instrument failures	●	●
4.	Loss of reliable airspeed	●	●

5.	Automation failures	•	•
6.	Fly-by-wire protection degradations	•	•
7.	Stall protection system failures including icing alerting systems	•	•
I.	Manual handling skills		
1.	Flight at different speeds, including slow flight, and altitudes within the full normal flight envelope		•
2.	Procedural instrument flying and manoeuvring including instrument departure and arrival		•
3.	Visual approach		•
4.	Go-arounds from various stages during the approach		•
5.	Steep turns		•

(b) Upset recovery training should:

(1) consist of ground training and flight training in an FFS qualified for the training task;

(2) be completed from each seat in which a pilot's duties require him/her to operate; and

(3) include the recovery exercises in Table 2 for the recurrent training programme, such that all the exercises are covered over a period not exceeding 3 years.

Table 2: Exercises for upset recovery training

Exercises		Ground training	FFS training
A.	Recovery from developed upsets		
1.	Timely and appropriate intervention	•	•
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.	•	•
3.	Recovery from nose high at various bank angles	•	•
4.	Recovery from nose low at various bank angles	•	•
5.	Consolidated summary of aeroplane recovery techniques	•	•

(c) The operator should ensure that personnel providing FSTD UPRT are competent and current to deliver the training, and understand the capabilities and limitations of the device used.

(d) An FFS that is used for the training referred to in point (b)(1) should be qualified in accordance with the special evaluation requirements set out in CS-FSTD(A) (Issue 2 or later).

AMC2 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

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

(a) Upset prevention training should:

(1) consist of ground training and flight training in an FSTD or an aeroplane;

(2) include upset prevention elements in Table 1 of AMC1 ORO.FC.220&230 for the conversion training course; and

(3) include upset prevention elements in Table 1 of AMC1 ORO.FC.220&230 for the recurrent training programme at least every 12 calendar months, such that all the elements are covered over a period not exceeding 3 years.

(b) Upset recovery training should:

(1) consist of ground training and flight training in an FFS qualified for the training task, if available;

(2) be completed from each seat in which a pilot's duties require him/her to operate; and

(3) 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.

(c) The operator should ensure that personnel providing FSTD UPRT are competent and current to deliver the training, and understand the capabilities and limitations of the device used.

(d) An FFS that is used for the training referred to in point (b)(1) should be qualified in accordance with the special evaluation requirements set out in CS-FSTD(A) (Issue 2 or later).

GM1 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

UPSET PREVENTION AND RECOVERY TRAINING (UPRT) FOR COMPLEX MOTOR-POWERED AEROPLANES

The objective of the UPRT is to help flight crew acquire the required competencies in order to prevent or recover from a developing or developed aeroplane upset. Prevention training prepares flight crew to avoid incidents whereas recovery training prepares flight crew to prevent an accident once an upset condition has developed.

HUMAN FACTORS

Threat and Error Management (TEM) and Crew Resource Management (CRM) principles should be integrated into the UPRT. In particular, the surprise and startle effect, and the importance of resilience development should be emphasised.

Training should also emphasise that an actual upset condition may expose flight crew to significant physiological and psychological challenges, such as visual illusions, spatial disorientation and unusual g-forces, with the objective to develop strategies to deal with such challenges.

USE OF FSTD FOR UPRT

The use of an FSTD provides valuable training without the risks associated with aeroplane training. In order to avoid 'negative transfer of training', the capabilities of the specific FSTD to be used should be considered when designing and delivering the training programme, especially when manoeuvre training could involve operation outside the normal flight envelope of the aeroplane, for example during aerodynamic stall. Type specific content contained in the training programme should be developed in consultation with the Original Equipment Manufacturers (OEMs). Some FSTDs may offer capabilities that could enhance the UPRT, such as Instructor Operating Station (IOS) features. Operators may consider the value of such features in support of their training objectives.

Additional guidance

Specific guidance to the UPRT elements and exercises contained in the AMC is available from the latest revision of the ICAO Document 10011 ('Manual on UPRT'). Further guidance is available from revision 2 of the aeroplane upset recovery training aid (AURTA), the UK CAA Paper 2013/02 ('Monitoring Matters'), and the Flight Safety Foundation Publication ('A Practical Guide for Improving Flight Path Monitoring'), November 2014.

GM2 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

UPSET PREVENTION TRAINING FOR COMPLEX MOTOR-POWERED AEROPLANES

The recurrent training should prioritise the upset prevention elements and respective components according to the operator's safety risk assessment.

Upset prevention training should use a combination of manoeuvre-based and scenario-based training. Scenario-based training may be used to introduce flight crew to situations which, if not correctly managed, could lead to an upset condition.

Relevant TEM and CRM aspects should be included in scenario-based training and the flight crew should understand the limitations of the FSTD in replicating the physiological and psychological aspects of exposure to upset prevention scenarios.

In order to avoid negative training and negative transfer of training, operators should ensure that the selected upset prevention scenarios and exercises take into consideration the limitations of the FSTD and the extent to which it represents the handling characteristics of the actual aeroplane. If it is determined that the FSTD is not suitable, the operator should ensure that the required training outcome can be achieved by other means.

GO-AROUNDS FROM VARIOUS STAGES DURING THE APPROACH

Operators should conduct the go-around exercises from various altitudes during the approach with all engines operating, taking into account the following considerations:

— Un-planned go-arounds expose the crew to the surprise and startle effect;

— Go-arounds with various aeroplane configurations and different weights; and

— Balked landings (between Decision Altitude and touchdown or after touchdown unless thrust reversers have been activated).

In addition to full thrust all engine go-arounds, operators should consider including exercises using the 'limited thrust' go-around procedure, when available. This procedure reduces the risk of the airframe structural limits being exceeded and reduces the risk of crew being exposed to somatogravic illusion and disorientation effects, thereby reducing the risk of aeroplane upsets further.

The go-around exercises should always be performed in accordance with the OEM procedures and recommendations.

GM3 ORO.FC.220&230 Operator conversion training and checking & Recurrent training and checking

UPSET RECOVERY TRAINING FOR COMPLEX MOTOR-POWERED AEROPLANES

The upset recovery training exercises should be manoeuvre-based, which enables flight crew to apply their handling skills and recovery strategy whilst leveraging CRM principles to return the aeroplane from an upset condition to a stabilised flight path.

The flight crew should understand the limitations of the FFS in replicating the physiological and psychological aspects of upset recovery exercises.

In order to avoid negative training and negative transfer of training, operators should ensure that the selected upset recovery exercises take into consideration the limitations of the FFS.

STALL EVENT RECOVERY TRAINING

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

Stall event recovery training should emphasise the requirement to reduce the angle of attack (AOA) whilst accepting the resulting altitude loss. High-altitude stall event training should be included so that flight crew appreciate the aeroplane control response, the significant altitude loss during the recovery, and the increased time required. The training should also emphasise the risk of triggering a secondary stall event during the recovery.

Recovery from a stall event should always be in accordance with the stall event recovery procedures of the OEMs. If an OEM-approved recovery procedure does not exist, operators should develop and train the aeroplane-specific stall recovery procedure based on the template in Table 1 below.

Refer to revision 2 of the AURTA for a detailed explanation and rationale on the stall event recovery template as recommended by the OEMs.

Table 1: Recommended Stall Event Recovery Template

Stall Event Recovery Template		
Pilot Flying - Immediately do the following at first indication of a stall (aerodynamic buffeting, reduced roll stability and aileron effectiveness, visual or aural cues and warnings, reduced elevator (pitch) authority, inability to maintain altitude or arrest rate of descent, stick shaker activation (if installed).) – during any flight phases *except at lift-off*.		
Pilot Flying (PF)		**Pilot Monitoring (PM)**
1.	**AUTOPILOT – DISCONNECT** (A large out-of-trim condition could be encountered when the autopilot is disconnected.)	**MONITOR** airspeed and attitude throughout the recovery and **ANNOUNCE** any continued divergence
2.	**AUTOTHRUST/AUTOTHROTTLE** – OFF	
3.	**a) NOSE DOWN PITCH CONTROL** apply until stall warning is eliminated **b) NOSE DOWN PITCH TRIM** (as needed) (Reduce the angle of attack (AOA) whilst accepting the resulting altitude loss.)	
4.	**BANK – WINGS LEVEL**	
5.	**THRUST – ADJUST** (as needed) (Thrust reduction for aeroplanes with underwing mounted engines may be needed)	
6.	**SPEEDBRAKES/SPOILERS - RETRACT**	
7.	When airspeed is sufficiently increasing - **RECOVER** to level flight (Avoid the secondary stall due premature recovery or excessive g-loading.)	

NOSE HIGH AND NOSE LOW RECOVERY TRAINING

Nose-high and nose-low recovery training should be in accordance with the strategies recommended by the OEMs contained in the Tables 2 and 3 below. As the OEM procedures always take precedence over the recommendations, operators should consult their OEM on whether any approved type specific recovery procedures are available prior to using the templates.

Refer to revision 2 of the AURTA for a detailed explanation and rationale on the nose high and nose low recovery strategies as recommended by the OEMs.

Table 2: Recommended Nose High Recovery Strategy Template

<table>
<tr><th colspan="3">Nose HIGH Recovery Strategy</th></tr>
<tr><td colspan="3">Either pilot - Recognise and confirm the developing situation by announcing: ‘Nose High’</td></tr>
<tr><th colspan="2">PF</th><th>PM</th></tr>
<tr><td>1.</td><td>AUTOPILOT – DISCONNECT
(A large out of trim condition could be encountered when the AP is disconnected.)</td><td rowspan="6">MONITOR airspeed and attitude throughout the recovery and ANNOUNCE any continued divergence</td></tr>
<tr><td>2.</td><td>AUTOTHRUST/AUTOTHROTTLE – OFF</td></tr>
<tr><td>3.</td><td>APPLY as much nose-down control input as required to obtain a nose-down pitch rate</td></tr>
<tr><td>4.</td><td>THRUST – ADJUST (if required)
(Thrust reduction for aeroplanes with underwing mounted engines may be needed.)</td></tr>
<tr><td>5.</td><td>ROLL – ADJUST (if required)
(Avoid exceeding 60 degrees bank.)</td></tr>
<tr><td>6.</td><td>When airspeed is sufficiently increasing - RECOVER to level flight
(Avoid the secondary stall due premature recovery or excessive g-loading.)</td></tr>
<tr><td colspan="3">NOTE:
1) Recovery to level flight may require use of pitch trim.
2) If necessary, consider reducing thrust in aeroplanes with underwing-mounted engines to aid in achieving nose- down pitch rate.
3) WARNING: Excessive use of pitch trim or rudder may aggravate the upset situation or may result in high structural loads.</td></tr>
</table>

Table 3: Recommended Nose Low Recovery Strategy Template

Nose LOW Recovery Strategy Template		
Either pilot - Recognise and confirm the developing situation by announcing: 'Nose Low' (If the autopilot or autothrust/autothrottle is responding correctly, it may not be appropriate to decrease the level of automation while assessing if the divergence is being stopped.)		
	PF	**PM**
1.	**AUTOPILOT – DISCONNECT** (A large out of trim condition could be encountered when the AP is disconnected.)	**MONITOR** airspeed and attitude throughout the recovery and **ANNOUNCE** any continued divergence
2.	**AUTOTHRUST/AUTOTHROTTLE – OFF**	
3.	**RECOVERY** from stall if required	
4.	**ROLL** in the shortest direction to wings level. (It may be necessary to reduce the g-loading by applying forward control pressure to improve roll effectiveness)	
5.	**THRUST and DRAG – ADJUST** (if required)	
6.	**RECOVER** to level flight. (Avoid the secondary stall due premature recovery or excessive g-loading.)	
NOTE: 1) Recovery to level flight may require use of pitch trim. 2) WARNING: Excessive use of pitch trim or rudder may aggravate the upset situation or may result in high structural loads.		

GM4 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

FFS QUALIFIED FOR THE UPSET RECOVERY TRAINING TASK

The FFS used for the upset recovery training should be qualified to ensure the training task objectives can be achieved and negative transfer of training is avoided.

A level C or D FFS is qualified for the upset recovery training task, such as the approach-to-stall exercises. Full aerodynamic stall or other exercises outside the validated training envelope (VTE) should not be conducted.

A level B FFS may become qualified for the upset recovery training task if equivalency to at least level C for the specific features needed for the task can be demonstrated in accordance with EASA CS-FSTD(A) Appendix 8 to AMC1 FSTD(A).300 General Technical Requirements for FSTD Qualification Levels, and associated FSTD validation tests (as amended).

FSTD operators may achieve such demonstration of equivalency through the conduct of a special evaluation by the Brunei DCA. Once the level B FFS is deemed to be qualified, the Brunei DCA should enter the additional capability on the certificate using the wording 'upset recovery training'. FSTD Operators are reminded that the individual FFS used must be approved for the training by the Brunei DCA in accordance with ORO.FC.145(c).

Equivalency to at least level C for the specific features needed for the training task may be demonstrated using the following guidance and list in Table 1 of minimum objective and subjective functional test.

General

- Refer to EASA Subpart C Aeroplane Flight Simulation Training Devices AMC1 FSTD(A).300(c)(1)(i) and (2)(ii) (as amended) for the scope of the qualification criteria;

- A six-degrees-of-freedom motion system should be provided; and

- The response to control inputs should not be greater than 150 ms more than that experienced on the aeroplane (see EASA Appendix 1 to CS-FSTD(A).300 General r.1 (as amended)).

Table 1: Minimum FSTD standards, validation tests, and functions and subjective tests

FSTD Standards (EASA references)
Appendix 1 to CS-FSTD(A).300 Flight Simulation Training Device Standards (Ref. CS-FSTD(A) pages 9 - 22)
1. General - q.1, r.1, s.1, t.1, w.1
2. Motion System - b.1(3)
3. Visual System - b.2
FSTD Validation Tests (EASA references)
AMC1 FSTD(A).300 Qualification Basis – Table of FSTD Validation Tests (Ref. CS-FSTD(A) pages 46 - 75)
1. Performance - Climb - c.(4)
2. Handling Qualities - Dynamic Control Checks - b.(1), b.(2), b.(3), b.(4), b.(5), b.(6)
3. Motion System - e.
4. Visual System - a.(1) or a.(2), b.(1)(a)
Functions and Subjective Tests (EASA references)
AMC1 FSTD(A).300 Qualification Basis – Functions and Subjective Tests (CS-FSTD(A) page 115)
p. Special Effects - Effects of Airframe and Engine Icing - (2)(a) (See Appendix 1 to CS FSTD(A).300 1.t.1.)

GM5 ORO.FC.220&230 Operator conversion training and checking & recurrent training and checking

PERSONNEL PROVIDING FSTD UPSET PREVENTION AND RECOVERY TRAINING (UPRT)

It is of paramount importance that personnel providing UPRT in FSTDs have the specific competence to deliver such training, which may not have been demonstrated during previous instructor qualification training. Operators should, therefore, have a comprehensive training and standardisation programme in place, and may need to provide FSTD instructors with additional training to ensure such instructors have and maintain complete knowledge and understanding of the UPRT operating environment, and skill sets.

Standardisation and training should ensure that personnel providing FSTD UPRT:

(1) are able to demonstrate the correct upset recovery techniques for the specific aeroplane type;

(2) understand the importance of applying type-specific Original Equipment Manufacturers (OEMs) procedures for recovery manoeuvres;

(3) are able to distinguish between the applicable SOPs and the OEMs recommendations (if available);

(4) understand the capabilities and limitations of the FSTD used for UPRT;

(5) are aware of the potential of negative transfer of training that may exist when training outside the capabilities of the FSTD;

(6) understand and are able to use the IOS of the FSTD in the context of effective UPRT delivery;

(7) understand and are able to use the FSTD instructor tools available for providing accurate feedback on flight crew performance;

(8) understand the importance of adhering to the FSTD UPRT scenarios that have been validated by the training programme developer; and

(9) understand the missing critical human factor aspects due to the limitations of the FSTD and convey this to the flight crew receiving the training.

AMC1 ORO.FC.230 Recurrent training and checking

RECURRENT TRAINING AND CHECKING SYLLABUS

(a) Recurrent training

Recurrent training should comprise the following:

(1) Ground training

(i) The ground training programme should include:

(A) aircraft systems;

(B) normal procedures, which include flight planning and ground-handling and flight operations, including performance, mass and balance, fuel schemes, selection of alternates, and ground de-icing/anti-icing;

(C) abnormal and emergency procedures, which include pilot incapacitation as applicable;

(D) a review of relevant samples of accident/incident and occurrences to increase awareness of the occurrences that may be relevant for the intended operation.

(ii) Knowledge of the ground training should be verified by a questionnaire or other suitable methods.

(2) Emergency and safety equipment training

(i) Emergency and safety equipment training may be combined with emergency and safety equipment checking and should be conducted in an aircraft or a suitable alternative training device.

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

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

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

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

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

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

(F) security procedures.

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

(A) actual operation of all types of exits;

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

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

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

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

(F) demonstration in the use of the life-rafts where fitted. In the case of helicopters involved in extended over water operations, demonstration and use of the life-rafts.

Helicopter water survival training

Where life-rafts are fitted for helicopter extended overwater operations (such as sea pilot transfer, offshore operations, regular, or scheduled, coast-to-coast overwater operations), a comprehensive wet drill to cover all ditching procedures should be practised by aircraft crew. This wet drill should include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or audio-visual presentation of the inflation of life-rafts. Crews should board the same (or similar) life-rafts from the water whilst wearing a life-jacket. Training should include the use of all survival equipment carried on board life-rafts and any additional survival equipment carried separately on board the aircraft;

– consideration should be given to the provision of further specialist training such as underwater escape training. Where operations are predominately conducted offshore, operators should conduct 3-yearly helicopter underwater escape training at an appropriate facility;

– wet practice drill should always be given in initial training unless the crew member concerned has received similar training provided by another operator;

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

(iv) 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.

(v) 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.

(vi) 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.

(3) CRM

Elements of CRM training, as specified in Table 1 of AMC1 ORO.FC.115, should be integrated into all appropriate phases of recurrent training.

(4) Aircraft/FSTD training

(i) General

(A) The aircraft/FSTD training programme should be established in a way that all major failures of aircraft systems and associated procedures will have been trained in the preceding 3-year period.

(B) When engine-out manoeuvres are carried out in an aircraft, the engine failure should be simulated.

(C) The recurrent aircraft/FSTD training of a single task or manoeuvre should be separate from, and should not take place at the same time as, an operator proficiency check of the item.

(ii) Helicopters

(A) If the operator is able to demonstrate, on the basis of a compliance and risk assessment, that alternating the use of an FSTD with the use of an aircraft for this training provides equivalent standards of training with safety levels similar to those achieved using an FSTD, the aircraft may be used (alternating with the use of an FSTD) for this training to the extent necessary.

(B) Where a suitable FSTD is available and accessible, it should be used to complete the following additional items:

– settling with power and vortex ring;

– loss of tail rotor effectiveness.

(5) For operations with other-than-complex motor-powered aeroplanes, all training and checking should be relevant to the type of operation and class of aeroplane on which the flight crew member operates with due account taken of any specialised equipment used.

(b) Recurrent checking

Recurrent checking should comprise the following:

(1) Operator proficiency checks

(i) Aeroplanes

Operator proficiency checks should take place as part of the normal crew complement and should include, where applicable, the following manoeuvres as pilot flying:

(A) rejected take-off when an FSTD is available to represent that specific aeroplane, otherwise touch drills only;

(B) take-off with engine failure between V_1 and V_2 (take-off safety speed) or, if carried out in an aeroplane, at a safe speed above V_2;

(C) 3D approach operation to minima with, in the case of multi- engined aeroplanes, one-engine-inoperative;

(D) 2D approach operation to minima;

(E) at least one of the 3D or 2D approach operations should be an RNP APCH or RNP AR APCH operation;

(F) missed approach on instruments from minima with, in the case of multi-engined aeroplanes, one-engine-inoperative;

(G) landing with one-engine-inoperative. For single-engined aeroplanes a practice forced landing is required.

(ii) Helicopters

(A) The aircraft/FSTD checking programme should be established in a way that all major failures of aircraft systems and associated procedures will have been checked in the preceding 3-year period.

The operator should define which failures are major for the purpose of the operator proficiency check based on a risk assessment, taking the following into account:

(a) cautions or warnings associated with the failure;

(b) the criticality of the situation or failure;

(c) the outcome of the procedure (land immediately or as soon as possible as opposed to land as soon as practical);

(d) when available, manufacturer documentation; and

(e) the list of abnormal/emergency procedures described in point (e)(1) of AMC1 ORO.FC.220. In addition, for single-engined helicopters, each operator proficiency check should include at least the following procedures:

(f) engine failure;

(g) directional control failures and malfunctions; and

(h) hydraulic failure as applicable.

(B) When a group of single-engine turbine or single-engine piston helicopter types is defined for the purpose of extending the validity of the operator proficiency check, all major system failures should nevertheless be checked on every type within a 3-year cycle unless credits related to the training, checking and recent experience requirements are defined in the operational suitability data established in accordance with BAR 8 for the relevant types or variants.

(C) For pilots required to engage in IFR operations, proficiency checks include the following additional normal/abnormal/emergency procedures:

- 3D approach operation to minima;
- go-around on instruments;
- 2D approach operation to minima;
- If relevant, at least one of the 3D or 2D approach operations should be an RNP APCH or RNP AR APCH operation;
- in the case of multi-engined helicopters, a simulated failure of one engine to be included in either the 3D or 2D approach operation to minima;
- where appropriate to the helicopter type, approach with flight control system/flight director system malfunctions, flight instrument and navigation equipment failures.

(D) Before a flight crew member without a valid instrument rating is allowed to operate in VMC at night, they should be required to undergo a proficiency check at night. Thereafter, each second proficiency check should be conducted at night.

(E) Operator proficiency checks should be conducted with two qualified pilots in multi-pilot operations, and one qualified pilot in single-pilot operations. A pilot flying both single-pilot and multi-pilot operations should be checked in multi-pilot conditions with the essential malfunctions or manoeuvres below being also checked in the single-pilot role:

(a) at least two abnormal or emergency manoeuvres relevant to the type based on a risk assessment;

(b) one instrument approach for IFR operations.

(F) The flight crew should be assessed on their CRM skills in accordance with the methodology described in AMC1 and AMC2 ORO.FC.115 and as specified in the operations manual.

(G) If the operator is able to demonstrate, on the basis of a compliance and risk assessment, that alternating the use of an FSTD with the use of an aircraft for this training provides equivalent standards of checking with safety levels similar to those achieved using an FSTD, the aircraft may be used (alternating with the use of an FSTD) for this checking to the extent necessary.

(iii) The checks prescribed in (b)(1) may be combined with the skill test or proficiency check for required for the issue, the revalidation or renewal of the ATPL aircraft type rating and with the skill test required for the issue of the ATPL licence.

(2) Emergency and safety equipment checks.

The items to be checked should be those for which training has been carried out in accordance with (a)(2).

(3) Line checks

(i) A line checks should establish the ability to perform satisfactorily a complete line operation, including pre-flight and post-flight procedures and use of the equipment provided, as specified in the operations manual. The route chosen should be such as to give adequate representation of the scope of a pilot’s normal operations. When weather conditions preclude a manual landing, an automatic landing is acceptable. The commander, or any pilot who may be required to relieve the commander, should also demonstrate their ability to ‘manage’ the operation and take appropriate command decisions.

(ii) The flight crew should be assessed on their CRM skills in accordance with the methodology described in AMC1 ORO.FC.115 and as specified in the operations manual.

(iii) CRM assessment alone should not be used as a reason for a failure of the line check, unless the observed behaviour could lead to an unacceptable reduction in safety margin.

(iv) When pilots are assigned duties as pilot flying and pilot monitoring, they should be checked in both functions.

(v) A line check should be conducted by a commander nominated by the operator. The operator should maintain a list of nominated commanders and inform the Brunei DCA about the persons nominated. The person conducting the line check should occupy an observer's seat where installed.

(A) For aeroplanes, in the case of long-haul operations where additional operating flight crew are carried, the person conducting the line check 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.

(B) If an observer's seat is not installed but a forward-facing passenger seat allows a good view and sound of the cockpit and the crew, this seat should be used as an observer's seat.

(C) If an observer's seat is not available and cannot be installed, the commander nominated by the operator should occupy a pilot seat to conduct the line check.

(vi) CRM assessment during the line check

(A) The CRM assessment taking place during the line check should be solely based on observations made during the initial briefing, cabin briefing, flight crew compartment briefing and those phases where the line checker occupies the observer's seat.

(B) If an observer's seat is not available and cannot be installed, then the operator should define the best way to assess CRM taking into account the CRM principles above.

(vii) Complementary CRM assessment

If a suitable FSTD is available and accessible for operator proficiency checks or FSTD training, then a CRM assessment should take place in a line-oriented flight scenario (LOFT or line-oriented section of the OPC) of an FSTD session. This assessment complements the CRM assessment taking place during the line check, but is not part of the line check.

(4) In the case of single-pilot operations, the recurrent checks referred to in (b)(1), (2) and (3) should be performed in the single-pilot role in an environment representative of the operation.

(c) Flight crew incapacitation training, except single-pilot operations

(1) Procedures should be established to train flight crew to recognise and handle flight crew incapacitation. This training should be conducted every year and can form part of other recurrent training. It should take the form of classroom instruction, discussion, audio-visual presentation or other similar means.

(2) If an FSTD is available for the type of aircraft operated, practical training on flight crew incapacitation should be carried out at intervals not exceeding 3 years.

(d) Use of FSTD

(1) Training and checking provide an opportunity to practise abnormal/emergency procedures that rarely arise in normal operations and should be part of a structured programme of recurrent training. This should be carried out in an FSTD when available and accessible.

(2) The line check should be performed in the aircraft. All other training and checking should be performed in an FSTD, or, if it is not reasonably practicable to gain access to such devices, in an aircraft of the same type or in the case of emergency and safety equipment training, in a representative training device. The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the aircraft type operated by the flight crew member.

(3) Because of the unacceptable risk when simulating emergencies such as engine failure, icing problems, certain types of engine(s) (e.g. during continued take-off or go-around, total hydraulic failure), or because of environmental considerations associated with some emergencies (e.g. fuel dumping) these emergencies should preferably be covered in an FSTD. If no FSTD is available, these emergencies may be covered in the aircraft using a safe airborne simulation, bearing in mind the effect of any subsequent failure, and the exercise must be preceded by a comprehensive briefing.

AMC2 ORO.FC.230 Recurrent training and checking

FLIGHT ENGINEERS

(a) The recurrent training and checking for flight engineers should meet the requirements for pilots and any additional specific duties, omitting those items that do not apply to flight engineers.

(b) Recurrent training and checking for flight engineers should, whenever possible, take place concurrently with a pilot undergoing recurrent training and checking.

(c) The line check should be conducted by a commander or by a flight engineer nominated by the operator, in accordance with national rules, if applicable.

AMC3 ORO.FC.230 Recurrent training and checking

TRAINING PROGRAMMES

The operator should ensure that training programmes include the relevant de-identified feedback from the management system, including occurrence reporting and flight data monitoring programmes.

GM1 ORO.FC.230 Recurrent training and checking

LINE CHECK AND PROFICIENCY TRAINING AND CHECKING

(a) Line checks, route and aerodrome knowledge and recent experience requirements are intended to ensure the crew member's ability to operate efficiently under normal conditions, whereas other checks and emergency and safety equipment training are primarily intended to prepare the crew member for abnormal/emergency procedures.

(b) The line check 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. Line checks are a test of a flight crew member's ability to perform a complete line operation, including pre-flight and post-flight procedures and use of the equipment provided, and an opportunity for an overall assessment of their ability to perform the duties required as specified in the operations manual. The line check is not intended to determine knowledge on any particular route.

(c) Proficiency training and checking

When an FSTD is used, the opportunity should be taken, where possible, to use LOFT.

MAJOR FAILURES — HELICOPTERS

(d) The list of major failures as defined by the operator in AMC1 ORO.FC.230 for the purpose of training may be more extensive than the list covered in the 3-yearly operator proficiency checking programme for the following reasons:

(1) It may happen that several training elements are covered by a single check; and

(2) Certain complex system malfunctions are best explored under recurrent training, where the trainee will derive more benefit and training to proficiency is also employed.

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 authorities, operators and approved training organisations on the recurrent assessment and training of pilots by establishing a new methodology for the development and conduct of a recurrent assessment and training programme, titled evidence-based training (EBT).

ICAO Doc 9995 and the EASA EBT manual are 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 in the context of the European regulatory framework.

In the current regulatory framework, it is possible to achieve mixed implementation. 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 licence proficiency check (LPC) and the operator proficiency check (OPC).

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

The EBT 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 or the EASA tables of applicable aeroplane/helicopter types by generation.

MIXED EBT PROGRAMME

The operator may undertake implementation of the baseline 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 mixed EBT programme provides operators with the flexibility to adapt programmes according their to specific risks.

The operator should contact the Brunei DCA in order for them to assess the application of the process described in ICAO Doc 9995 or the EBT manual.

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), contain(s) the guidance for the assessment and training of personnel involved in the conduct of EBT.

EQUIVALENCY OF MALFUNCTIONS (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. Equivalency of malfunctions may be used to guide the operator towards the implementation of a mixed EBT programme according to AMC1 ORO.FC.230(a)(4)(i)(A) and ORO.FC.145(d).

Conduct of licence and operator proficiency checks

The EASA EBT programme described in ORO.FC.231 and the ICAO EBT programme described in ICAO Doc 9995 contain modules with three phases: the EVAL, the MT, and the SBT. In order to comply with the regulatory framework, in the mixed EBT programme the LPC and OPC requirements are fulfilled by a combination of the EVAL and the manoeuvres validation phase, which replaces the MT described in the EASA EBT programme or ICAO Doc 9995. The manoeuvres validation phase is defined in Section 2 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 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 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 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.*

AEROPLANES	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.*
	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 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 line-oriented 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, 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 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 proficiency 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;
(g) instructors grade competencies based on observable behaviours (OBs);
(h) instructors grade the pilot using a defined methodology — observe, record, classify and assess/evaluate (ORCA) is recommended;
(i) instructors have completed the EBT instructor standardisation;
(j) instructors have sufficient concordance based on defined criteria (instructor concordance assurance programme);
(k) the analysis of the pilot's performance is used to determine competency-based training needs;
(l) there is a range of teaching styles during simulator training to accommodate trainee learning needs; and
(m) 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 co-pilot 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 co-pilots, 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.

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:

(a) First, the EVAL; and

(b) 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 (PartFCL) 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.
   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.

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)	Pro

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 data (e.g. abstract, 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) Observe performance (behaviours) during the simulator session.
(2) Record details of effective and ineffective performance (behaviours) observed during the simulator session (‘record’ in this context refers to instructors taking notes).
(3) Classify observations against the OBs and allocate the OBs to each competency (or competencies), using amongst others the facilitation technique.
(4) Assess 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				
Grading	TEM	Observable behaviours		
	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 for each competency 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 for each competency 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.
(d) A simple practice to classify the observations recorded during the simulator session is to classify the OB as positive, negative, neutral.

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 the overall assessment of the performance of each competency during the EVAL. Although it is not recommended, if the instructor performs an overall grade (additional to level 1), it should be at level 0 grading metric (competent or not).
  (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 ineffectively, 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 behavioursto 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)	Situ

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, 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 takeoff 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.	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					
			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 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. 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 & goaround (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 engineout 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 the application of the normal standard operating procedures.	▪ 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)
(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 postflight 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)															
M	Rejected take-off	B	Rejected take-off 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					
M	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					
M	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					
M			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					
M	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). However, if the EBT programme does not include the example scenario element 'emergency descent' in the training topic 'automation management', the emergency descent procedures should be completed and should not stop once the aircraft is stabilised in emergency descent configuration.	x		x	x					
M	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					
M	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					
M	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					
M						Initiation of a go-around from DA followed by visual circuit and landing	x		x	x					
M						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 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	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	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	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.	ACAS warning (resolution advisory), 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		
						ACAS warning (resolution advisory to level off) during climb or descent; for example, close to the cleared level when the capture mode has already been activated	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	selection, mishandled flight management system(s) and inappropriate autopilot usage.	Recognise mishandled auto flight system. Take appropriate action if necessary.	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									
			CRZ			Engine failure in cruise to onset of descent using automation									
			CRZ			Emergency descent									
			DES APP			Managing high-energy descent capturing descent path from above (correlation with unstable approach training)							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 (resolution advisory) immediately following a go-around, with a descent manoeuvre required. (The RA should be a command for descent when the aircraft is above 1 100 ft AGL.)		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	Manual aircraft control	A	CLB CR Z DE S AP P	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 CR Z DE S APP			Alternate flight control modes according to malfunction characteristics	x			x				x	X
			CLB CR			ACAS warning (resolution advisory) requires the pilot to descend or ATC calls for immediate descent (preferably during climb which requires a significant change in aircraft attitude).	x	x		x					

			Z DES APP												
						ACAS warning (resolution advisory) requires the pilot to climb or ATC calls for immediate climb (preferably during descent which requires a significant change in aircraft attitude).	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,	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	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	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	

	mismanaged aircraft state		LDG	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.	learning opportunities throughout the programme. Monitor flight path excursions. Detect errors and threats through proper cross-checking performance.	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	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	may be in the role of pilot flying or pilot monitoring.		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	For full details, see the malfunction equivalency methodology.		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 (includesperformance 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								
							Table2 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 CRZ			4.	Recovery from nose low at various bank angles	x			x			x	x	
			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								
			APP			Loss of communications during approach phase, including go-around	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	
E	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. Apply the appropriate procedure correctly. Maintain aircraft control. Manage consequences.	ACAS warning that requires crew intervention		x				x	x	x	
					Dilemma: Visual acquisition of conflicting traffic followed by an ACAS warning (resolution advisory) triggered by the same or other traffic. Even if the traffic is in sight, the pilot should follow the RA.	x		x	x					
					While in descent, ACAS warning (traffic advisory) of an aircraft below. The crew should not initiate an avoidance manoeuvre based on TA (except decreasing the rate of descent unless otherwise instructed by ATC, etc.). This example scenario can be done during climb with conflicting traffic above.	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 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	Rejected take-off 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). However, if the EBT programme does not include the example scenario element 'emergency descent' in the training topic 'automation management', the emergency descent procedures should be completed and should not stop once the aircraft is stabilised in emergency descent configuration.	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	Guidance material (GM) Example scenario elements	P	C	F	F	L	P	S	W	K
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)															
EVAL or M	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
	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
	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
	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)															
EVAL or 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					
	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	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		
						ACAS warning (resolution advisory to level off) during climb or descent; for example, close to the cleared level when the capture mode has already been activated.	x		x				x		
			TO			Late ATC clearance to an altitude below acceleration altitude									
			TO APP			Engine-out special terrain procedures									

			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	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			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		management of information: Have an awareness of the aircraft state in its environment; project and anticipate changes.	ACAS warning (resolution advisory) immediately following a go-around, with a descent manoeuvre required. (The RA should be a command for descent when the aircraft is above 1 100 ft AGL.)		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*								
					<u>Workload management:</u> 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	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			CLB CRZ DES APP		Demonstrate manual aircraft control skills with smoothness and accuracy as	Flight with unreliable airspeed, which may or may not be recoverable	x			x			x		X

	Manual aircraft control	A	CLB CRZ DES APP	Controls the flight path through manual control	appropriate to the situation. Detect deviations through instrument scanning. Maintain spare mental capacity during manual aircraft control.	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 warning (resolution advisory) requires the pilot to descend or ATC calls for immediate descent (preferably during climb which requires a significant change in aircraft attitude)	x	x		x					
						ACAS warning (resolution advisory) requires the pilot to climb or ATC calls for immediate climb (preferably during descent which requires a significant change in aircraft attitude).	x	x		x					
			DES			TAWS warning when deviating from planned descent routing, requiring immediate response	x			x	x				
EVAL or			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	
	Monitoring,		ALL	The scenarios should be realistic and	Recognise mismanaged aircraft	Deviations from the flight path, in pitch attitude, speed, altitude, bank angle		x					x		

	cross-checking, error management, mismanaged aircraft state	A	ALL	relevant, and should be used for the purpose of demonstration and reinforcement of effective monitoring.	state. Observe the pilot's behaviour: how the pilot is mitigating errors, performing cross-checking, monitoring performance and	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		
		APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)				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	

							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 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 APP			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 practice 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 exists. 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								

	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		Flight phase	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)															
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. Table2 of AMC1 ORO.FC.220&230: Exercises for upset recovery training		Intentionally blank								
					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									

			CRZ CRZ			4.	Recovery from nose low at various bank angles	x			x			x		
			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*
	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	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	
						Dilemma: Visual acquisition of conflicting traffic followed by an ACAS warning (resolution advisory) triggered by the same or other traffic. Even if the traffic is in sight, the pilot should follow the RA.	x		x	X					
						While in descent, ACAS warning (traffic advisory) of an aircraft below. The crew should not initiate an avoidance manoeuvre based on TA (except decreasing the rate of descent unless otherwise instructed by ATC, etc.). This example scenario can be done during climb with conflicting traffic above.	x				x	x			

END GEN3 JET

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

GENERATION 3 (TURBOPROP) – TABLE OF ASSESSMENT AND TRAININGS 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	Rejected take-off 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). However, if the EBT programme does not include the example scenario element 'emergency descent' in the training topic 'automation management', the emergency descent procedures should be completed and should not stop once the aircraft is stabilised in emergency descent configuration.	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 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.	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). 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 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.	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.	ACAS warning (resolution advisory), 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	The means of mitigating errors are included in this topic. The errors are described as mishandled auto flight systems, inappropriate mode	Maintain mode awareness of the auto flight system(s), including engagement and automatic transitions.	Amendments to ATC cleared levels during altitude capture modes to force mode awareness and intervention	x		x				x		
						ACAS warning (resolution advisory to level off) during climb or descent; for example, close to the cleared level when the capture mode has already been activated.	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 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	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	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	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	EBT data sources to be a highly effective competency in mitigating risk and improving safety through pilot performance.	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.	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	

	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 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 (resolution advisory) immediately following a go-around, with a descent manoeuvre required. (The RA should be a command for descent when the aircraft is above 1 100 ft AGL.)		x			x	x	x	X	
EVAL or	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*
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 warning (resolution advisory) requires the pilot to descend or ATC calls for immediate descent preferably during climb which requires a significant change in aircraft attitude)	x	x		x					
						ACAS warning (resolution advisory) requires the pilot to climb or ATC calls for immediate climb (preferably during descent which requires a significant change in aircraft attitude).	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	

	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 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		
	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 (notreported)		x					x		
			APP LDG			Crosswinds with or without strong gusts on approach, final approach and landing (within and beyond limits)				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	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	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 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.		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	For full details, see the malfunction equivalency methodology.		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		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					
			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	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								

				item is to ensure that pilots are exposed to this during the programme.											
	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								

	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&230for 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. Table2 of AMC1 ORO.FC.220&230: Exercises for upset recovery training A. **Recovery from developed upsets**	Intentionally blank								
			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 CRZ			4. Recovery from nose low at various bank angles	x			x			x	x	
			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		

							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)															
E	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 (notreported)	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	
			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	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
			GND TO LDG		Recognise hazardous runway condition.	Planned anticipated hazardous conditions with dispatch information provided to facilitate planning and execution of appropriate procedures						x			X

	Runway or taxiway condition	C	GND TO LDG	Contamination or surface quality of the runway, taxiway, or tarmac including foreign objects	Observe limitations. Take appropriate action. Apply the appropriate procedures correctly. Assure aircraft control.	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	
						Dilemma: Visual acquisition of conflicting traffic followed by an ACAS warning (resolution advisory) triggered by the same or other traffic. Even if the traffic is in sight, the pilot should follow the RA.	x		x	X					
						While in descent, ACAS warning (traffic advisory) of an aircraft below. The crew should not initiate an avoidance manoeuvre based on TA (except decreasing the rate of descent unless otherwise instructed by ATC, etc.). This example scenario can be done during climb with conflicting traffic above.	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). However, if the EBT programme does not include the example scenario element 'emergency descent' in the training topic 'automation management', the emergency descent procedures should be completed and should not stop once the aircraft is stabilised in emergency descent configuration.	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*	*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	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). Low-visibility take-off, preferably in the lowest approved visibility	flight envelope. Apply knowledge of the relationship between aircraft attitude, speed and thrust.	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					

	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	
			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 (resolution advisory), 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		
					ACAS warning (resolution advisory to level off) during climb or descent; for example, close to the cleared level when the capture mode has already been activated.	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						
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:	GPS failure prior to commencement of approach associated with position drift and a terrain alert					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 <u>management of information:</u> Have an awareness of the aircraft state in its environment; project and anticipate changes. <u>Workload management:</u> 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 (resolution advisory) immediately following a go-around, with a descent manoeuvre required. (The RA should be a command for descent when the aircraft is above 1 100 ft AGL).		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								
E	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		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	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-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 warning (resolution advisory) requires the pilot to descend or ATC calls for immediate descent preferably during climb which requires a significant change in aircraft attitude)	x	x		x					
						ACAS warning (resolution advisory) requires the pilot to climb or ATC calls for immediate climb (preferably during descent which requires a significant change in aircraft attitude).	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	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		DES APP	Reinforce stabilised approach philosophy and adherence to defined parameters. Encourage go-arounds when crews are outside these		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		

	approach	A	APP	parameters. Develop and sustain competencies related to the management of high-energy situations.		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, 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.	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				x				x		x		X

			CRZ			Fuel leak (management of consequences)									
			TO	Unless specified otherwise in the		Malfunction on take-off high speed below V1	x				x	x			
			TO	operational suitability data, at least		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					
	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	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	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	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	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. Table2 of AMC1 ORO.FC.220&230: Exercises for upset recovery training A. **Recovery from developed upsets**	Intentionally blank								
			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 CRZ			4. Recovery from nose low at various bank angles	x			x			x	x	

			APP	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.	component 5) Note: The operator should assess if the exercises should be practised for the either seat qualification.	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	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	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	
						Dilemma: Visual acquisition of conflicting traffic followed by an ACAS warning (resolution advisory) triggered by the same or other traffic. Even if the traffic is in sight, the pilot should follow the RA.	x		x	X					
						While in descent, ACAS warning (traffic advisory) of an aircraft below. The crew should not initiate an avoidance manoeuvre based on TA (except decreasing the rate of descent unless otherwise instructed by ATC, etc.). This example scenario can be done during climb with conflicting traffic above.	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.FC.232 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, postflight & flight closing	Ground phases up to when the crew increases thrust for taking-off 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 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 goaround 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 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	A310/A300-600, B737- 300/400/500, B737-600/700/800 (NG), B737 MAX, B757, B767, B747-400, B747-8, B717, BAE 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

GM1 ORO.FC.235(e);(f) Pilot qualification to operate in either pilot's seat

DIFFERENCES BETWEEN LEFT AND RIGHT-HAND SEATS

The differences between left- and right-hand seats may not be significant in cases where, for example, the autopilot is used.

AMC1 ORO.FC.236 Pilot qualification to operate in either pilot's seat — helicopters

GENERAL

(a) The operator should either conduct a check every year or alternate training and checking every year. The training and checking may take place during or together with an operator proficiency check or an aircraft/FSTD training session.
(b) When engine-out manoeuvres are carried out in an aircraft, the engine failure should be simulated.
(c) Helicopter pilots should meet one of the following criteria:
  (1) complete their operator proficiency checks from left- and right-hand seats, on alternate proficiency checks; or
  (2) for multi-engined helicopters, if two consecutive operator proficiency checks are conducted from the same seat, the pilot should complete at least the following from the other pilot's seat:
    (i) an engine failure during take-off;
    (ii) a one-engine-inoperative approach and go-around; and
    (iii) a one-engine-inoperative landing
  (3) for single-engined helicopters, if two consecutive operator proficiency checks are conducted from the same seat, the pilot should complete at least one autorotation training or checking from the other pilot's seat.

GM1 ORO.FC.236 Pilot qualification to operate in either pilot's seat — helicopters

QUALIFICATION TO FLY IN EITHER PILOT'S SEAT — NOMINATED COMMANDER CONDUCTING LINE CHECKS

In the case of a line check revalidation of a fully qualified commander in single-pilot operations, the line checker does not require a qualification to operate in either pilot's seat, regardless of the seat he or she occupies, provided that the line checker has no pilot duties other than checking.

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 Part 21 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, 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 Part 21 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 Part 21 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 Part 21 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 Part 21 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 OPCs checks 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 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 Part 21 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 Part 21 for the relevant types or variants;

(v) recent experience requirements established in Part FCL 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 Part 21 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 OPCs every year. When credits are defined in the operational suitability data established in accordance with Part 21 for operator proficiency checks to alternate between the types, each OPCs should revalidate the OPC for the other type(s). The OPC may be combined with the proficiency checks for revalidation or renewal of the aeroplane type rating or the instrument rating in accordance with Part-FCL. 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 BAR 1 Part FCL. 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 Part 21 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 BAR 8 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

(1) If a flight crew member operates more than one type or variant, the following provisions should be met:

(i) The recency requirements and the requirements for recurrent training and checking should be met and confirmed prior to CAT operations on any type, and the minimum number of flights on each type within a 3 months' period specified in the operations manual.

(ii) ORO.FC.230 requirements with regard to recurrent training.

(iii) When credits related to the training, checking and recent experience requirements are defined in operational suitability data established in accordance with Part 21 for the relevant types or variants, the requirements of ORO.FC.230 with regard to proficiency checks may be met by a 6 monthly check on any one type or variant operated. However, a proficiency check on each type or variant operated should be completed every 12 months.

(iv) If a helicopter has a maximum certified take-off mass (MCTOM) of more than 5 700 kg or a maximum operational passenger seating configuration (MOPSC) of more than 19:

(A) the flight crew member should not fly more than two helicopter types, unless credits related to the training, checking and recent experience requirements are defined in operational suitability data established in accordance with Part 21 for the relevant types or variants;

(B) a minimum of 3 months and 150 hours experience on the type should be achieved before the flight crew member should commence the conversion course onto the new type or variant, unless credits related to the training, checking and recent experience requirements are defined in the operational suitability data established in accordance with Part 21 for the relevant types or variants;

(C) 28 flying days or 50 hours experience should then be achieved exclusively on the new type or variant, unless credits related to the training, checking and recent experience requirements are defined in the operational suitability data established in accordance with Part 21 for the relevant types or variants; and

(D) a flight crew member should not be rostered to fly more than one type during a single duty period unless the following conditions are met:

- There should be sufficient time off between the two types for a comprehensive training or self-training on the differences between the types. The time off should not include flight preparation duties.
- The training referred in the previous paragraph should include time in flight or in the cockpit or in a device representative of the cockpit of the next type to be flown.
- The training syllabus should be based on a risk assessment of the operator and be described in the operations manual. The training should take place every time the pilot changes types, whether within the same duty period or not.

(v) In the case of all other helicopters, the flight crew member should not operate more than three helicopter types or or groups of types in CAT, NCC and SPO unless credits related to the training, checking and recent experience requirements are defined in the operational suitability data established in accordance with Part 21 for the relevant types or variants.

(vi) The operator should only define a group of types for the purpose of this AMC if the following conditions are met:

(A) A group of helicopter types should either include only single-engined turbine helicopters operated only under VFR or it should include only single-engined piston helicopters operated only under VFR.

(B) The operator should define conditions for flying more than one type or variant on the same day, including sufficient time for a briefing or self-briefing on changing types or variants.

(C) The operator should define the maximum number of types and variants that can be flown on the same day.

(vii) Points (v) and (vi) above apply whenever a flight crew member operates more than one type or variant in CAT.

(c) Combination of helicopter and aeroplane

(1) The flight crew member should only operate a combination of helicopters and aeroplanes if one of the following conditions is met:

(i) operations under CAT, NCC and SPO should be limited to one type or class of aeroplane and one helicopter type; or

(ii) operations under CAT, NCC and SPO should be limited to one type or class of aeroplane and one group of helicopter types defined in (b)(vi) above; or

(iii) operations under CAT, NCC and SPO should be limited to only performance class B aeroplanes from the single-pilot classes of reciprocating engine aeroplanes and one helicopter type or group of helicopter types defined in (b)(vi) above.

(2) If a helicopter type is covered by point (b)(1)(iv), then (b)(1)(iv)(B), (C) and (D) should also apply in this case.

AMC1 ORO.FC.A.245 Alternative training and qualification programme

COMPONENTS AND IMPLEMENTATION

(a) Alternative training and qualification programme (ATQP) components

The ATQP should comprise the following:

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

(i) The programme should demonstrate that the operator is able to improve the training and qualification standards of flight crew to a level that exceeds the standards prescribed in ORO.FC and Subpart E of Part-SPA (SPA.LVO).

(ii) The operator’s training needs and established operational and training objectives.

(iii) A description of the process for designing and gaining approval for the operator’s flight crew qualification programmes. This should include quantified operational and training objectives identified by the operator’s internal monitoring programmes. External sources may also be used.

(iv) A description of how the programme will:

(A) enhance safety;

(B) improve training and qualification standards of flight crew;

(C) establish attainable training objectives;

(D) integrate CRM in all aspects of training and ensure that each flight crew member undergoes specific modular CRM training. All major topics of CRM training should be covered by distributing modular training sessions as evenly as possible over each 3-year period;

(E) develop a support and feedback process to form a self-correcting training system;

(F) institute a system of progressive evaluations of all training to enable consistent and uniform monitoring of the training undertaken by flight crew;

(G) enable the operator to be able to respond to new aeroplane technologies and changes in the operational environment;

(H) foster the use of innovative training methods and technology for flight crew instruction and the evaluation of training systems; and

(I) make efficient use of training resources, specifically to match the use of training media to the training needs.

(2) A task analysis to determine:

(i) knowledge;

(ii) required skills;

(iii) associated skill-based training; and

(iv) validated behavioural markers, where appropriate.

For each aeroplane type/class to be included within the ATQP the operator should establish a systematic review that determines and defines the various tasks to be undertaken by the flight crew when operating that type/class. Data from other types/classes may also be used. The analysis should determine and describe the knowledge and skills required to complete the various tasks specific to the aeroplane type/class and/or type of operation. In addition, the analysis should identify the appropriate behavioural markers that should be exhibited. The task analysis should be suitably validated in accordance with (b)(3). The task analysis, in conjunction with the data gathering programme(s), permits the operator to establish a programme of targeted training together with the associated training objectives.

(3) Curricula. The curriculum structure and content should be determined by task analysis, and should include proficiency objectives, including when and how these objectives should be met.

(i) The training programme should have the following structure:

(A) Curriculum, specifying the following elements:

(a) Entry requirements: a list of topics and content, describing what training level will be required before start or continuation of training.

(b) Topics: a description of what will be trained during the lesson.

(c) Targets/Objectives

(i) Specific target or set of targets that have to be reached;

(ii) and fulfilled before the training course can be continued.

(iii) Each qualification event that is required by the programme should specify the training that is required to be undertaken and the required standard to be achieved.

(B) Daily lesson plan

(a) Each lesson/course/training or qualification event should have the same basic structure. The topics related to the lesson should be listed and the lesson targets should be unambiguous.

(b) Each lesson/course or training event whether classroom, CBT or simulator should specify the required topics with the relevant targets to be achieved.

(4) A specific training programme for:

(i) each aeroplane type/class within the ATQP;

(ii) instructors (class rating instructor rating/synthetic flight instructor authorisation/type rating instructor rating — CRI/SFI/TRI), and other personnel undertaking flight crew instruction; and

(iii) examiners (class rating examiner/synthetic flight examiner/type rating examiner — CRE/SFE/TRE).

This should include a method for the standardisation of instructors and examiners.

Personnel who perform training and checking of flight crew in an operator's ATQP should receive the following additional training on:

(A) ATQP principles and goals;

(B) knowledge/skills/behavioural markers as learnt from task analysis;

(C) line-oriented evaluation (LOE)/LOFT scenarios to include triggers/ behavioural markers/event sets/observable behaviour;

(D) qualification standards;

(E) harmonisation of assessment standards;

(F) behavioural markers and the systemic assessment of CRM;

(G) event sets and the corresponding desired knowledge/skills and behaviour of the flight crew;

(H) the processes that the operator has implemented to validate the training and qualification standards and the instructors part in the ATQP quality control; and

(I) line-oriented quality evaluation (LOQE).

(5) A feedback loop for the purpose of curriculum validation and refinement, and to ascertain that the programme meets its proficiency objectives.

(i) The feedback should be used as a tool to validate that the curricula are implemented as specified by the ATQP; this enables substantiation of the curriculum, and that proficiency and training objectives have been met. The feedback loop should include data from operations flight data describe whether the overall targets/objectives of training are being achieved and should prescribe any corrective action that needs to be undertaken.

(ii) The programme's established quality control mechanisms should at least review the following:

(A) procedures for approval of recurrent training;

(B) ATQP instructor training approvals;

(C) approval of event set(s) for LOE/LOFT;

(D) procedures for conducting LOE and LOQE.

(6) A method for the assessment of flight crew during conversion and recurrent training and checking. The assessment process should include event-based assessment as part of the LOE. The assessment method should comply with ORO.FC.230.

(i) The qualification and checking programmes should include at least the following elements:

(A) a specified structure;

(B) elements to be tested/examined;

(C) targets and/or standards to be attained;

(D) the specified technical and procedural knowledge and skills, and behavioural markers to be exhibited.

(ii) An LOE event should comprise tasks and sub-tasks performed by the crew under a specified set of conditions. Each event has one or more specific training targets/objectives, which require the performance of a specific manoeuvre, the application of procedures, or the opportunity to practise cognitive, communication or other complex skills. For each event the proficiency that is required to be achieved should be established. Each event should include a range of circumstances under which the crews' performance is to be measured and evaluated. The conditions pertaining to each event should also be established and they may include the prevailing meteorological conditions (ceiling, visibility, wind, turbulence, etc.), the operational environment (navigation aid inoperable, etc.), and the operational contingencies (non-normal operation, etc.).

(iii) The markers specified under the operator's ATQP should form one of the core elements in determining the required qualification standard. A typical set of markers is shown in the table below:

Event	Marker
Awareness of aeroplane systems:	1. Monitors and reports changes in automation status
	2. Applies closed loop principle in all relevant situations
	3. Uses all channels for updates
	4. Is aware of remaining technical resources

(iv) The topics/targets integrated into the curriculum should be measurable and progression on any training/course is only allowed if the targets are fulfilled.

(v) The assessment and the subsequent grading of the performance of flight crew members should include the following steps:

(A) Observe performance (behaviours) during the simulator session.

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

(C) Classify observations against the set of behavioural markers and allocate the behavioural markers to each type of knowledge or skill or task, using amongst others the facilitation technique. If the operator has developed a set of competencies, it may allocate the behavioural markers to each competency.

(D) Assess and evaluate (grade): assess the performance by determining the root cause(s). Low performance would normally indicate the area of performance to be remediated in subsequent phases or modules or training sessions. Evaluate (grade) the performance by determining a grade using the methodology defined by the operator.

(7) A data monitoring/analysis programme consisting of the following:

(i) A flight data monitoring (FDM) programme, as described in AMC1 ORO.AOC.130. Data collection should reach a minimum of 60 % of all relevant flights conducted by the operator before ATQP approval is granted. This proportion may be increased as determined by the Brunei DCA.

(ii) An advanced FDM when an extension to the ATQP is requested: an advanced FDM programme is determined by the level of integration with other safety initiatives implemented by the operator, such as the operator's safety management system. The programme should include both systematic evaluations of data from a FDM programme and flight crew training events for the relevant crews. Data collection should reach a minimum of 80 % of all relevant flights and training conducted by the operator. This proportion may be varied as determined by the Brunei DCA.

The purpose of a FDM or advanced FDM programme for ATQP is to enable the operator to:

(A) provide data to support the programme's implementation and justify any changes to the ATQP;

(B) establish operational and training objectives based upon an analysis of the operational environment; and

(C) monitor the effectiveness of flight crew training and qualification.

(iii) Data gathering: the data analysis should be made available to the person responsible for ATQP within the organisation. The data gathered should:

(A) include all fleets that are planned to be operated under the ATQP;

(B) include all crews trained and qualified under the ATQP;

(C) be established during the implementation phase of ATQP; and

(D) continue throughout the life of the ATQP.

(iv) Data handling: the operator should establish a procedure to ensure the confidentiality of individual flight crew members, as described by AMC1 ORO.AOC.130.

(v) The operator that has a flight data monitoring programme prior to the proposed introduction of ATQP may use relevant data from other fleets not part of the proposed ATQP.

(b) Implementation. The operator should develop an evaluation and implementation process, including the following stages:

(1) A safety case that demonstrates equivalency of:

(i) the revised training and qualification standards compared to the standards of ORO.FC and/or Subpart E of Part-SPA (SPA.LVO) prior to the introduction of ATQP; and

(ii) any new training methods implemented as part of ATQP.

The safety case should encompass each phase of implementation of the programme and be applicable over the lifetime of the programme that is to be overseen. The safety case should:

– demonstrate the required level of safety;

– ensure the required safety is maintained throughout the lifetime of the programme; and

– minimise risk during all phases of the programme's implementation and operation.

The elements of a safety case include:

– planning: integrated and planned with the operation (ATQP) that is to be justified;

– criteria;

– safety-related documentation, including a safety checklist;

- programme of implementation to include controls and validity checks; and
- oversight, including review and audits.

Criteria for the establishment of a safety case. The safety case should:

- be able to demonstrate that the required or equivalent level of safety is maintained throughout all phases of the programme;
- be valid to the application and the proposed operation;
- be adequately safe and ensure the required regulatory safety standards or approved equivalent safety standards are achieved;
- be applicable over the entire lifetime of the programme;
- demonstrate completeness and credibility of the programme;
- be fully documented;
- ensure integrity of the operation and the maintenance of the operations and training infrastructure;
- ensure robustness to system change;
- address the impact of technological advance, obsolescence and change; and
- address the impact of regulatory change.

(2) A task analysis, as required by (a)(2), to establish the operator's programme of targeted training and the associated training objectives.

(3) A period of operation whilst data is collected and analysed to validate the safety case and task analysis. During this period the operator should continue to operate in accordance with ORO.FC and/or Subpart E of Part-SPA (SPA.LVO), as applicable. The length of this period should be determined by the Brunei DCA.

GM1 ORO.FC.A.245 Alternative training and qualification programme

TERMINOLOGY

(a) 'Line-oriented evaluation (LOE)' is an evaluation methodology used in the ATQP to evaluate trainee performance, and to validate trainee proficiency. LOEs consist of flight simulator scenarios that are developed by the operator in accordance with a methodology approved as part of the ATQP. The LOE should be realistic and include appropriate weather scenarios and, in addition, should fall within an acceptable range of difficulty. The LOE should include the use of validated event sets to provide the basis for event-based assessment.

(b) 'Line-oriented quality evaluation (LOQE)' is one of the tools used to help evaluate the overall performance of an operation. LOQEs consist of line flights that are observed by appropriately qualified operator personnel to provide feedback to validate the ATQP. The LOQE should be designed to look at those elements of the operation that are unable to be monitored by FDM or Advanced FDM programmes.

(c) 'Skill-based training' requires the identification of specific knowledge and skills. The required knowledge and skills are identified within an ATQP as part of a task analysis and are used to provide targeted training.

(d) 'Event-based assessment' is the assessment of flight crew to provide assurance that the required knowledge and skills have been acquired. This is achieved within an LOE. Feedback to the flight crew is an integral part of event-based assessment.

(e) Safety case means a documented body of evidence that provides a demonstrable and valid justification that the ATQP is adequately safe for the given type of operation.

GM2 ORO.FC.A.245

It is possible to implement EBT in accordance with ICAO Doc 9995 in the framework of an approved alternative training and qualification programme (ATQP). GM1 ORO.FC.230(a);(b);(f) may be used to guide the operator towards EBT according to ORO.FC.A.245.

An operator holding approval for ATQP and wishing to implement EBT may use the guidance material in GM1 ORO.FC.230(a);(b);(f) for the conduct of the Licence Proficiency Check, or where the Licence Proficiency Check and Operator Proficiency Check are combined. For this purpose, the evaluation phase is equivalent to the line-oriented evaluation (LOE) described in ORO.FC.A.245(d).

GM3 ORO.FC.A.245 Alternative training and qualification programme

BEHAVIOURAL MARKERS AND OBSERVABLE BEHAVIOURS — ATQP & EBT

(a) Behavioural markers in ATQP are observable behaviours that contribute to superior or substandard performance within a flight (including pre-flight and post-flight duties).

(b) A good behavioural marker:
- (1) describes a specific, observable behaviour, not an attitude or personality trait, with clear definition (enactment of skills or knowledge is shown in behaviour);
- (2) has demonstrated a causal relationship to performance outcome, without necessarily being present in all situations, and with its appropriateness possibly depending on context;
- (3) uses simple phraseology; and
- (4) describes a clear concept.

(c) The characteristics of good behavioural marker systems are:
- (1) validity: in relation to performance outcome;
- (2) reliability: instructor or examiner concordance (inter-rater reliability), internal consistency;
- (3) sensitivity: in relation to levels of performance;
- (4) transparency: the pilots receiving the training or checking understand the performance criteria against which they are being rated; availability of reliability and validity data;
- (5) usability: easy to train, simple framework, easy to understand, domain-appropriate language, sensitive to rater (i.e. examiner, instructor) workload, easy to observe;
- (6) ability to provide a focus for training goals and needs; and
- (7) minimal overlap between components.

(d) For EBT mixed implementation, the operator may refer to the Annex I definitions of 'behaviour' and 'observable behaviour' which include the concept of behavioural marker in ATQP. In other words, the EBT OBs may be used as behavioural markers under ATQP.

AMC1 ORO.FC.A.245(a) Alternative training and qualification programme

OPERATOR EXPERIENCE

The appropriate experience should be at least 2 years' continuous operation.

AMC1 ORO.FC.A.245(d);(e)(2) Alternative training and qualification programme

COMBINATION OF CHECKS

(a) The LOE may be undertaken with other ATQP training. The operator should ensure that training and checking are clearly distinguished and described in the operations manual.

(b) The line check may be combined with a line-oriented quality evaluation (LOQE).

(c) Complementary CRM assessment

The CRM assessment should take place in a line-oriented flight scenario (LOFT, LOE or line-oriented section of the OPC) of an FSTD session. This assessment complements the CRM assessment taking place during the line check /LOQE, but it is not part of the line check / LOQE.

AMC1 ORO.FC.A.245(g) Alternative training and qualification programme

ATQP PROGRAMME — FSTD

The FSTD qualification level should be adequate to complete proficiency checks; therefore, the ATQP programme should be conducted in a full-flight simulator (FFS) level C or D.

GM1 ORO.FC.A.245(e)(2) Alternative training and qualification programme

LINE CHECK IN MIXED FLEET OPERATION UNDER ATQP

The extension of validity for the line check is intended for single fleet operation. For mixed fleet operation, the operator needs to observe the provisions in the operational suitability data established in accordance with BAR 8. Usually the operational suitability data refers to one line check per year in alternate aircraft types.

AMC1 ORO.FC.320 Operator conversion training and checking

OPERATOR PROFICIENCY CHECK

The operator proficiency check should take place at the end of the operator conversion training programme defined in AMC3 ORO.FC.120.

AMC1 ORO.FC.325 Equipment and procedure training and checking

SPECIALISED OPERATIONS

(a) If the equipment and procedure training includes training for SOPs related to a specialised operation, points (b) to (f) of AMC3 ORO.FC.120 should apply.

(b) The operator proficiency check should take place at the end of the aircraft/FSTD training programme defined in AMC3 ORO.FC.120.

AMC1 ORO.FC.330 Recurrent training and checking — operator proficiency check

SPO — RECURRENT TRAINING

(a) The training should include:

(1) ground training, including all the following:

(i) aircraft systems;

(ii) normal procedures, which include flight planning and ground-handling and flight operations, including performance, mass and balance, fuel schemes selection of alternates, and ground de-icing/anti-icing;

(iii) abnormal and emergency procedures, which include pilot incapacitation as applicable;

(iv) a review of relevant samples of accident/incident and occurrences to increase awareness of the occurrences that may be relevant for the intended operation;

(2) emergency and safety equipment training if one or more task specialists are on board. The training should ensure that all emergency equipment can be used timely and efficiently, that an emergency evacuation and first aid can be conducted, taking into account the training and operating procedures of the task specialist(s); and

(3) aircraft/FSTD training relevant to the type or variant of aircraft on which the flight crew operates.

(b) Additional training relevant to the specialised tasks should be either ground training or aircraft/FSTD training or both, in accordance with the results of the operator's risk assessment.

SPO — OPERATOR PROFICIENCY CHECK

(c) The SPO operator proficiency check should take place at least annually. If the SPO operator combines the operator proficiency check with a licence proficiency check, the check should cover both the normal, abnormal and emergency procedures relevant to the type or variant and the relevant aspects associated with the specialised tasks described in the operations manual.

(d) If the SPO operator does not combine the operator proficiency check with a licence proficiency check, the operator proficiency check may not include the normal, abnormal and emergency procedures relevant to the type or variant that are already covered within the licence proficiency check. The operator proficiency check then covers the relevant aspects associated with the specialised task described in the operations manual.

(e) The flight crew should be assessed on their CRM skills in accordance with the methodology described in AMC1 and AMC2 ORO.FC.115 and as specified in the operations manual. CRM assessment should not be used as a reason for a failure of the operator proficiency check unless the observed behaviour could lead to an unacceptable reduction in safety margin.

(f) Each flight crew member should complete the operator proficiency checks as part of the normal crew complement.

SPO — RELEVANT PROCEDURES TO BE TRAINED AND CHECKED

(g) The operator should determine, based on a risk assessment, which procedures associated with the specialised tasks are relevant to be trained and checked. The following should be taken into account:

(1) specific risks associated with the specialised operation;

(2) for abnormal and emergency procedures, the criticality of the situation or failure and the impact of training and checking on ensuring a positive outcome; and

(3) for normal procedures, the amount of experience and recent experience accumulated since the previous training or checking.

(h) The operator should establish a training and checking programme to ensure that normal, abnormal and emergency procedures covering the relevant aspects associated with the specialised tasks are:

(1) trained and checked over a 2-year cycle for SPO operators engaged in only one specialised operation;

(2) trained and checked over a 2-year cycle for pilots engaged in only one specialised operation;

(3) trained and checked over a 3-year cycle, if neither (1) nor (2) applies;

(4) trained and checked before a pilot with no recent experience of the specialised operation in the last 6 months resumes the specialised operation.

(i) Whenever an item requires both training and checking, the recurrent aircraft/FSTD training of a single task or manoeuvre should be separate from, and should not take place at the same time as, an operator proficiency check of the item.

(j) Specialised operations may be exposed to specific risks such as routinely flying within the height velocity envelope of a helicopter. The operator should avoid taking unnecessary risks during aircraft training and checking and should take advantage of simulation devices, if possible, to train for such situations.

COMBINED CAT AND SPO TRANING AND CHECKING

(k) If the operator is involved in both CAT and SPO, the CAT training and checking programme may include elements that are relevant to the specialised tasks. If this is the case, these training and checking elements may be credited towards compliance with ORO.FC.330 as approved by the authority under ORO.FC.145(c).

GM1 ORO.FC.330 Recurrent training and checking — operator proficiency check

SPO — RELEVANT PROCEDURES TO BE TRAINED AND CHECKED

The procedures to be trained in the aircraft/FSTD may be different from the procedures to be checked if both complement each other, as defined by the operator in AMC1 ORO.FC.330, considering the following: (a) It may happen that several training elements are covered by a single check; and (b) Certain complex procedures are best explored under recurrent training, where the trainee will derive more benefit and training to proficiency is also employed.

Section 3 - Additional requirements for commercial specialised operations and CAT operations referred to in ORO.FC.005(b)(1) and (2)

Subpart CC - Cabin Crew

Section 1 - Common requirements

AMC1 ORO.CC.100 Number and composition of cabin crew

DETERMINATION OF THE NUMBER AND COMPOSITION OF CABIN CREW

(a) When determining the minimum number of cabin crew required to operate aircraft engaged in CAT operations, factors to be taken into account should include:

(1) the number of doors/exits;

(2) the type(s) of doors/exits and the associated assisting evacuation means;

(3) the location of doors/exits in relation to cabin crew stations and the cabin layout;

(4) the location of cabin crew stations taking into account direct view requirements and cabin crew duties in an emergency evacuation including:

(i) opening floor level doors/exits and initiating stair or slide deployment;

(ii) assisting passengers to pass through doors/exits; and

(iii) directing passengers away from inoperative doors/exits, crowd control and passenger flow management;

(5) actions required to be performed by cabin crew in ditching, including the deployment of slide-rafts and the launching of life-rafts;

(6) additional actions required to be performed by cabin crew members when responsible for a pair of doors/exits; and

(7) the type and duration of the flight to be operated.

(b) When scheduling cabin crew for a flight, the operator should establish procedures that take account of the experience of each cabin crew member. The procedures should specify that the required cabin crew includes some cabin crew members who have at least 3 months experience as an operating cabin crew member.

GM1 ORO.CC.100 Number and composition of cabin crew

MINIMUM NUMBER OF CABIN CREW

(a) When determining the minimum required cabin crew for its specific aircraft cabin configuration, the operator should:

(1) request information regarding the minimum number of cabin crew established by the aircraft type certificate (TC) holder or other design organisation responsible for showing compliance with the evacuation requirements of the applicable Certification Specifications; and

(2) take into account the factors specified in AMC1 ORO.CC.100, as applicable.

(b) The number of cabin crew referred to in ORO.CC.100 (b)(1) means either:

(1) the number of cabin crew who actively participated in the aircraft cabin during the relevant emergency evacuation demonstration, or who were assumed to have taken part in the relevant analysis, carried out by the aircraft TC holder when demonstrating the maximum passenger seating capacity (MPSC) of the aircraft type at the time of initial type certification; or

(2) a lower number of cabin crew who actively participated in a subsequent emergency evacuation demonstration, or who were assumed to have taken part in the relevant analysis, and for which approval has been obtained for a cabin configuration other than the MPSC, either by the TC holder or by another design organisation. The operator should obtain a clear indication of that number which is specified in the related documentation.

AMC1 ORO.CC.100(d)(2) Number and composition of cabin crew

PROCEDURES FOR NON-COMMERCIAL OPERATIONS WITH NO OPERATING CABIN CREW ON BOARD AN AIRCRAFT WITH AN MOPSC OF MORE THAN 19 AND MAXIMUM 19 PASSENGERS

The operator should asses the risk of operating a flight with no cabin crew member and ensure that the following procedures mitigate the risks and provide appropriate level of protection of the aircraft occupants:

(a) Flight crew members assigned to these flights should receive training on operations where no cabin crew is required in accordance with ORO.FC.220 and ORO.FC.230.

(b) The operator should consider the categories of passengers to be carried on such flights, who may be knowledgeable or not about the aircraft type and procedures in normal, abnormal and emergency situations.

(c) The procedures should cover at least the following elements, if applicable:

(1) communication and coordination between flight crew members and passengers;

(2) flight crew member incapacitation;

(3) cabin surveillance;

(4) rapid egress from the aircraft in case of rapid disembarkation or evacuation;

(5) operation and use of emergency exits and assisting evacuation means;

(6) location and use of oxygen;

(7) location and use of life jackets;

(8) passenger seating in order to maintain:

(i) an easy access to emergency exits;

(ii) timely communication with flight crew member(s); and

(iii) the required mass and balance of the aircraft;

(9) passenger briefing in accordance with Annex IV (Part-CAT), including information on the location and use of equipment not displayed in the operator's safety briefing material, such as a fire extinguisher, first-aid equipment (e.g. first-aid kit, defibrillator), smoke hood, etc.; and

(10) any additional safety instructions that are deemed necessary to ensure passenger protection.

GM1 ORO.CC.100(d)(2) Number and composition of cabin crew

CATEGORIES OF PASSENGERS

(a) The operator should adapt the procedures for non-commercial operations with an aircraft with an MOPSC of more than 19 and maximum 19 passengers and no operating cabin crew on board to the categories of passengers to be carried on such flight. This includes but is not limited to the following groups:

(1) Passengers who are already familiar with the aircraft environment, the procedures in normal operations, abnormal and emergency situations or trained on the aircraft type, e.g. non-operating aircrew members, maintenance personnel, etc.

(2) Passengers who are not familiar with the aircraft environment or procedures in normal operations, abnormal and emergency situations, e.g. operator's guests, employees, etc.

(3) Passengers who travel frequently on such flights. The operator may consider providing these passengers with training covering all safety and emergency procedures for the given aircraft type as described in AMC1.1 CAT.OP.MPA.170. The operator should be able to show evidence of their training. These passengers may also be provided with an extended briefing to facilitate communication with flight crew and coordination of all passengers in case of an abnormal or emergency situation.

(4) Special categories of passengers (see CAT.OP.MPA.155).

(b) The operator may include in its procedures a ratio of the categories of passengers described in (a) above that can travel on the same flight.

GM1 ORO.CC.115 Conduct of training courses and associated checking

EQUIPMENT AND PROCEDURES

The following definitions apply for the purpose of training programmes, syllabi and the conduct of training and checking on equipment and procedures:

(a) 'Safety equipment' means equipment installed/carried to be used during day-to-day normal operations for the safe conduct of the flight and protection of occupants (e.g. seat belts, child restraint devices, safety card, safety demonstration kit).

(b) 'Emergency equipment' means equipment installed/carried to be used in case of abnormal and emergency situations that demand immediate action for the safe conduct of the flight and protection of occupants, including life preservation (e.g. drop-out oxygen, crash axe, fire extinguisher, protective breathing equipment, manual release tool, slide-raft).

(c) 'Normal procedures' means all procedures established by the operator in the operations manual for day-to-day normal operations (e.g. pre-flight briefing of cabin crew, pre-flight checks, passenger briefing, securing of galleys and cabin, cabin surveillance during flight).

(d) 'Emergency procedures' means all procedures established by the operator in the operations manual for abnormal and emergency situations. For this purpose, 'abnormal' refers to a situation that is not typical or usual, deviates from normal operation and may result in an emergency.

AMC1 ORO.CC.115(c) Conduct of training courses and associated checking

TRAINING METHODS AND TRAINING DEVICES

(a) The operator should establish training methods that take into account the following:

  (1) training should include the use of cabin training devices, audio-visual presentations, computer-based training and other types of training, as most appropriate to the training element; and

  (2) a reasonable balance between the different training methods should be ensured so that the cabin crew member achieves the level of proficiency necessary for a safe performance of all related cabin crew duties and responsibilities.

(b) When assessing the representative training devices to be used, the operator should:

  (1) take into account that a representative training device may be used to train cabin crew as an alternative to the use of the actual aircraft or required equipment;

  (2) ensure that those items relevant to the training and checking intended to be given accurately represent the aircraft or equipment in the following particulars:

    (i) layout of the cabin in relation to doors/exits, galley areas and safety and emergency equipment stowage as relevant;

    (ii) type and location of passenger seats and cabin crew stations;

    (iii) doors/exits in all modes of operation, particularly in relation to the method of operation, mass and balance and operating forces, including failure of power-assist systems where fitted; and

    (iv) safety and emergency equipment of the type provided in the aircraft (such equipment may be 'training use only' items and, for oxygen and protective breathing equipment, units charged with or without oxygen may be used); and

  (3) assess the following factors when determining whether a door/exit can be considered to be a variant of another type:

    (i) door/exit arming/disarming;

    (ii) direction of movement of the operating handle;

    (iii) direction of door/exit opening;

    (iv) power-assist mechanisms; and

    (v) assisting evacuation means such as slides and ropes.

AMC1 ORO.CC.115(d) Conduct of training courses and associated checking

CHECKING

(a) Checking required for each training course should be accomplished by the method appropriate to the training element to be checked. These methods include:

  (1) practical demonstration;

  (2) computer-based assessment;

  (3) in-flight checks;

  (4) oral or written tests.

(b) Training elements that require individual practical participation may be combined with practical checks.

AMC1 ORO.CC.115(e) Conduct of training courses and associated checking

CREW RESOURCE MANAGEMENT (CRM) TRAINING –MULTI CABIN CREW 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 (cabin training device 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 cabin crew members to interact and communicate in an environment conducive to learning.

(3) Computer-based training

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

(4) Cabin training devices and aircraft

Whenever practicable, relevant parts of CRM training should be conducted in representative cabin training devices that reproduce a realistic operational environment, or in the aircraft. During practical training, interaction should be encouraged.

(5) Integration into cabin crew training

CRM principles should be integrated into relevant parts of cabin crew training and operations, including checklists, briefings and emergency procedures.

(6) Combined CRM training for flight crew and cabin crew

(i) Operators should provide combined training for flight crew and cabin crew during recurrent CRM training.

(ii) The combined training should address at least:

(A) effective communication, coordination of tasks and functions of flight crew and cabin crew; and

(B) mixed multinational and cross-cultural flight crew and cabin crew, and their interaction, if applicable.

(iii) Combined CRM training should be conducted by flight crew CRM trainer or cabin crew CRM trainer.

(iv) There should be an effective liaison between flight crew and cabin crew training departments. Provision should be made for transfer of relevant knowledge and skills between flight crew and cabin crew CRM trainers.

(7) Management system

CRM training should address hazards and risks identified by the operator's management system described in ORO.GEN.200.

(8) Competency-based CRM training

Whenever practicable, the compliance-based approach concerning CRM training may be substituted by a competency-based approach. In this context, CRM training should be characterised by a performance orientation, with emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

(9) Contracted CRM training

If the operator chooses not to establish its own CRM training, another operator, a third party or a training organisation may be contracted to provide the training in accordance with ORO.GEN.205. In case of contracted CRM training, the operator should ensure that the content of the course covers the specific culture, the type of operations and the associated procedures of the operator. When crew members from different operators attend the same course, the CRM training should be specific to the relevant flight operations and to the trainees concerned.

(b) Operator’s CRM training

The operator’s CRM training should cover all elements listed in Table 1 of (g). Several training elements are specified as ‘not required’ for the operator’s CRM training, since they are covered under the introductory CRM course for cabin crew as required in Part-CC.

(c) Operator aircraft type conversion CRM training

If the cabin crew member undertakes the operator’s conversion training on an aircraft type, the applicable CRM training elements should be covered as specified in Table 1 of (g).

(d) Annual recurrent CRM training

(1) Annual recurrent CRM training should be provided in such a way that all CRM training elements specified for the annual recurrent training in Table 1 of (g) are covered over a period not exceeding 3 years.

(2) Operators should update their recurrent CRM training programme over a period not exceeding 3 years. The revision of the programme should take into account information from the operator’s management system.

(e) Senior cabin crew member course

(1) CRM training for senior cabin crew members should be the application of knowledge gained in previous CRM training and operational experience relevant to the specific duties and responsibilities of a senior cabin crew member. The operator should ensure that for the senior cabin crew member course the CRM training elements are integrated into the training, as specified in Table 1 of (g).

(2) During the training the senior cabin crew member should demonstrate the ability:

(i) to manage the operation; and

(ii) to take appropriate leadership and management decisions.

(f) Training elements

The CRM training elements to be covered are specified in Table 1 of (g). The operator should ensure that the following aspects are addressed:

(1) Resilience development

CRM training should address the main aspects of resilience development. The training should cover:

(i) Mental flexibility

Cabin crew should be trained to:

(A) understand that mental flexibility is necessary to recognise critical changes;

(B) reflect on their judgement and adjust it to the unique situation;

(C) avoid fixed prejudices and over-reliance on standard solutions; and

(D) remain open to changing assumptions and perceptions.

(ii) Performance adaptation

Cabin crew should be trained to:

(A) mitigate frozen behaviours, overreactions and inappropriate hesitation; and

(B) adjust actions to current conditions.

(2) Surprise and startle effect

CRM training should address unexpected, unusual and stressful situations including interruptions and distractions. Therefore, CRM training should be designed to prepare cabin crew to master sudden events and associated uncontrolled reactions.

(3) Cultural differences

CRM training should cover cultural differences of multinational and cross-cultural crews. This includes recognising that:

(i) different cultures may have different communication specifics, ways of understanding and approaches to the same situation or problem;

(ii) difficulties may arise when crew members with different mother tongue communicate in a common language which is not their mother tongue; and

(iii) cultural differences may lead to different methods for identifying a situation and solving a problem.

(4) Operator's safety culture and company culture

CRM training should cover the operator's safety culture, its company culture, the type of operations and the associated procedures of the operator. This should include areas of operations that may lead to particular difficulties or involve unusual hazards.

(5) Case studies

(i) CRM training should cover aircraft type-specific case studies, based on the information available within the operator's management system, including:

(A) accident and serious incident reviews to analyse and identify any associated non-technical causal and contributory factors, and instances or examples of lack of CRM; and

(B) analysis of occurrences that were well managed.

(ii) If relevant aircraft type-specific or operator-specific case studies are not available, the operator should consider other case studies relevant to the scale and scope of its operations.

(g) CRM training syllabus

Table 1 below specifies which CRM training elements should be covered in each type of training. The levels of training in Table 1 can be described as follows:

(1) 'Required' means training that should be instructional or interactive in style to meet the objectives specified in the CRM training programme or to refresh and strengthen knowledge gained in a previous training.

(2) 'In-depth' means training that should be instructive or interactive in style taking full advantage of group discussions, team task analysis, team task simulation, etc., for the acquisition or consolidation of knowledge, skills and attitudes. The CRM training elements should be tailored to the specific needs of the training phase being undertaken.

Table 1 — Cabin crew CRM training

CRM TRAINING ELEMENTS to be covered	Operator's CRM Training	Operator Aircraft Type Conversion Training	Annual Recurrent Training	Senior Cabin Crew (SCC) Course
General Principles				
Human factors in aviation; General instructions on CRM principles and objectives; Human performance and limitations; Threat and error management.	Not required (as covered under initial training required by Part-CC)	Required	Not Required	Required
Relevant to the individual cabin crew member				
Personality awareness, human error and reliability, attitudes and behaviours, self- assessment and self-critique; Stress and stress Management; Fatigue and vigilance; Assertiveness, situation awareness, information acquisition and processing.	Required	Required	Required (3 year cycle)	Required
Relevant to the entire aircraft crew				
Shared situation awareness, shared information acquisition and processing; Workload management; Effective communication and coordination between all crew members including the flight crew as well as inexperienced cabin crew members; Leadership, cooperation, synergy, delegation, decision-making, actions; Resilience development; Surprise and startle effect; Cultural differences; Identification and management of the passenger human factors: crowd control, passenger stress, conflict management, medical factors.	In-depth	Required when relevant to the type(s)	Required	In-depth
Specifics related to aircraft types (narrow-/wide-bodied, single-/multideck), flight crew and cabin crew composition and number of passengers	Required	In-depth	Required (3-year cycle)	In-depth

Relevant to the operator and the organisation				
Operator's safety culture and company culture, standard operating procedures (SOPs), organisational factors, factors linked to the type of operations; Effective communication and coordination with other operational personnel and ground services; Participation in cabin safety incident and accident reporting.	In-depth	Required when relevant to the type(s)	Required (3-year cycle)	In-depth
Case- studies	In-depth	Required when relevant to the type(s)	In-depth	In-depth

AMC2 ORO.CC.115(e) Conduct of training courses and associated checking

CREW RESOURCE MANAGEMENT (CRM) TRAINING — SINGLE CABIN CREW OPERATIONS

For single cabin crew operations, AMC1 ORO.CC.115(e) should be applied with the following differences:

(a) Relevant training elements

CRM training should focus on the elements specified in Table 1 of (g) of AMC1 ORO.CC.115(e) which are relevant to single cabin crew operations. Therefore, single cabin crew CRM training should include, among others:

(1) situation awareness;

(2) workload management;

(3) decision-making;

(4) resilience development;

(5) surprise and startle effect; and

(6) effective communication and coordination with

(i) the flight crew; and

(ii) other operational personnel and ground services.

(b) Virtual classroom training

Notwithstanding (a)(2)of AMC1 ORO.CC.115(e), classroom training may take place remotely, using a videoconferencing tool for a cabin crew member operating on aircraft with a maximum operational passenger seating configuration of 19 or less. The tool should permit real-time interaction between the trainees and the trainer, including speech and elements of body language. It should also be capable of transmitting any document to the trainee that the trainer wishes to present. The CRM trainer should establish the list of trainees in advance. Their number should be limited to 6 to ensure a sufficient level of interaction during the training session.

AMC3 ORO.CC.115(e) Conduct of training courses and associated checking

CABIN CREW CRM TRAINER

(a) Applicability

The provisions described herein:

(1) should be fulfilled by cabin crew CRM trainers responsible for classroom CRM training; and

(2) are not applicable to trainers or instructors conducting training other than CRM training, but integrating CRM elements into this training. Nevertheless, trainers or instructors who are integrating CRM elements into the aircraft type training, recurrent training or senior cabin crew member training should have acquired relevant knowledge of human performance and limitations, and have completed appropriate CRM training.

(b) Qualification of cabin crew CRM trainer

(1) A training and standardisation programme for cabin crew CRM trainers should be established.

(2) The cabin crew CRM trainer, in order to be suitably qualified, should:

(i) have adequate knowledge of the relevant flight operations;

(ii) have received instructions on human performance and limitations (HPL);

(iii) have completed an introductory CRM course, as required in Part-CC, and an operator's CRM training, as specified in AMC1 ORO.CC.115(e);

(iv) have received training in group facilitation skills;

(v) have received additional training in the fields of group management, group dynamics and personal awareness; and

(vi) have demonstrated the knowledge, skills and credibility required to train the CRM training elements in the non-operational environment, as specified in Table 1 of AMC1 ORO.CC.115(e).

(3) An experienced CRM trainer may become a cabin crew CRM trainer if he/she demonstrates a satisfactory knowledge of the relevant flight operations and the cabin crew working environment, and fulfils the provisions specified in (2)(ii) to (2)(vi).

(c) Training of cabin crew CRM trainer

(1) Training of cabin crew CRM trainers should be both theoretical and practical. Practical elements should include the development of specific trainer skills, particularly the integration of CRM into day-to-day operations.

(2) The basic training of cabin crew CRM trainers should include the training elements for cabin crew, as specified in Table 1 of AMC1 ORO.CC.115(e). In addition, the basic training should include the following:

(i) introduction to CRM training;

(ii) operator's management system; and

(iii) characteristics, as applicable:

(A) of the different types of CRM trainings (initial, recurrent, etc.);

(B) of combined training; and

(C) related to the type of aircraft or operation.

(3) The refresher training of cabin crew CRM trainers should include new methodologies, procedures and lessons learned.

(4) The training of cabin crew CRM trainers should be conducted by cabin crew CRM trainers with a minimum of 3 years' experience. Assistance may be provided by experts in order to address specific areas.

(d) Assessment of cabin crew CRM trainer

(1) A cabin crew CRM trainer should be assessed by the operator when conducting the first CRM training course. This first assessment should be valid for a period of 3 years.

(2) Assessment is the process of observing, recording, interpreting and debriefing the cabin crew CRM trainer. The operator should describe the assessment process in the operations manual. All personnel involved in the assessment must be credible and competent in their role.

(e) Recency and renewal of qualification as cabin crew CRM trainer

(1) For recency of the 3-year validity period, the cabin crew CRM trainer should:

(i) conduct at least 2 CRM training events in any 12-month period;

(ii) be assessed within the last 12 months of the 3-year validity period by the operator; and

(iii) complete CRM trainer refresher training within the 3-year validity period.

(2) The next 3-year validity period should start at the end of the previous period.

(3) For renewal, i.e. when a cabin crew CRM trainer does not fulfil the provisions of (1), he/she should, before resuming as cabin crew CRM trainer:

(i) comply with the qualification provisions of (b) and (d); and

(ii) complete CRM trainer refresher training.

GM1 ORO.CC.115(e) Conduct of training courses and associated checking

CRM – GENERAL

(a) CRM is the effective utilisation of all available resources (e.g. crew members, aircraft systems, and supporting facilities) to achieve safe and efficient operation.

(b) The objective of CRM is to enhance the communication and management skills of the crew member, as well as the importance of effective coordination and two-way communication between all crew members.

GM2 ORO.CC.115(e) Conduct of training courses and associated checking

MINIMUM TRAINING TIMES

(a) The following minimum training times are appropriate:

(1) multi cabin crew operations:

(i) combined CRM training: 6 training hours over a period of 3 years; or, for EBT operators which have implemented a competency framework for cabin crew (e.g. ICAO PANS-TRG), a minimum of 3 training hours within 3 years; and

(ii) operator's CRM training: 6 training hours;

(2) operator's CRM training for single cabin crew operations: 4 training hours for a cabin crew member operating on aircraft with a maximum operational passenger seating configuration of 19 or less;

(3) cabin crew CRM trainer:

(i) basic training:

(A) 18 training hours when the operator can justify that the trainee already has received sufficient and suitable instruction on training skills in order to conduct CRM training courses; or

(B) 30 training hours for trainees not fulfilling (A); and

(ii) refresher training: 6 training hours.

(b) 'Training hours' means actual training time excluding breaks.

GM3 ORO.CC.115(e) Conduct of training courses and associated checking

DESIGN, IMPLEMENTATION AND EVALUATION OF CRM TRAINING

The checklist in Table 1 provides guidance on the design, implementation and evaluation of CRM training, and on their incorporation into the operator's safety culture. Elements of the operator's management systems and the competency-based approach are incorporated in the checklist.

Table 1 — Checklist for design, implementation, evaluation and incorporation of CRM training

Step No	Description	Element
1	Needs analysis	Determine the necessary CRM competencies
		Develop CRM training goals
		Ensure the organisation is ready for CRM training
2	Design	Develop CRM training objectives
		Determine what to measure and how to measure it
3	Development	Describe the CRM learning environment
		Develop full-scale prototype of training
		Validate and modify CRM training
4	Implementation	Prepare trainees and environment
		Set a climate for learning (e.g. practice and feedback)

		Implement the CRM training programme
5	Evaluation	Determine training effectiveness
		Evaluate CRM training at multiple levels
		Revise the CRM training programme to improve effectiveness
6	Incorporation	Establish an environment where CRM training is positively recognised
		Reinforce CRM behaviours in daily work
		Provide recurrent CRM training

GM4 ORO.CC.115(e) Conduct of training courses and associated checking

RESILIENCE DEVELOPMENT

(a) The main aspects of resilience development can be described as the ability to:

(1) learn ('knowing what has happened');

(2) monitor ('knowing what to look for');

(3) anticipate ('finding out and knowing what to expect'); and

(4) respond ('knowing what to do and being capable of doing it').

(b) Operational safety is a continuous process of evaluation of and adjustment to existing and future conditions. In this context, and following the description in (a), resilience development involves an ongoing and adaptable process including situation assessment, self-review, decision and action. Training on resilience development enables crew members to draw the right conclusions from both positive and negative experiences. Based on those experiences, crew members are better prepared to maintain or create safety margins by adapting to dynamic complex situations.

(c) The training topics in (f)(1) of AMC1 ORO.CC.115(e) are to be understood as follows:

(1) Mental flexibility

(i) The phrase 'understand that mental flexibility is necessary to recognise critical changes' means that crew members are prepared to respond to situations for which there is no set procedure.

(ii) The phrase 'reflect on their judgement and adjust it to the unique situation' means that crew members learn to review their judgement based on the unique characteristics of the given circumstances.

(iii) The phrase 'avoid fixed prejudices and over-reliance on standard solutions' means that crew members learn to update solutions and standard response sets, which have been formed on prior knowledge.

(iv) The phrase 'remain open to changing assumptions and perceptions' means that crew members constantly monitor the situation, and are prepared to adjust their understanding of the evolving conditions.

(2) Performance adaptation

(i) The phrase 'mitigate frozen behaviours, overreactions and inappropriate hesitation' means that crew members correct improper actions with a balanced response.

(ii) The phrase 'adjust actions to current conditions' means that crew members' responses are in accordance with the actual situation.

GM5 ORO.CC.115(e) Conduct of training courses and associated checking

CABIN CREW CRM TRAINER ASSESSMENT

(a) For assessing cabin crew CRM trainers, the operator may nominate experienced cabin crew CRM trainers who have demonstrated continued compliance with the provisions for a cabin crew CRM trainer and capability in that role for at least 3 years.

(b) An operator that does not have the resources to conduct the assessment may employ a contractor. The standard as regards the assessment is confirmed on a 3-year basis by the operator.

(c) The checklist in Table 1 provides guidance on the assessment of a cabin crew CRM trainer. If a cabin crew CRM trainer is competent in his/her role, the response to the questions in Table 1 should be 'yes'. When answering the questions in Table 1, justifications and examples related to the responses given should be provided.

Table 1 — Cabin crew CRM trainer assessment checklist

Questions to assess a cabin crew CRM trainer	**Response yes/no**
Did the CRM trainer demonstrate the knowledge required for the role?	
Did the CRM trainer support CRM concepts?	
Did the CRM trainer encourage trainees to participate, share their experiences and self- analyse?	
Did the CRM trainer identify and respond to the trainees' needs relative to expertise/experience?	
Did the CRM trainer show how CRM is integrated in technical training?	
Did the CRM trainer incorporate company CRM standards when appropriate?	
Did the CRM trainer identify and discuss the non-technical reasons involved in accidents, incidents and events included in case studies?	
Did the CRM trainer regularly check for understanding and resolve ambiguities?	
Did the CRM trainer demonstrate effective instruction and facilitation skills?	

GM6 ORO.CC.115(e) Conduct of training courses and associated checking

CRM TRAINING — VIRTUAL CLASSROOM TRAINING — SINGLE-CABIN CREW OPERATIONS OF AIRCRAFT WITH AN MOPSC OF 19 OR LESS

(a) A successful virtual classroom training relies on the ability of the trainer to make best use of the associated technologies in the context of CRM training. The cabin crew CRM trainer may need to receive appropriate training covering the following:

(1) learning style;

(2) teaching method associated with virtual classroom instruction, such as videoconferencing, and a familiarisation with the virtual classroom instruction system in use, including management of time, training media and equipment and tools.

(b) The requirement of ORO.GEN.140 for the operator to grant access to the competent authority also applies to the virtual classroom training.

(c) More information on virtual classroom training is provided in the EASA Guidance for allowing virtual classroom instruction and distance learning.

AMC1 ORO.CC.120(a)(1) Initial training course

NEW ENTRANTS IN OPERATIONS OTHER THAN CAT OPERATIONS

(a) When a new entrant to an operator conducting operations other than CAT is a cabin crew member, not holding a valid cabin crew attestation, who has already acquired experience as cabin crew in operations other than CAT, credit may be granted to the elements of the initial training programme he/she has previously completed if such training elements are documented in his/her training records.

(b) In such a case, the operator should ensure that:

(1) the full training programme, as specified in Appendix 1 to Part-CC, has been covered, and

(2) the new entrant successfully undergoes the examination required by ORO.CC.120 (a)(2).

AMC1 ORO.CC.125(c) Aircraft type specific training and operator conversion training

TRAINING PROGRAMME — AIRCRAFT TYPE SPECIFIC TRAINING

The following aircraft type specific training elements should be covered as relevant to the aircraft type:

(a) Aircraft description

(1) type of aircraft, principal dimensions, narrow or wide bodied, single or double deck;

(2) speed, altitude, range;

(3) passenger seating capacity;

(4) flight crew number and minimum number of required cabin crew;

(5) cabin doors/exits location and sill height;

(6) cargo and unpressurised areas as relevant;

(7) aircraft systems relevant to cabin crew duties;

(8) flight crew compartment — general presentation, pilot seats and their mechanism, emergency exits, storage;

(9) required cabin crew stations;

(10) flight crew compartment security — general: door components and use;

(11) access to avionics bay where relevant;

(12) lavatories — general: doors, systems, calls and signs; and

(13) least risk bomb location.

(b) Safety and emergency equipment and aircraft systems installed

Each cabin crew member should receive realistic training on, and demonstration of, the location and use of all aircraft type specific safety and emergency equipment and aircraft systems installed, with emphasis on the following:

(1) slides, and where non-self-supporting slides are carried, the use of any associated assisting evacuation means;

(2) life-rafts and slide-rafts, including the equipment attached to, and/or carried in, the raft;

(3) drop-out oxygen system; and

(4) communication equipment.

(c) Operation of doors and exits

This training should be conducted in a representative training device or in the actual aircraft and should include failure of power assist systems where fitted and the action and forces required to operate and deploy evacuation slides. Training should also include operation and actual opening of the flight crew compartment security door when installed.

(d) Fire and smoke protection equipment

Each cabin crew member should be trained in using fire and/or smoke protection equipment where fitted.

(e) Evacuation slide training

(1) Each cabin crew member should descend an evacuation slide from a height representative of the aircraft main deck sill height.

(2) The slide should be fitted to a representative training device or to the actual aircraft.

(3) A further descent should be made when the cabin crew member qualifies on an aircraft type in which the main deck exit sill height differs significantly from any aircraft type previously operated.

(f) Operation of equipment related to pilot incapacitation

The training should cover any type specific elements or conditions relevant to cabin crew actions to be taken in case of pilot incapacitation. Each cabin crew member should be trained to operate all equipment that must be used in case of pilot incapacitation.

AMC1 ORO.CC.125(d) Aircraft type specific training and operator conversion training

TRAINING PROGRAMME — OPERATOR CONVERSION TRAINING

The following training elements should be covered as relevant to the aircraft type and the related operator's specifics:

(a) Description of the cabin configuration

The description should cover all elements specific to the operator's cabin configuration and any differences with those previously covered in accordance with AMC1 ORO.CC.125 (c), including:

(1) required and additional cabin crew stations — location (including direct view), restraint systems, control panels;

(2) passenger seats — general presentation and associated operator's specific features and equipment;

(3) designated stowage areas;

(4) lavatories — operator's specific features, equipment and systems additional to the aircraft type specific elements;

(5) galley – location, appliances, water and waste system, including shut-off sinks, drains, stowage, control panels, call and signs,

and where applicable

(6) crew rest areas — location, systems, controls, safety and emergency equipment;

(7) cabin dividers, curtains, partitions;

(8) lift location, use, controls;

(9) stowage for the containment of waste;

(10) passenger hand rail system or alternative means; and

(11) in-flight entertainment (IFE) system, if installed (e.g. central system or hand-held device(s) such as PEDs for the use by passenger(s) as applicable) and its safety aspects.

(b) Safety and emergency equipment

Each cabin crew member should receive realistic training on and demonstration of the location and use of all safety and emergency equipment carried, including:

(1) life jackets, infant life jackets and flotation devices;

(2) first-aid and drop-out oxygen, including supplementary systems;

(3) fire extinguishers and protective breathing equipment (PBE);

(4) crash axe or crowbar;

(5) emergency lights including torches;

(6) communication equipment, including megaphones;

(7) slide rafts and life rafts' survival packs and their contents;

(8) pyrotechnics (actual or representative devices);

(9) first-aid kits, emergency medical kits and their contents; and

(10) other portable safety and emergency equipment, where applicable.

(c) Normal and emergency procedures

Each cabin crew member should be trained on the operator's normal and emergency procedures as applicable, with emphasis on the following:

(1) passenger briefing, safety demonstration and cabin surveillance;

(2) severe air turbulence;

(3) non–pressurisation, slow and sudden decompression, including the donning of portable oxygen equipment by each cabin crew member; and

(4) other in-flight emergencies; and

(5) carriage of special categories of passengers (SCPs).

(d) Passenger handling and crowd control

Training should be provided on the practical aspects of passenger preparation and handling, as well as crowd control, in various emergency situations as applicable to the operator's specific aircraft cabin configuration, and should cover the following:

(1) communications between flight crew and cabin crew and use of all communications equipment, including the difficulties of coordination in a smoke- filled environment;

(2) verbal commands;

(3) the physical contact that may be needed to encourage people out of a door/exit and onto a slide;

(4) redirection of passengers away from unusable doors/exits;

(5) marshalling of passengers away from the aircraft;

(6) evacuation of special categories of passengers with emphasis on passengers with disabilities or reduced mobility; and

(7) authority and leadership.

(e) Fire and smoke training

(1) Each cabin crew member should receive realistic and practical training in the use of all fire-fighting equipment, including protective clothing representative of that carried in the aircraft.

(2) Each cabin crew member should:

(i) extinguish an actual fire characteristic of an aircraft interior fire except that, in the case of halon extinguishers, an alternative extinguishing agent may be used; and

(ii) exercise the donning and use of PBE in an enclosed simulated smoke- filled environment with particular emphasis on identifying the actual source of fire and smoke.

(f) Evacuation procedures

Training should include all the operator's procedures that are applicable to planned or unplanned evacuations on land and water. It should also include, where relevant, the additional actions required from cabin crew members responsible for a pair of doors/exits and the recognition of when doors/exits are unusable or when evacuation equipment is unserviceable.

(g) Pilot incapacitation procedures

Unless the minimum flight crew is more than two, each cabin crew member should be trained in the procedure for pilot incapacitation. Training in the use of flight crew checklists, where required by the operator's standard operating procedures (SOPs), should be conducted by a practical demonstration.

(h) CRM

(1) The operator should ensure that all applicable CRM training elements, as specified in Table 1 of AMC1 ORO.CC.115(e), are covered to the level required in the column 'Operator aircraft type conversion training'.

(2) The operator's CRM training and CRM training covered during operator aircraft type conversion training should be conducted by at least one cabin crew CRM instructor.

AMC1 ORO.CC.125 & ORO.CC.130 Aircraft type specific training and operator conversion training & differences training

TRAINING PROGRAMMES

The programmes and syllabi of aircraft type specific training, operator conversion training and differences training should take into account the cabin crew member's previous training as documented in his/her training records.

AMC1 ORO.CC.125(b) & ORO.CC.130(c) Aircraft type specific training and operator conversion training & differences training

NON-MANDATORY (RECOMMENDATIONS) ELEMENTS OF OPERATIONAL SUITABILITY DATA

When developing the training programmes and syllabi for aircraft-type specific training and for differences training, the operator should consider the non-mandatory (recommendations) elements for the relevant type that are provided in the operational suitability data established in accordance with Part 21.

AMC1 ORO.CC.135 Familiarisation

FAMILIARISATION FLIGHTS AND AIRCRAFT FAMILIARISATION VISITS

(a) For CAT operations, familiarisation of cabin crew to a new aircraft type or variant should be completed in accordance with the following, as relevant:

(1) New entrant cabin crew

Each new entrant cabin crew member having no previous comparable operating experience should participate in:

(i) a familiarisation visit, as described in (c), to the aircraft to be operated; and

(ii) familiarisation flights, as described in (b).

(2) Cabin crew operating on a subsequent aircraft type

A cabin crew member assigned to operate on a subsequent aircraft type with the same operator should participate either in:

(i) a familiarisation flight, as described in (b); or

(ii) a familiarisation visit, as described in (c), to the aircraft type to be operated.

(b) Familiarisation flights

(1) During familiarisation flights, the cabin crew member should be assigned in addition to the minimum number of cabin crew required in accordance with ORO.CC.100 and if applicable ORO.CC.200.

(2) Familiarisation flights should be:

(i) conducted under the supervision of the senior cabin crew member;

(ii) structured and conducted with the cabin crew member participating in preflight, in-flight and post-flight safety duties;

(iii) operated with the cabin crew member wearing the operator's cabin crew uniform; and

(iv) recorded in the training record of the cabin crew member.

(c) Aircraft familiarisation visits

(1) Aircraft visits should enable the cabin crew member to become familiar with the aircraft environment and its equipment. Accordingly, aircraft visits should be conducted by appropriately qualified persons. The aircraft visit should provide an overview of the aircraft's exterior, interior and aircraft systems with emphasis on the following:

(i) interphone and public address systems;

(ii) evacuation alarm systems;

(iii) emergency lighting;

(iv) smoke detection systems;

(v) safety and emergency equipment;

(vi) flight crew compartment;

(vii) cabin crew stations;

(viii) lavatories;

(ix) galleys, galley security and water shut-off;

(x) cargo areas if accessible from the passenger compartment during flight;

(xi) circuit breaker panels located in the passenger compartment;

(xii) crew rest areas;

(xiii) doors/exits location and environment; and

(xiv) IFE system used for conveying safety-related information.

(2) An aircraft familiarisation visit may be combined with the aircraft type specific training or operator conversion training required by ORO.CC.125.

(d) For cabin crew members assigned to operations other than CAT, familiarisation should be completed by means of an aircraft familiarisation visit, or a familiarisation flight, as appropriate taking into account the aircraft type to be operated by the cabin crew member.

AMC1 ORO.CC.140 Recurrent training

TRAINING PROGRAMMES

(a) Elements of the annual recurrent training programme

(1) Training on the location and handling of safety and emergency equipment should include all relevant oxygen systems, and any equipment such as defibrillators if carried on board.

(2) Training on emergency procedures should cover pilot incapacitation procedures and crowd control techniques.

(3) CRM training should satisfy the following:

(i) the applicable training elements specified in Table 1 of AMC1 ORO.CC.115 (e) should be covered within a 3-year cycle to the level required by Column 'Annual Recurrent Training';

(ii) the definition and implementation of the CRM training programme should be managed by a cabin crew CRM trainer; and

(iii) when CRM training is provided by stand-alone modules, it should be conducted by at least one cabin crew CRM trainer.

(b) Additional triennial elements of recurrent training programme

(1) Training on the operation of normal and emergency doors/exits should cover failure of power assist systems where fitted. This should include the actions and forces required to operate and deploy evacuation slides, and additional training when relevant for cabin crew members responsible for a pair of doors/exits.

(2) Training in the use of all firefighting equipment, including protective clothing, representative of that carried in the aircraft should include individual practice by each cabin crew member to extinguish a fire characteristic of an aircraft interior fire except that, in the case of halon extinguishers, an alternative extinguishing agent may be used. Training should place particular emphasis on identifying the actual source of fire or smoke.

(3) Training on normal and emergency procedures for special categories of passengers (SCPs) should cover the specific procedures established by the operator for the carriage of SCPs. The operator may determine that such training is to be completed at shorter intervals, taking into account the route structure, passenger profiles, aircraft types operated, seasonal demands and operations.

AMC1 ORO.CC.145 Refresher training

TRAINING PROGRAMME

(a) Training on emergency procedures should include pilot incapacitation procedures and crowd control techniques as applicable to the aircraft type; and

(b) Operation of doors and exits by each cabin crew member should include failure of power assist systems where fitted as well as the action and forces required to operate and deploy evacuation slides.

GM1 ORO.CC.145 Refresher training

FREQUENCY OF REFRESHER TRAINING

For aircraft with complex equipment or procedures, the operator should consider the need for refresher training to be completed by cabin crew members who have been absent from flying duties for less than 6 months.

Section 2 - Additional requirements for Commercial Air Transport Operations

AMC1 ORO.CC.200(c) Senior cabin crew member

TRAINING PROGRAMME

The senior cabin crew member training course should at least cover the following elements:

(a) Pre-flight briefing:

(1) operating as a crew;

(2) allocation of cabin crew stations and responsibilities; and

(3) consideration of the particular flight, aircraft type, equipment, area and type of operation, including extended range operations with two-engine aeroplanes (ETOPS) and special categories of passengers with emphasis on passengers with disabilities or reduced mobility, infants and stretcher cases.

(b) Cooperation within the crew:

(1) discipline, responsibilities and chain of command;

(2) importance of coordination and communication; and

(3) pilot incapacitation.

(c) Review of operator requirements and legal requirements:

(1) passenger briefing, safety briefing cards;

(2) securing of galleys;

(3) stowage of cabin baggage;

(4) electronic equipment;

(5) procedures when fuelling with passengers on board;

(6) turbulence; and

(7) documentation.

(d) Accident and incident reporting.

(e) Human factors and CRM:

The operator should ensure that all applicable elements specified in Table 1 of AMC1 ORO.CC.115 (e) are integrated into the training and covered to the level required by Column 'Senior Cabin Crew Course'.

(1) Flight and duty time limitations and rest requirements (FTL).

AMC1 ORO.CC.200(d) Senior cabin crew member

RESPONSIBILITY TO THE COMMANDER

When the level of turbulence so requires, and in the absence of any instructions from the flight crew, the senior cabin crew member should be entitled to discontinue non-safety- related duties and advise the flight crew of the level of turbulence being experienced and the need for the fasten seat belt signs to be switched on. This should be followed by the cabin crew securing the passenger cabin and other relevant areas.

AMC1 ORO.CC.200(e) Senior cabin crew member

UNABLE TO OPERATE

(a) Replacement of senior cabin crew member at a base of the operator

A senior cabin crew member who did not report for or cannot commence the assigned flight or series of flights originating from a base of the operator should be replaced without undue delay. The flight should not depart unless another senior cabin crew member has been assigned.

(b) Replacement of incapacitated or unavailable senior cabin crew member

(1) A senior cabin crew member, who becomes incapacitated during a flight or series of flights, or unavailable at a stopover (layover) point, should be replaced without undue delay by another senior cabin crew member qualified on the concerned aircraft type/variant. If there is no other senior cabin

crew member, the most appropriately qualified cabin crew member should be assigned to act as senior cabin crew member in order to reach a base of the operator.

(2) If during the series of flights the aircraft transits via a base of the operator, the assigned cabin crew member acting as senior cabin crew member should be replaced by another senior cabin crew member.

AMC2 ORO.CC.200(e) Senior cabin crew member

MOST APPROPRIATELY QUALIFIED CABIN CREW MEMBER

Selection of the most appropriately qualified cabin crew member should take into account if the individual's experience as operating cabin crew member is adequate for the conduct of duties required of a senior cabin crew member. The selected cabin crew member should have operational experience on the concerned aircraft type/variant.

GM1 ORO.CC.200(e) Senior cabin crew member

REPLACEMENT OF INCAPACITATED OR UNAVAILABLE SENIOR CABIN CREW MEMBER BY ANOTHER SENIOR CABIN CREW MEMBER

To ensure that another senior cabin crew member is assigned without undue delay, the operator should take appropriate measures. These include, but are not limited to, the following:

(a) to ensure that a flight or series of flights do not depart from an aerodrome where a senior cabin crew member is available or can be made available, the operator may:

(1) appoint a senior cabin crew member originally assigned to another flight and who is available at the concerned base or stopover (layover) point if the reporting time for that flight provides sufficient time to find a replacement; or

(2) assign a senior cabin crew member who is on standby to operate the flight or to position to the destination where the nominated senior cabin crew member has become incapacitated or unavailable to operate;

(b) the operator should utilise another senior cabin crew member if she/he is among the operating crew on the same flight;

(c) in case of unavailable senior cabin crew member, the operator should use the available time and resources to replace him/her at the stopover (layover) point with another senior cabin crew member;

(d) the operator should consider including the identification of the most appropriately qualified cabin crew member in pre-flight briefings.

GM2 ORO.CC.200(e) Senior cabin crew member

FLIGHT OR SERIES OF FLIGHT

Flight or series of flights refers to a period that commences when a cabin crew member is required to report for duty, which includes a sector or a series of sectors, and finishes when the aircraft finally comes to rest and the engines are shut down, at the end of the last sector on which the cabin crew member acts as an operating crew member.

GM1 ORO.CC.205(a) Reduction of the number of cabin crew members during ground operations and in unforeseen circumstances

CABIN CREW PRESENT AND READY TO ACT

'Present and ready to act' means that cabin crew members should be awake and in a state of alertness that enables them to fulfil their responsibilities and perform their duties as required by any situation in accordance with all applicable normal and emergency procedures established in the operations manual.

GM1 ORO.CC.205(b)(2) Reduction of the number of cabin crew during ground operations and in unforeseen circumstances

UNFORESEEN CIRCUMSTANCES

Unforeseen circumstances in this context refer to incapacitation and unavailability of a senior cabin crew member or a cabin crew member as follows:

(a) 'Incapacitation' means a sudden degradation of medical fitness that occurs during flight duty period either in-flight or during a flight transit of the same flight duty period away from operator's base and that precludes the senior cabin crew member or cabin crew member from performing his/her duties. Incapacitation prior to dispatch of the aircraft from a base of the operator does not substantiate a reduction of the cabin crew complement below the minimum required.

(b) 'Unavailability' means circumstances at a stopover (layover) destination that preclude the senior cabin crew member or cabin crew member from reporting for the flight duty period, such as traffic jams that prevent the senior cabin crew member or cabin crew member from presenting himself/herself at the crew pick-up point in time, difficulties with local authorities, health problems, death, etc. Unavailability does not refer to insufficient number or absence of cabin crew members on standby, or absence from work due to pregnancy, maternity/paternity leave, parental leave, medical leave, sick leave, or any other absence from work.

AMC1 ORO.CC.205(c)(1) Reduction of the number of cabin crew members during ground operations and in unforeseen circumstances

PROCEDURES WITH REDUCED NUMBER OF CABIN CREW

(a) During ground operations, if reducing the applicable minimum required number of cabin crew, the operator should ensure that the procedures required by ORO.CC.205 (c)(1) specify that:

(1) electrical power is available on the aircraft;

(2) a means of initiating an evacuation is available to the senior cabin crew member or at least one member of the flight crew is in the flight crew compartment;

(3) cabin crew stations and associated duties are specified in the operations manual; and

(4) cabin crew remain aware of the position of servicing and loading vehicles at and near the exits.

(5) Additionally, in the case of passengers' embarkation:

(6) the senior cabin crew member should have performed the pre-boarding safety briefing to the cabin crew; and

(7) the pre-boarding cabin checks should have been completed.

(b) If, in unforeseen circumstances, the number of cabin crew members is reduced below the applicable minimum required number, for example in the event of incapacitation or unavailability of cabin crew, the procedures established for this purpose in the operations manual should take into consideration at least the following:

(1) reduction of passenger numbers;

(2) reseating of passengers with due regard to doors/exits and other applicable limitations; and

(3) relocation of cabin crew taking into account the factors specified in AMC1 ORO.CC.100 and any change of procedures.

AMC1 ORO.CC.205(d) Reduction of the number of cabin crew members during ground operations and in unforeseen circumstances

RISK ASSESSMENT FOR CRUISE PHASE OPERATION WITH A LOWER NUMBER OF CABIN CREW MEMBERS

When conducting the risk assessment required under ORO.CC.205(d), the operator should:

(a) assess the risks as relevant to the type and duration of the flight to be operated, aeroplane type, cabin configuration, passenger seating capacity, the number and qualification of the operating cabin crew members, and the particular flight duty period (FDP);

(b) determine how many cabin crew members should be present and ready to act at any time to realistically manage the normal and emergency procedures to be applied during cruise; and

(c) evaluate the time and conditions necessary for the cabin crew members taking in-flight rest to reach their assigned cabin crew stations in case of an emergency.

AMC2 ORO.CC.205(d) Reduction of the number of cabin crew members during ground operations and in unforeseen circumstances

SPECIFIC PROCEDURES FOR CRUISE PHASE OPERATION WITH A LOWER NUMBER OF CABIN CREW MEMBERS IN THE PASSENGER COMPARTMENT

(a) When establishing the specific procedures for cruise phase operation with a lower number of cabin crew members in the passenger compartment, the operator should at least consider the following:

(1) Normal procedures including at least:

(i) surveillance of the passenger compartment, including the lavatories and the galleys;

(ii) management of, and assistance to, passengers;

(iii) crew communication and coordination, including the necessary contact with and support to the flight crew as specified by the operator.

(2) Emergency procedures including at least those to be applied in case of:

(i) medical emergency;

(ii) unruly behaviour;

(iii) unlawful interference or bomb threat;

(iv) slow depressurisation;

(v) decompression;

(vi) fire or smoke event;

(vii) emergency descent, taking into account that the procedure to be applied may vary depending on the causing event (e.g. depressurisation or fire).

(b) Specific procedures for cruise phase operation with a lower number of cabin crew should describe:

(1) how to re-assign duties and responsibilities of cabin crew members or senior crew members who take in-flight rest to another cabin crew member considering the experience and qualification of the cabin crew member or senior cabin crew member; and

(2) how cabin crew members taking in-flight rest can be again ready to act and reach their assigned cabin crew stations in case of an emergency.

GM1 ORO.CC.210(d) Additional conditions for assignment to duties

OPERATOR'S CABIN CREW UNIFORM

The uniform to be worn by operating cabin crew should be such as not to impede the performance of their duties, as required for the safety of passengers and flight during operations, and should allow passengers to identify the operating cabin crew including in an emergency situation.

GM1 ORO.CC.215(b)(2) Training and checking programmes and related documentation

LIST OF AIRCRAFT TYPE/VARIANT QUALIFICATION(S)

When providing the updated validity list of aircraft type/variant qualifications to cabin crew members having successfully completed a training course and the associated checking, the operator may use the following format. If using another format, at least the elements in (a) to (d) and in columns (1) and (2) should be indicated to show validity of qualification(s).

Cabin crew aircraft type/variant qualification(s)							
(a)	Reference number of the cabin crew attestation:						
(b)	Cabin crew attestation holder's full name The above-mentioned person may act as an operating cabin crew member during flight operations only if his/her aircraft type and/or variant qualification(s) listed below, and dated DD/MM/YYYY, comply with the applicable validity period(s) specified in Part-ORO.						
(c)	Issuing organisation: (name, postal address, AOC and/or approval reference number and stamp or logo)						
(d)	Date of issue: (DD/MM/YYYY)						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Qualification valid until	Aircraft type specific training	Operator conversion training	Differences training *If relevant*	Familiari-sation	Last recurrent training	Refresher training *If relevant*
A/C type 1							
Variant							
A/C type 2							

Variant							
A/C type 3							
Variant							
If approved A/C type 4							
Variant							

AMC1 ORO.CC.250(b) Operation on more than one aircraft type or variant

DETERMINATION OF AIRCRAFT TYPES AND VARIANTS

(a) When determining similarity of location and type of portable safety and emergency equipment, the following factors should be assessed:

(1) all portable safety and emergency equipment is stowed in the same, or in exceptional circumstances, in substantially the same location;

(2) all portable safety and emergency equipment requires the same method of operation;

(3) portable safety and emergency equipment includes:

(i) fire-fighting equipment;

(ii) protective breathing equipment (PBE);

(iii) oxygen equipment;

(iv) crew life-jackets;

(v) torches;

(vi) megaphones;

(vii) first-aid equipment;

(viii) survival and signalling equipment; and

(ix) other safety and emergency equipment, where applicable.

(b) The type-specific emergency procedures to be considered should include at least the following:

(1) land and water evacuation;

(2) in-flight fire;

(3) non-pressurisation, slow and sudden decompression; and

(4) pilot incapacitation.

(c) When determining similarity of doors/exits in the absence of operational suitability data established in accordance with Part 21 for the relevant aircraft type(s) or variant(s), the following factors should be assessed, except for self-help exits, such as type III and type IV exits, that need not be included in the assessment:

(1) door/exit arming and disarming;

(2) direction of movement of the operating handle;

(3) direction of door/exit opening;

(4) power assist mechanisms; and

(5) assisting evacuation means.

GM1 ORO.CC.250 Operation on more than one aircraft type or variant

SAFETY BRIEFING FOR CABIN CREW

When changing aircraft type or variant during a series of flight sectors, the cabin crew safety briefing should include a representative sample of type-specific normal and emergency procedures and safety and emergency equipment applicable to the actual aircraft to be operated for the immediately subsequent flight sector.

Subpart TC - Technical Crew in HEMS, HHO or NVIS Operations

GM1 ORO.TC.105 Conditions for assignment to duties

GENERAL

(a) The technical crew member in HEMS, HHO or NVIS operations should undergo an initial medical examination or assessment and, if applicable, a re-assessment before undertaking duties.

(b) Any medical assessment or re-assessment should be carried out according to best aero-medical practice by a medical practitioner who has sufficiently detailed knowledge of the applicant's medical history.

(c) The operator should maintain a record of medical fitness for each technical crew member.

(d) Technical crew members should:

(1) be in good health;

(2) be free from any physical or mental illness that might lead to incapacitation or inability to perform crew duties;

(3) have normal cardio-respiratory function;

(4) have normal central nervous system;

(5) have adequate visual acuity 6/9 with or without glasses;

(6) have adequate hearing; and

(7) have normal function of ear, nose and throat.

AMC1 ORO.TC.110 Training and checking

GENERAL

(a) Elements of training that require individual practice may be combined with practical checks.

(b) The checks should be accomplished by the method appropriate to the type of training including:

(1) practical demonstration;

(2) computer-based assessment;

(3) in-flight checks; and/or

(4) oral or written tests.

AMC1 ORO.TC.110(a) Training and checking

CRM TRAINING

The technical crew training programme for initial, operator conversion and recurrent training should include relevant CRM training elements as specified in AMC1 ORO.FC.115.

AMC1 ORO.TC.115 Initial training

ELEMENTS

(a) The elements of initial training mentioned in ORO.TC.115 should include in particular:

(1) General theoretical knowledge on aviation and aviation regulations relevant to duties and responsibilities:

(i) the importance of crew members performing their duties in accordance with the operations manual;

(ii) continuing competence and fitness to operate as a crew member with special regard to flight and duty time limitations and rest requirements;

(iii) an awareness of the aviation regulations relating to crew members and the role of the Brunei DCA;

(iv) general knowledge of relevant aviation terminology, theory of flight, passenger distribution, meteorology and areas of operation;

(v) pre-flight briefing of the crew members and the provision of necessary safety information with regard to their specific duties;

(vi) the importance of ensuring that relevant documents and manuals are kept up-to-date with amendments provided by the operator;

(vii) the importance of identifying when crew members have the authority and responsibility to initiate an evacuation and other emergency procedures; and

(viii) the importance of safety duties and responsibilities and the need to respond promptly and effectively to emergency situations.

(2) Fire and smoke training:

(i) reactions to emergencies involving fire and smoke and identification of the fire sources;

(ii) the classification of fires and the appropriate type and techniques of application of extinguishing agents, the consequences of misapplication, and of use in a confined space; and

(iii) the general procedures of ground-based emergency services at aerodromes.

(3) When conducting extended overwater operations, water survival training, including the use of personal flotation equipment.

(4) Before first operating on an aircraft fitted with life-rafts or other similar equipment, training on the use of this equipment, including practice in water.

(5) Survival training appropriate to the areas of operation (e.g. polar, desert, jungle, sea or mountain).

(6) Aero-medical aspects and first aid, including:

(i) instruction on first aid and the use of first-aid kits; and

(ii) the physiological effects of flying.

(7) Effective communication between technical crew members and flight crew members, including common language and terminology.

AMC1 ORO.TC.120&.125 Operator conversion training and differences training

ELEMENTS

(a) Operator conversion training mentioned in ORO.TC.120 (b) and differences training mentioned in ORO.TC.125 (a) should include the following:

(1) Fire and smoke training, including practical training in the use of all firefighting equipment as well as protective clothing representative of that carried in the aircraft. Each technical crew member should:

(i) extinguish a fire characteristic of an aircraft interior fire except that, in the case of Halon extinguishers, an alternative extinguishing agent may be used; and

(ii) practise the donning and use of protective breathing equipment (when fitted) in an enclosed, simulated smoke-filled environment.

(2) Practical training on operating and opening all normal and emergency exits for passenger evacuation in an aircraft or representative training device and demonstration of the operation of all other exits.

(3) Evacuation procedures and other emergency situations, including:

(i) recognition of planned or unplanned evacuations on land or water — this training should include recognition of unusable exits or unserviceable evacuation equipment;

(ii) in-flight fire and identification of fire source; and

(iii) other in-flight emergencies.

(4) When the flight crew is more than one, training on assisting if a pilot becomes incapacitated, including a demonstration of:

(i) the pilot's seat mechanism;

(ii) fastening and unfastening the pilot's seat restraint system;

(iii) use of the pilot's oxygen equipment, when applicable; and

(iv) use of pilots' checklists.

(5) Training on, and demonstration of, the location and use of safety equipment, including the following:

(i) life rafts, including the equipment attached to, and/or carried in, the raft, where applicable;

(ii) life jackets, infant life jackets and flotation devices, where applicable;

(iii) fire extinguishers;

(iv) crash axe or crow bar;

(v) emergency lights, including portable lights;

(vi) communication equipment, including megaphones;

(vii) survival packs, including their contents;

(viii) pyrotechnics (actual or representative devices);

(ix) first-aid kits, their contents and emergency medical equipment; and

(x) other safety equipment or systems, where applicable.

(6) Training on passenger briefing/safety demonstrations and preparation of passengers for normal and emergency situations.

(7) Training on the use of dangerous goods, if applicable.

(8) Task-specific training.

AMC2 ORO.TC.120&.125 Operator conversion training and differences training

GENERAL

(a) The operator should determine the content of the conversion or differences training taking account of the technical crew member's previous training as documented in the technical crew member's training records.

(b) Aircraft conversion or differences training should be conducted according to a syllabus and include the use of relevant equipment and emergency procedures and practice on a representative training device or on the actual aircraft.

(c) The operator should specify in the operations manual the maximum number of types or variants that can be operated by a technical crew member.

AMC1 ORO.TC.120&.125 Operator conversion training and differences training

ELEMENTS

(a) Operator conversion training mentioned in ORO.TC.120 (b) and differences training mentioned in ORO.TC.125 (a) should include the following:

(1) Fire and smoke training, including practical training in the use of all firefighting equipment as well as protective clothing representative of that carried in the aircraft. Each technical crew member should:

(i) extinguish a fire characteristic of an aircraft interior fire except that, in the case of Halon extinguishers, an alternative extinguishing agent may be used; and

(ii) practise the donning and use of protective breathing equipment (when fitted) in an enclosed, simulated smoke-filled environment.

(2) Practical training on operating and opening all normal and emergency exits for passenger evacuation in an aircraft or representative training device and demonstration of the operation of all other exits.

(3) Evacuation procedures and other emergency situations, including:

(i) recognition of planned or unplanned evacuations on land or water — this training should include recognition of unusable exits or unserviceable evacuation equipment;

(ii) in-flight fire and identification of fire source; and

(iii) other in-flight emergencies.

(4) When the flight crew is more than one, training on assisting if a pilot becomes incapacitated, including a demonstration of:

(i) the pilot's seat mechanism;

(ii) fastening and unfastening the pilot's seat restraint system;

(iii) use of the pilot's oxygen equipment, when applicable; and

(iv) use of pilots' checklists.

(5) Training on, and demonstration of, the location and use of safety equipment, including the following:

(i) life rafts, including the equipment attached to, and/or carried in, the raft, where applicable;

(ii) life jackets, infant life jackets and flotation devices, where applicable;

(iii) fire extinguishers;

(iv) crash axe or crow bar;

(v) emergency lights, including portable lights;

(vi) communication equipment, including megaphones;

(vii) survival packs, including their contents;

(viii) pyrotechnics (actual or representative devices);

(ix) first-aid kits, their contents and emergency medical equipment; and

(x) other safety equipment or systems, where applicable.

(6) Training on passenger briefing/safety demonstrations and preparation of passengers for normal and emergency situations.

(7) Training on the use of dangerous goods, if applicable.

(8) Task-specific training.

AMC2 ORO.TC.120&.125 Operator conversion training and differences training

GENERAL

(a) The operator should determine the content of the conversion or differences training taking account of the technical crew member's previous training as documented in the technical crew member's training records.

(b) Aircraft conversion or differences training should be conducted according to a syllabus and include the use of relevant equipment and emergency procedures and practice on a representative training device or on the actual aircraft.

(c) The operator should specify in the operations manual the maximum number of types or variants that can be operated by a technical crew member.

AMC1 ORO.TC.135 Recurrent training

ELEMENTS

(a) The 12-month period mentioned in ORO.TC.135 (a) should be counted from the last day of the month when the first checking was made. Further training and checking should be undertaken within the last 3 calendar months of that period. The new 12- month period should be counted from the original expiry date.

(b) The recurrent practical training should include every year:

(1) emergency procedures, including pilot incapacitation;

(2) evacuation procedures;

(3) touch-drills by each technical crew member for opening normal and emergency exits for (passenger) evacuation;

(4) the location and handling of emergency equipment and the donning by each technical crew member of life jackets and protective breathing equipment (PBE), when applicable;

(5) first aid and the contents of the first-aid kit(s);

(6) stowage of articles in the cabin;

(7) use of dangerous goods, if applicable;

(8) incident and accident review; and

(9) crew resource management: all major topics of the initial CRM training should be covered over a period not exceeding 3 years.

(c) Recurrent training should include every 3 years:

(1) practical training on operating and opening all normal and emergency exits for passenger evacuation in an aircraft or representative training device and demonstration of the operation of all other exits;

(2) practical training in the use of all firefighting equipment as well as protective clothing representative of that carried in the aircraft. Each technical crew member should:

(i) extinguish a fire characteristic of an aircraft interior fire except that, in the case of Halon extinguishers, an alternative extinguishing agent may be used; and

(ii) practise the donning and use of protective breathing equipment (when fitted) in an enclosed, simulated smoke-filled environment;

(3) use of pyrotechnics (actual or representative devices); and

(4) demonstration of the use of the life raft, where fitted.

AMC1 ORO.TC.140 Refresher training

ELEMENTS

(a) Refresher training may include familiarisation flights.

(b) Refresher training should include at least the following:

(1) emergency procedures, including pilot incapacitation;

(2) evacuation procedures;

(3) practical training on operating and opening all normal and emergency exits for passenger evacuation in an aircraft or representative training device and demonstration of the operation of all other exits; and

(4) the location and handling of emergency equipment, and the donning of life jackets and protective breathing equipment, when applicable.

Subpart FTL - Flight and Duty Time Limitations and Rest Requirements

Section 1 - General

GM1 ORO.FTL.105(1) Definitions

ACCLIMATISED

(a) A crew member remains acclimatised to the local time of his or her reference time during 47 hours 59 minutes after reporting no matter how many time zones he/she has crossed.

(b) The maximum daily FDP for acclimatised crew members is determined by using table 1 of ORO.FTL.205(b)(1) with the reference time of the point of departure. As soon as 48 hours have elapsed, the state of acclimatisation is derived from the time elapsed since reporting at reference time and the number of time zones crossed.

(c) A crew member is considered to be in an unknown state of acclimatisation after the first 48 hours of the rotation have elapsed unless he or she remains in the first arrival destination time zone (either for rest or any duties) in accordance with the table in ORO.FTL.105(1).

(d) Should a crew member's rotation include additional duties that end in a different time zone than his or her first arrival destination's time zone while he or she is considered to be in an unknown state of acclimatisation, then the crew member remains in an unknown state of acclimatization until he or she:

(1) has taken the rest period required by CS FTL.235(b)(3) at home base;

(2) has taken the rest period required by CS FTL.235(b)(3) at the new location; or

(3) has been undertaking duties starting at and returning to the time zone of the new location until he or she becomes acclimatised in accordance with the values in the table in ORO.FTL.105(1).

To determine the state of acclimatisation, the two following criteria should be applied:

(i) the greater of the time differences between the time zone where he or she was last acclimatised or the local time of his or her last departure point and the new location; and
(ii) the time elapsed since reporting at home base for the first time during the rotation.

GM2 ORO.FTL.105(1) Definitions

ACCLIMATISED 'POINT OF DEPARTURE'

The point of departure refers to the reporting point for a flight duty period or positioning duty after a rest period.

GM3 ORO.FTL.105(1) Definitions

ACCLIMATISED 'TIME ELAPSED SINCE REPORTING AT REFERENCE TIME'

The time elapsed since reporting at reference time for operations applying CS FTL.1.235(b)(3)(ii) at home base refers to the time elapsed since reporting for the first time at home base for a rotation.

GM1 ORO.FTL.105(2) Definitions

REFERENCE TIME

(a) Reference time refers to reporting points in a 2-hour wide time zone band around the local time where a crew member is acclimatised.

(b) Example: A crew member is acclimatised to the local time in Helsinki and reports for duty in London. The reference time is the local time in London.

GM1 ORO.FTL.105(3) Definitions

Adequate Furniture For 'Accommodation'

Adequate furniture for crew member accommodation should include a seat that reclines at least 45° back angle to the vertical, has a seat width of at least 20 inches (50cm) and provides leg and foot support.

GM1 ORO.FTL.105(8) Definitions

DETERMINATION OF DISRUPTIVE SCHEDULES

If a crew member is acclimatised to the local time at his/her home base, the local time at the home base should be used to consider an FDP as 'disruptive schedule'. This applies to operations within the 2-hour wide time zone surrounding the local time at the home base, if a crew member is acclimatized to the local time at his/her home base.

GM1 ORO.FTL.105(10) Definitions

ELEMENTS OF STANDBY FOR DUTY

ORO.FTL.225(c) and (d) and CS FTL.1.225(b)(2) determine which elements of standby count as duty.

GM1 ORO.FTL.105(17) Definitions

OPERATING CREW MEMBER

A person on board an aircraft is either a crew member or a passenger. If a crew member is not a passenger on board an aircraft he/she should be considered as 'carrying out duties'. The crew member remains an operating crew member during in-flight rest. In-flight rest counts in full as FDP, and for the purpose of ORO.FTL.210.

AMC1 ORO.FTL.110 Operator responsibilities

SCHEDULING

(a) Scheduling has an important impact on a crew member's ability to sleep and to maintain a proper level of alertness. When developing a workable roster, the operator should strike a fair balance between the commercial needs and the capacity of individual crew members to work effectively. Rosters should be developed in such a way that they distribute the amount of work evenly among those that are involved.

(b) Schedules should allow for flights to be completed within the maximum permitted flight duty period and flight rosters should take into account the time needed for pre-flight duties, taxiing, the flight- and turnaround times. Other factors to be considered when planning duty periods should include:

(1) the allocation of work patterns which avoid undesirable practices such as alternating day/night duties, alternating eastward-westward or westward-eastward time zone transitions, positioning of crew members so that a serious disruption of established sleep/work patterns occurs;

(2) scheduling sufficient rest periods especially after long flights crossing many time zones; and

(3) preparation of duty rosters sufficiently in advance with planning of recurrent extended recovery rest periods and notification of the crew members well in advance to plan adequate pre-duty rest.

AMC1 ORO.FTL.110(a) Operator responsibilities

PUBLICATION OF ROSTERS

Rosters should be published 14 days in advance.

AMC1 ORO.FTL.110(j) Operator responsibilities

OPERATIONAL ROBUSTNESS OF ROSTERS

The operator should establish and monitor performance indicators for operational robustness of rosters.

GM1 ORO.FTL.110(j) Operator responsibilities

OPERATIONAL ROBUSTNESS OF ROSTERS

Performance indicators for operational robustness of rosters should support the operator in the assessment of the stability of its rostering system. Performance indicators for operational robustness of rosters should at least measure how often a rostered crew pairing for a duty period is achieved within the planned duration of that duty period. Crew pairing means rostered positioning and flights for crew members in one duty period.

GM1 ORO.FTL.120 Fatigue risk management (FRM)

ICAO DOC 9966 — MANUAL FOR THE OVERSIGHT OF FATIGUE MANAGEMENT APPROACHES

Further guidance on FRM processes, appropriate fatigue management, the underlying scientific principles and operational knowledge may be found in ICAO Doc 9966 (Manual for the Oversight of Fatigue Management Approaches).

AMC1 ORO.FTL.120(b)(1) Fatigue risk management (FRM)

CAT OPERATORS FRM POLICY

(a) The operator's FRM policy should identify all the elements of FRM.

(b) The FRM policy should define to which operations FRM applies.

(c) The FRM policy should:

(1) reflect the shared responsibility of management, flight and cabin crew, and other involved personnel;

(2) state the safety objectives of FRM;

(3) be signed by the accountable manager;

(4) be communicated, with visible endorsement, to all the relevant areas and levels of the organisation;

(5) declare management commitment to effective safety reporting;

(6) declare management commitment to the provision of adequate resources for FRM;

(7) declare management commitment to continuous improvement of FRM;

(8) require that clear lines of accountability for management, flight and cabin crew, and all other involved personnel are identified; and

(9) require periodic reviews to ensure it remains relevant and appropriate.

AMC2 ORO.FTL.120(b)(2) Fatigue risk management (FRM)

CAT OPERATORS FRM DOCUMENTATION

The operator should develop and keep current FRM documentation that describes and records:

(1) FRM policy and objectives;

(2) FRM processes and procedures;

(3) accountabilities, responsibilities and authorities for these processes and procedures;

(4) mechanisms for on-going involvement of management, flight and cabin crew members, and all other involved personnel;

(5) FRM training programmes, training requirements and attendance records;

(6) scheduled and actual flight times, duty periods and rest periods with deviations and reasons for deviations; and

(7) FRM outputs including findings from collected data, recommendations, and actions taken.

GM1 ORO.FTL.120(b)(3) Fatigue risk management (FRM)

SCIENTIFIC METHOD

'Scientific method' is defined as 'a method or procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses'.

A scientific study may be required as an element of proactive fatigue hazard identification. Such a study should be based on scientific principles, i.e. use the scientific method. That means that the study should consist of the following elements as applicable to each individual case:

(a) an introduction with a summary and the description of the study design, methods and results;

(b) a statement of the hypothesis being tested, how it is being tested and a conclusion as to whether the hypothesis was found to be true or not;

(c) a description of the data collection method and tools, e.g. the sensitivity of the activity monitors, further information on any model and its limitations and how it is being used as part of the study;

(d) a description of how the study subjects were selected and how representative of the crew member population the study group is;

(e) a description of the rosters the study participants have worked containing data such as e.g. flight and duty hours, number of sectors, duty start/finish times;

(f) reports on mean sleep duration and efficiency and data for other standard measures (e.g. sleep timing, self-rated sleepiness/fatigue, sources of sleep disruption, performance, safety);

(g) a description of how sleep and the other measures varied across the roster (i.e. day-to-day) and where and why minimum sleep occurred;

(h) statistical data analysis to test the hypothesis; and

(i) the explanation of how the study results have been used to influence the design of the roster or other fatigue mitigations.

AMC1 ORO.FTL.120(b)(4) Fatigue risk management (FRM)

CAT OPERATORS IDENTIFICATION OF HAZARDS

The operator should develop and maintain three documented processes for fatigue hazard identification:

(a) Predictive

The predictive process should identify fatigue hazards by examining crew scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance.

Methods of examination may include, but are not limited to:

(1) operator or industry operational experience and data collected on similar types of operations;

(2) evidence-based scheduling practices; and

(3) bio-mathematical models.

(b) Proactive

The proactive process should identify fatigue hazards within current flight operations. Methods of examination may include, but are not limited to:

(1) self-reporting of fatigue risks;

(2) crew fatigue surveys;

(3) relevant flight and cabin crew performance data;

(4) available safety databases and scientific studies; and

(5) analysis of planned versus actual time worked.

(c) Reactive

The reactive process should identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimised. At a minimum, the process may be triggered by any of the following:

(1) fatigue reports;

(2) confidential reports;

(3) audit reports;

(4) incidents; or

(5) flight data monitoring (FDM) events.

AMC2 ORO.FTL.120(b)(4) Fatigue risk management (FRM)

CAT OPERATORS RISK ASSESSMENT

An operator should develop and implement risk assessment procedures that determine the probability and potential severity of fatigue-related events and identify when the associated risks require mitigation. The risk assessment procedures should review identified hazards and link them to:

(a) operational processes;

(b) their probability;

(c) possible consequences; and

(d) the effectiveness of existing safety barriers and controls.

AMC1 ORO.FTL.120(b)(5) Fatigue risk management (FRM)

CAT OPERATORS RISK MITIGATION

An operator should develop and implement risk mitigation procedures that:

(a) select the appropriate mitigation strategies;

(b) implement the mitigation strategies; and

(c) monitor the strategies' implementation and effectiveness.

AMC1 ORO.FTL.120(b)(6) Fatigue risk management (FRM)

CAT OPERATORS FRM SAFETY ASSURANCE PROCESSES

The operator should develop and maintain FRM safety assurance processes to:

(a) provide for continuous FRM performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:

(1) hazard reporting and investigations;

(2) audits and surveys; and

(3) reviews and fatigue studies;

(b) provide a formal process for the management of change which should include, but is not limited to:

(1) identification of changes in the operational environment that may affect FRM;

(2) identification of changes within the organisation that may affect FRM; and

(3) consideration of available tools which could be used to maintain or improve FRM performance prior to implementing changes; and

(c) provide for the continuous improvement of FRM. This should include, but is not limited to:

(1) the elimination and/or modification of risk controls have had unintended consequences or that are no longer needed due to changes in the operational or organizational environment;

(2) routine evaluations of facilities, equipment, documentation and procedures; and

(3) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

AMC1 ORO.FTL.120(b)(7) Fatigue risk management (FRM)

CAT OPERATORS FRM PROMOTION PROCESS

FRM promotion processes should support the on-going development of FRM, the continuous improvement of its overall performance, and attainment of optimum safety levels.

The following should be established and implemented by the operator as part of its FRM:

(a) training programmes to ensure competency commensurate with the roles and responsibilities of management, flight and cabin crew , and all other involved personnel under the planned FRM; and

(b) an effective FRM communication plan that:

(1) explains FRM policies, procedures and responsibilities to all relevant stakeholders; and

(2) describes communication channels used to gather and disseminate FRM-related information.

SECTION 2 - Commercial Air Transport Operators

GM1 ORO.FTL.205(a)(1) Flight Duty Period (FDP)

REPORTING TIMES

The operator should specify reporting times taking into account the type of operation, the size and type of aircraft and the reporting airport conditions.

GM1 ORO.FTL.205(b)(1) Flight duty period (FDP)

REFERENCE TIME

The start time of the FDP in the table refers to the 'reference time'. That means, to the local time of the point of departure, if this point of departure is within a 2-hour wide time zone band around the local time where a crew member is acclimatised.

AMC1 ORO.FTL.205(f) Flight Duty Period (FDP)

UNFORESEEN CIRCUMSTANCES IN ACTUAL FLIGHT OPERATIONS — COMMANDER'S DISCRETION

(a) As general guidance when developing a commander's discretion policy, the operator should take into consideration the shared responsibility of management, flight and cabin crew in the case of unforeseen circumstances. The exercise of commander's discretion should be considered exceptional and should be avoided at home base and/or company hubs where standby or reserve crew members should be available. Operators should asses on a regular basis the series of pairings where commander's discretion has been exercised in order to be aware of possible inconsistencies in their rostering.

(b) The operator's policy on commander's discretion should state the safety objectives, especially in the case of an extended FDP or reduced rest and should take due consideration of additional factors that might decrease a crew member's alertness levels, such as:

- (1) WOCL encroachment;
- (2) weather conditions;
- (3) complexity of the operation and/or airport environment;
- (4) aeroplane malfunctions or specifications;
- (5) flight with training or supervisory duties;
- (6) increased number of sectors;
- (7) circadian disruption; and
- (8) individual conditions of affected crew members (time since awake, sleep-related factor, workload, etc.).

GM1 ORO.FTL.205(f)(1)(i) Flight Duty Period (FDP)

COMMANDER'S DISCRETION

The maximum basic daily FDP that results after applying ORO.FTL.205(b) should be used to calculate the limits of commander's discretion, if commander's discretion is applied to an FDP which has been extended under the provisions of ORO.FTL.205(d).

AMC1 ORO.FTL.210(c) Flight times and duty periods

POST-FLIGHT DUTIES

The operator should specify post-flight duty times taking into account the type of operation, the size and type of aircraft and the airport conditions.

GM1 ORO.FTL.230(a) Reserve

ROSTERING OF RESERVE

Including reserve in a roster, also referred to as 'rostering', implies that a reserve period that does not result in a duty period may not retrospectively be considered as part of a recurrent extended recovery rest period.

AMC1 ORO.FTL.240 Nutrition

MEAL OPPORTUNITY

(a) The operations manual should specify the minimum duration of the meal opportunity, when a meal opportunity is provided, in particular when the FDP encompasses the regular meal windows (e.g. if the FDP starts at 11:00 hours and ends at 22:00 hours meal opportunities for two meals should be given).

(b) It should define the time frames in which a regular meal should be consumed in order not to alter the human needs for nutrition without affecting the crew member's body rhythms.

AMC1 ORO.FTL.250 Fatigue management training

TRAINING SYLLABUS FATIGUE MANAGEMENT TRAINING

The training syllabus should contain the following:

(a) applicable regulatory requirements for flight, duty and rest;

(b) the basics of fatigue including sleep fundamentals and the effects of disturbing the circadian rhythms;

(c) the causes of fatigue, including medical conditions that may lead to fatigue;

(d) the effect of fatigue on performance;

(e) fatigue countermeasures;

(f) the influence of lifestyle, including nutrition, exercise, and family life, on fatigue;

(g) familiarity with sleep disorders and their possible treatments;

(h) where applicable, the effects of long range operations and heavy short range schedules on individuals;

(i) the effect of operating through and within multiple time zones; and

(j) the crew member responsibility for ensuring adequate rest and fitness for flight duty.

CERTIFICATION SPECIFICATIONS

AND GUIDANCE MATERIAL

FOR COMMERCIAL AIR TRANSPORT BY AEROPLANE

— SCHEDULED AND CHARTER OPERATIONS

CS FTL.1.100 Applicability

These Certification Specifications are applicable to commercial air transport by aeroplanes for scheduled and charter operations, excluding emergency medical service (EMS), air taxi and single pilot operations.

CS FTL.1.200 Home base

(a) The home base is a single airport location assigned with a high degree of permanence.

(b) In the case of a change of home base, the first recurrent extended recovery rest period prior to starting duty at the new home base is increased to 72 hours, including 3 local nights. Travelling time between the former home base and the new home base is positioning.

GM1 CS FTL.1.200 Home base

TRAVELLING TIME

Crew members should consider making arrangements for temporary accommodation closer to their home base if the travelling time from their residence to their home base usually exceeds 90 minutes.

CS FTL.1.205 Flight duty period (FDP)

(a) Night duties under the provisions of ORO.FTL.205(b) and (d) comply with the following:

(1) When establishing the maximum FDP for consecutive night duties, the number of sectors is limited to 4 sectors per duty.

(2) The operator applies appropriate fatigue risk management to actively manage the fatiguing effect of night duties of more than 10 hours in relation to the surrounding duties and rest periods.

(b) Extension of FDP without in-flight rest

The extension of FDP without in-flight rest under the provisions of ORO.FTL.205(d)(5) is limited to the values specified in the table below.

Maximum daily FDP with extension

Starting time of FDP	1–2 sectors (in hours)	3 sectors (in hours)	4 sectors (in hours)	5 sectors (in hours)
0600-0614	Not allowed	Not allowed	Not allowed	Not allowed
0615-0629	13:15	12:45	12:15	11:45
0630-0644	13:30	13:00	12:30	12:00
0645-0659	13:45	13:15	12:45	12:15
0700-1329	14:00	13:30	13:00	12:30
1330-1359	13:45	13:15	12:45	Not allowed
1400-1429	13;30	13:00	12:30	Not allowed
1430-1459	13:15	12:45	12:15	Not allowed
1500-1529	13:00	12:30	12:00	Not allowed
1530-1559	12:45	Not allowed	Not allowed	Not allowed
1600-1629	12:30	Not allowed	Not allowed	Not allowed
1630-1659	12:15	Not allowed	Not allowed	Not allowed
1700-1729	12:00	Not allowed	Not allowed	Not allowed
1730-1759	11:45	Not allowed	Not allowed	Not allowed
1800-1829	11:30	Not allowed	Not allowed	Not allowed
1830-1859	11:15	Not allowed	Not allowed	Not allowed
1900-0359	Not allowed	Not allowed	Not allowed	Not allowed
0400-0414	Not allowed	Not allowed	Not allowed	Not allowed
0415-0429	Not allowed	Not allowed	Not allowed	Not allowed
0430-0444	Not allowed	Not allowed	Not allowed	Not allowed
0445-0459	Not allowed	Not allowed	Not allowed	Not allowed
0500-0514	Not allowed	Not allowed	Not allowed	Not allowed
0515-0529	Not allowed	Not allowed	Not allowed	Not allowed
0530-0544	Not allowed	Not allowed	Not allowed	Not allowed
0545-0559	Not allowed	Not allowed	Not allowed	Not allowed

(c) Extension of FDP due to in-flight rest

In-flight rest facilities in accordance with ORO.FTL.205(e)(iii) fulfil the following minimum standards:

— ‘Class 1 rest facility’ means a bunk or other surface that allows for a flat or near flat sleeping position. It reclines to at least 80° back angle to the vertical and is located separately from both the flight crew compartment and the passenger cabin in an area that allows the crew member to control light, and provides isolation from noise and disturbance;

— ‘Class 2 rest facility’ means a seat in an aircraft cabin that reclines at least 45° back angle to the vertical, has at least a pitch of 55 inches (137,5 cm), a seat width of at least 20 inches (50 cm) and provides leg and foot support. It is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or crew members;

— ‘Class 3 rest facility’ means a seat in an aircraft cabin or flight crew compartment that reclines at least 40° from the vertical, provides leg and foot support and is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is not adjacent to any seat occupied by passengers.

(1) The extension of FDP with in-flight rest under the provisions of ORO.FTL.205(e) complies with the following:

(i) the FDP is limited to 3 sectors; and

(ii) the minimum in-flight rest period is a consecutive 90-minute period for each crew member and 2 consecutive hours for the flight crew members at control during landing.

(2) The maximum daily FDP under the provisions of ORO.FTL.205 (e) may be extended due to in-flight rest for flight crew:

(i) with one additional flight crew member:

(A) up to 14 hours with class 3 rest facilities;

(B) up to 15 hours with class 2 rest facilities; or

(C) up to 16 hours with class 1 rest facilities;

(ii) with two additional flight crew members:

(A) up to 15 hours with class 3 rest facilities;

(B) up to 16 hours with class 2 rest facilities; or

(C) up to 17 hours with class 1 rest facilities.

(5) The minimum in-flight rest for each cabin crew member is:

Maximum extended FDP	Minimum in-flight rest (in hours)		
	Class 1	Class 2	Class 3
up to 14:30 hrs	1:30	1:30	1:30
14:31 – 15:00 hrs	1:45	2:00	2:20
15:01 – 15:30 hrs	2:00	2:20	2:40
15:31 – 16:00 hrs	2:15	2:40	3:00
16:01 – 16:30 hrs	2:35	3:00	Not allowed
16:31 – 17:00 hrs	3:00	3:25	Not allowed
17:01 – 17:30 hrs	3:25	Not allowed	Not allowed
17:31 – 18:00 hrs	3:50	Not allowed	Not allowed

(6) The limits specified in (2) may be increased by 1 hour for FDPs that include 1 sector of more than 9 hours of continuous flight time and a maximum of 2 sectors.

(7) All time spent in the rest facility is counted as FDP.

(8) The minimum rest at destination is at least as long as the preceding duty period, or 14 hours, whichever is greater.

(9) A crew member does not start a positioning sector to become part of this operating crew on the same flight.

(d) Unforeseen circumstances in flight operations — delayed reporting

(1) The operator may delay the reporting time in the event of unforeseen circumstances, if procedures for delayed reporting are established in the operations manual. The operator keeps records of delayed reporting. Delayed reporting procedures establish a notification time allowing a crew member to remain in his/her suitable accommodation when the delayed reporting procedure is activated. In such a case, if the crew member is informed of the delayed reporting time, the FDP is calculated as follows:

(i) one notification of a delay leads to the calculation of the maximum FDP according to (iii) or (iv);

(ii) if the reporting time is further amended, the FDP starts counting 1 hour after the second notification or at the original delayed reporting time if this is earlier;

(iii) when the delay is less than 4 hours, the maximum FDP is calculated based on the original reporting time and the FDP starts counting at the delayed reporting time;

(iv) when the delay is 4 hours or more, the maximum FDP is calculated based on the more limiting of the original or the delayed reporting time and the FDP starts counting at the delayed reporting time;

(v) as an exception to (i) and (ii), when the operator informs the crew member of a delay of 10 hours or more in reporting time and the crew member is not further disturbed by the operator, such delay of 10 hours or more counts as a rest period.

GM1 CS FTL.1.205(a)(2) Flight duty period (FDP)

NIGHT DUTIES – APPROPRIATE FATIGUE RISK MANAGEMENT

(a) When rostering night duties of more than 10 hours (referred to below as 'long night duties'), it is critical for the crew member to obtain sufficient sleep before such duties when he/she is adapted to being awake during day time hours at the local time where he/she is acclimatised. To optimise alertness on long night duties, the likelihood of obtaining sleep as close as possible to the start of the FDP should be considered, when rostering rest periods before long night duties, by providing sufficient time to the crew member to adapt to being awake during the night. Rostering practices leading to extended wakefulness before reporting for such duties should be avoided. Fatigue risk management principles that could be applied to the rostering of long night duties may include:

(1) avoiding long night duties after extended recovery rest periods

(2) progressively delaying the rostered ending time of the FDPs preceding long night duties;

(3) starting a block of night duties with a shorter FDP; and

(4) avoiding the sequence of early starts and long night duties.

(b) Fatigue risk management principles may be applied to the rostering of long night duties by means of:

(1) considering operator or industry operational experience and data collected on similar operations;

(2) evidence-based scheduling practices; and

(3) bio-mathematical models.

GM1 CS FTL.1.205(c)(1)(ii) Flight Duty Period (FDP)

IN-FLIGHT REST

In-flight rest should be taken during the cruise phase of the flight.

GM2 CS FTL.1.205(c)(1)(ii) Flight Duty Period (FDP)

IN-FLIGHT REST

In-flight rest periods should be allocated in order to optimise the alertness of those flight crew members at control during landing.

GM1 CS FTL.1.205(d) Flight Duty Period (FDP)

DELAYED REPORTING

Operator procedures for delayed reporting should:

(a) specify a contacting mode;

(b) establish minimum and maximum notification times; and

(c) avoid interference with sleeping patterns when possible.

CS FTL.1.220 Split duty

The increase of limits on flight duty, under the provisions of ORO.FTL.220, complies with the following:

(a) The break on the ground within the FDP has a minimum duration of 3 consecutive hours.

(b) The break excludes the time allowed for post and pre-flight duties and travelling. The minimum total time for post and pre-flight duties and travelling is 30 minutes. The operator specifies the actual times in its operations manual.

(c) The maximum FDP specified in ORO.FTL.205(b) may be increased by up to 50 % of the break.

(d) Suitable accommodation is provided either for a break of 6 hours or more or for a break that encroaches the window of circadian low (WOCL).

(e) In all other cases:

(1) accommodation is provided; and

(2) any time of the actual break exceeding 6 hours or any time of the break that encroaches the WOCL does not count for the extension of the FDP.

(f) Split duty cannot be combined with in-flight rest.

GM1 CS FTL.1.220(b) Split duty

POST, PRE-FLIGHT DUTY AND TRAVELLING TIMES

The operator should specify post and pre-flight duty and travelling times taking into account aircraft type, type of operation and airport conditions.

CS FTL.1.225 Standby

The modification of limits on flight duty, duty and rest periods under the provisions of ORO.FTL.225 complies with the following:

(a) Airport standby

(1) If not leading to the assignment of an FDP, airport standby is followed by a rest period as specified in ORO.FTL.235.

(2) If an assigned FDP starts during airport standby, the following applies:

(i) the FDP counts from the start of the FDP. The maximum FDP is reduced by any time spent on standby in excess of 4 hours;

(ii) the maximum combined duration of airport standby and assigned FDP as specified in ORO.FTL.205(b) and (d) is 16 hours.

(b) Standby other than airport standby:

(1) the maximum duration of standby other than airport standby is 16 hours;

(2) The operator's standby procedures are designed to ensure that the combination of standby and FDP do not lead to more than 18 hours awake time;

(3) 25 % of time spent on standby other than airport standby counts as duty time for the purpose of ORO.FTL.210;

(4) standby is followed by a rest period in accordance with ORO.FTL.235;

(5) standby ceases when the crew member reports at the designated reporting point;

(6) if standby ceases within the first 6 hours, the maximum FDP counts from reporting;

(7) if standby ceases after the first 6 hours, the maximum FDP is reduced by the amount of standby time exceeding 6 hours;

(8) if the FDP is extended due to in-flight rest according to CS FTL.1.205(c), or to split duty according to CS FTL.1.220, the 6 hours of paragraph (6) and (7) are extended to 8 hours;

(9) if standby starts between 23:00 and 07:00, the time between 23:00 and 07:00 does not count towards the reduction of the FDP under (6), (7) and (8) until the crew member is contacted by the operator; and

(10) the response time between call and reporting time established by the operator allows the crew member to arrive from his/her place of rest to the designated reporting point within a reasonable time.

GM1 CS FTL.1.225 Standby

MINIMUM REST AND STANDBY

(a) If airport or other standby initially assigned is reduced by the operator during standby that does not lead to an assignment to a flight duty period, the minimum rest requirements specified in ORO.FTL.235 should apply.

(b) If a minimum rest period as specified in ORO.FTL.235 is provided before reporting for the duty assigned during the standby, this time period should not count as standby duty.

(c) Standby other than airport standby counts (partly) as duty for the purpose of ORO.FTL.210 only. If a crew member receives an assignment during standby other than airport standby, the actual reporting time at the designated reporting point should be used for the purpose of ORO.FTL.235.

GM1 CS FTL.1.225(b) Standby

STANDBY OTHER THAN AIRPORT STANDBY NOTIFICATION

Operator procedures for the notification of assigned duties during standby other than airport standby should avoid interference with sleeping patterns if possible.

GM1 CS FTL.1.225(b)(2) Standby

AWAKE TIME

Scientific research shows that continuous awake in excess of 18 hours can reduce the alertness and should be avoided.

CS FTL.1.230 Reserve

The operator assigns duties to a crew member on reserve under the provisions of ORO.FTL.230 complying with the following:

(a) An assigned FDP counts from the reporting time.

(b) Reserve times do not count as duty period for the purpose of ORO.FTL.210 and ORO.FTL.235.

(c) The operator defines the maximum number of consecutive reserve days within the limits of ORO.FTL.235(d).

(d) To protect an 8-hour sleep opportunity, the operator rosters a period of 8 hours, taking into account fatigue management principles, for each reserve day during which a crew member on reserve is not contacted by the operator.

GM1 CS FTL.1.230 Reserve

RESERVE NOTIFICATION

Operator procedures for the notification of assigned duties during reserve should avoid interference with sleeping patterns if possible.

GM2 CS FTL.1.230 Reserve

NOTIFICATION IN ADVANCE

The minimum 'at least 10 hours' between the notification of an assignment for any duty and reporting for that duty during reserve may include the period of 8 hours during which a crew member on reserve is not contacted by the operator.

GM1 CS FTL.1.230(c) Reserve

RECURRENT EXTENDED RECOVERY REST

ORO.FTL.235(d) applies to a crew member on reserve.

CS FTL.1.235 Rest periods

(a) Disruptive schedules

(1) If a transition from a late finish/night duty to an early start is planned at home base, the rest period between the 2 FDPs includes 1 local night.

(2) If a crew member performs 4 or more night duties, early starts or late finishes between 2 extended recovery rest periods as defined in ORO.FTL.235(d), the second extended recovery rest period is extended to 60 hours.

(b) Time zone differences

(1) For the purpose of ORO.FTL.235(e)(1), 'rotation' is a series of duties, including at least one flight duty, and rest period out of home base, starting at home base and ending when returning to home base for a rest period where the operator is no longer responsible for the accommodation of the crew member.

(2) The operator monitors rotations and combinations of rotations in terms of their effect on crew member fatigue, and adapts the rosters as necessary.

(3) Time zone differences are compensated by additional rest, as follows:

(i) At home base, if a rotation involves a 4 hour time difference or more, the minimum rest is as specified in the following table.

Minimum local nights of rest at home base to compensate for time zone differences

Maximum time difference (h) between reference time and local time where a crew member rests during a rotation	Time elapsed (h) since reporting for the first FDP in a rotation involving at least 4 hour time difference to the reference time			
	< 48	48 – 71:59	72 – 95:59	≥96
≤ 6	2	2	3	3
≤ 9	2	3	3	4
≤ 12	2	3	4	5

(ii) Away from home base, if an FDP involves a 4-hour time difference or more, the minimum rest following that FDP is at least as long as the preceding duty period, or 14 hours, whichever is greater. By way of derogation from point (b)(3)(i) and only once between 2 recurrent extended recovery rest periods as specified in ORO.FTL.235(d), the minimum rest provided under this point (b)(3)(ii) may also apply to home base if the operator provides suitable accommodation to the crew member.

(10) In case of an Eastward-Westward or Westward-Eastward transition, at least 3 local nights of rest at home base are provided between alternating rotations.

(11) The monitoring of combinations of rotations is conducted under the operator's management system provisions.

(c) Reduced rest

(1) The minimum reduced rest periods under reduced rest arrangements are 12 hours at home base and 10 hours out of base.

(2) Reduced rest is used under fatigue risk management.

(3) The rest period following the reduced rest is extended by the difference between the minimum rest period specified in ORO.FTL.235(a) or (b) and the reduced rest.

(4) The FDP following the reduced rest is reduced by the difference between the minimum rest period specified in ORO.FTL.235(a) or (b) as applicable and the reduced rest.

(5) There is a maximum of 2 reduced rest periods between 2 recurrent extended recovery rest periods specified in accordance with ORO.FTL.235(d).

GM1 CS FTL.1.235(b)(3) Rest periods

TIME ELAPSED SINCE REPORTING

The time elapsed since reporting for a rotation involving at least a 4-hour time difference to the reference time stops counting when the crew member returns to his/her home base for a rest period during which the operator is no longer responsible for the accommodation of the crew member.

GM2 CS FTL.1.235(b)(3) Additional rest to compensate for time zone differences

REST AFTER ROTATIONS WITH THREE OR MORE FLIGHT DUTY PERIODS

For a rotation with three or more FDPs, the greatest time zone difference from the original reference time should be used to determine the minimum number of local nights of rest to compensate for time zone differences. If such a rotation includes time zones crossings in both directions, the calculation is based on the highest number of time zones crossed in any one FDP during the rotation.

Appendix 1 – Declaration

DECLARATION

in accordance with Organisation Requirements for Air Operations

Operator

Name:

Place in which the operator is established or residing and place from which the operations are directed:

Name and contact details of the accountable manager:

Aircraft operation

Starting date of operation/applicability date of the change:

Information on aircraft, operation and continuing airworthiness management organisation

Aircraft MSN	Aircraft type	Aircraft registration	Main base	Type(s) of operation	Organisation responsible for the continuing airworthiness management

Where applicable, details of approvals held (attach list of specific approvals, including specific approvals granted by a third-country, to the declaration, if applicable)

Where applicable, details of specialised operations authorisation held (attach authorisations, if applicable)

Where applicable, list of alternative means of compliance with references to the associated AMCs they replace (attach AltMoC)

Statements

☐ The operator complies, and will continue to comply, with the essential requirements set out in Part SPA and the requirements set in BAR 6

☐ The management system documentation including the operations manual reflect the applicable requirements set out in Part-ORO, Part-NCC and Part-SPA.

All flights will be carried out in accordance with the procedures and instructions specified in the operations manual

☐ All aircraft operated hold a valid certificate of airworthiness in accordance with Continuing Airworthiness Requirements or meet the specific airworthiness requirements applicable to aircraft registered in a third country and subject to a lease agreement.

☐ All flight crew members hold a licence in accordance with Part DEF as required by point ORO.FC.100(c) of Part ORO and cabin crew members, where applicable, are trained in accordance with Subpart CC of Part ORO.

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☐ (If applicable)

The operator has implemented and demonstrated conformity to a recognised industry standard.

Reference of the standard:

Certification body:

Date of the last conformity audit:

☐ The operator will notify to the Brunei DCA any changes in circumstances affecting its compliance with the essential requirements set out in Part SPA and with the requirements of BAR 6 as declared to the Brunei DCA through this declaration and any changes to the information and lists of AltMoC included in and annexed to this declaration, as required by point ORO.GEN.120(a) of Part ORO.
☐ The operator confirms that the information disclosed in this declaration is correct.
Date, name and signature of the accountable manager