STATE OF LIBYA
GOVERNMENT OF LIBYA
MINISTRY OF TRANSPORT
CIVIL AVIATION AUTHORITY

دولة ليبيا
الحكومة الليبية
وزارة المواصلات
مصلحة الطيران المدني

LIBYA CIVIL AVIATION REGULATIONS
AIR OPERATIONS
AMC (ACCEPTABLE MEANS OF COMPLIANCE) & GM (GUIDANCE MATERIAL)

PART ORO
ORGANISATION REQUIREMENTS FOR AIR OPERATIONS

Amendment 1- August 2016

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INTRODUCTION

1. The LYCAA has adopted associated compliance or interpretative material to Part ORO. This document is based on EASA Acceptable Means of Compliance (AMCs) and Guidance Materials (GMs).
2. This is Amendment 1 to AMC & GM to LYCARs – Air Operations Part ORO.
3. Unless specifically stated otherwise, clarification will be based on this material or other EASA documentation, therefore, reference to EASA in this document may still be used for clarification and guidance.
4. The information contained herein is subject to constant review in the light of changing regulations and requirements. No subscriber or other reader should act on the basis of any such information without also referring to the applicable laws and regulations and/or without taking appropriate professional advice when/as indicated/required. Although, every effort has been made to ensure accuracy, the Libyan Civil Aviation Authority, shall not be held responsible for loss or damage caused by errors, omissions, misprints or misinterpretation of the contents hereof.
5. Copies of this publication can be obtained from the following address:

   Flight Safety Department

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Signed on 30 August 2016, by

30.8.16

Captain Nasereddin Shaebelain

Director General

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SECTION I — GENERAL

GM1 ORO.GEN.105 LyCAA

NON-COMMERCIAL OPERATIONS

For the determination of the principal place of business 'activities referred to in this Part' means those activities to which Part-ORO, Part-NCC or Part-SPO apply. For organisations that also exercise activities that are not subject to Part-ORO, Part-NCC or Part-SPO, the determination of the principal place of business should consider that part of the organisation that is responsible for the operation of aircraft subject to Part-ORO, Part-NCC or Part-SPO. For non-commercial operations, this is usually the home base of the aircraft concerned, or the location of the flight department.

(a) For organisations that also exercise activities not subject to Part-ORO, Part-NCC or Part-SPO, the reference to the accountable manager is intended to mean the manager who has the authority to ensure that all activities subject to Part-ORO, Part-NCC or Part-SPO can be financed and carried out in accordance with the applicable requirements.

(b) If the accountable manager is not located in that part of the organisation that is responsible for the operation of aircraft, but the majority of other management personnel are located there, the location of the accountable manager may not need to be considered for the determination of the principal place of business.

AMC1 ORO.GEN.110(a) Operator responsibilities

SECURITY TRAINING PROGRAMME FOR CREW MEMBERS — CAT OPERATIONS

Without prejudice to Regulation (EC) No 300/2008, the 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 Member State;

(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, in accordance with Regulation (EC) No 300/2008, 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

In accordance with Regulation (EC) No 300/2008, 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.

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(a) Operator responsibilities

SECURITY TRAINING PROGRAMME FOR CREW MEMBERS

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

GM1 ORO.GEN.110(c) Operator responsibilities

OPERATIONAL CONTROL

(a) ORO.GEN.110(c) does not imply a requirement for licensed flight dispatchers or a full flight watch system.

(b) If the operator employs flight operations officers in conjunction with a method of operational control, training for these personnel should be based on relevant parts of ICAO Doc 7192 Training Manual, Part D-3. This training should be described in the operations manual.

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 in accordance with LCARs; 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 firefighting services, medical and ambulance services, air traffic services, security services, police, aerodrome operations, air operators.

GM1 ORO.GEN.110(f) Operator responsibilities

STERILE FLIGHT CREW COMPARTMENT

(a) (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.

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.

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, oven 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.

(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			

Duties	Pre-take off	In-flight	Pre-landing	Post-landing
(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)	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) Cabin crew at assigned crew stations	X	if required	X	X
(12) Surveillance of passenger cabin	X	X	X	X
(13) 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
(14) Actions to be taken when turbulence is encountered		X		
(15) Actions to be taken in case of in-flight incidents (e.g. medical emergency)		X		
(16) Actions to be taken in the event of emergency situations	X	X	X	
(17) Disarming of door/exit slides		X		X
(18) 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 requirements of LCARs 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) 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 air operator certificate 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, the operator should inform the LyCAA at least 10 days before the date of the proposed change.

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

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

GENERAL

(a) Typical examples of changes that may affect the air operator certificate 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;

(7) Any of the persons referred to in ORO.GEN.210 (a) and (b);

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

(9) The facilities.

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

(b) Changes requiring prior approval may only be implemented upon receipt of formal approval by the LyCAA.

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 LyCAA under the previous name, as a means of demonstrating how the operator complies with the applicable requirements.

GM3 ORO.GEN.130(b) Changes related to an AOC holder

CHANGES REQUIRING PRIOR APPROVAL

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

(a) Alternative means of compliance;

(b) Procedures regarding items to be notified to the LyCAA;

(c) Cabin crew:

(1) Evacuation procedures with a reduced number of required cabin crew during ground operations or in unforeseen circumstances;

(2) Conduct of the training, examination and checking required by Part-CC of LCARs Aircrew Regulations and issue of cabin crew attestations;

(3) Procedures for cabin crew to operate on four aircraft types;

(4) Training programmes, including syllabi;

(d) Leasing agreements;

(e) Non-commercial operations by air operator certificate (AOC) holders;

(f) Specific approvals in accordance with Annex V (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 policy;

(j) Helicopter operations:

(1) Airborne radar approaches;

(2) Over a hostile environment located outside a congested area, unless the operator holds an approval to operate according to Subpart J of Annex V (SPA.HEMS);

(3) Procedures for selecting off-shore alternates;

(4) To/from a public interest site;

(5) Without an assured safe forced landing capability;

(k) Mass and balance:

(1) Standard masses for load items other than standard masses for passengers and checked baggage;

(2) Use of on-board mass and balance computer systems;

(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);

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

(p) 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;

(q) 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;

(r) Aircraft categories:

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

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 in Appendix 1 to AMC1 ORO.GEN.160 and as required by the applicable rules on occurrence reporting in civil aviation.

(b) In addition, 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.

SECTION II — 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 management system. 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.

(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

(e) 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.

(f) 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.

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) Resolve identified 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.

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 LyCAA.

(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 OCCURRENCE REPORTING SCHEME

(a) The overall purpose of the scheme is to use reported information to improve the level of 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 is 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 different way.

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 LyCAA.

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:

(13) Enhancement of vigilance during inspections and regular maintenance and appropriate adjustments to maintenance practices;

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

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

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

(17) Completion of any additional maintenance recommended by the TCH or by the LyCAA.

(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 together with, as applicable, a report 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		

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 Annex;

(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, training 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 Annex and other applicable Annexes.

(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:
   (1) Privileges of the operator;
   (2) Manuals, logs, and records;
   (3) Training standards;
   (4) Management system procedures and manuals.

(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.

(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;

(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 No.
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 LyCAA			
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			
Training records updated and accurate			
All pilot licenses checked for currency, correct ratings and valid medical check			
All pilots received recurrent training			
Training facilities & Instructors approved			
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:	
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 Law N°6 of 2005 and LCARs.

(b) Operators with up to 20 FTEs involved in the activity subject to Basic Regulation and its Implementing Rules 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, whether any of the following are present:

(i) Operations requiring the following specific approvals: performance-based navigation (PBN), low visibility operation (LVO), extended range operations with two-engined aeroplanes (ETOPS), helicopter hoist operation (HHO), helicopter emergency medical service (HEMS), night vision imaging system (NVIS) and dangerous goods (DG);

(ii) Commercial specialised operations requiring an authorisation;

(iii) Different types of aircraft used;

(iv) The 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.

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.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.

SUBPART AOC — Air operator certification

AMC1 ORO.AOC.100 Application for an air operator certificate (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 air operator certificate

OPERATOR SECURITY PROGRAMME

In accordance with Regulation (EC) No 300/2008, as part of granting the AOC, the CAT operator should provide the competent authority 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.

AMC1 ORO.AOC.110 Leasing agreement

GENERAL

The operator intending to lease-in an aircraft should provide the LyCAA 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; and

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

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

If the operator is not intending to apply Libyan safety requirements for air operations and continuing airworthiness when wet leasing-in an aircraft registered in a third country, it should demonstrate to the LyCAA 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, including related CS-FTL; and

  (7) ORO.SEC;

(c) Part-SPA, if applicable;

(d) for continuing airworthiness management of the third country operator, 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 LyCAA 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) to 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

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 LyCAA, the operator intending to wet lease-out an aircraft should provide the LyCAA 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 Libyan 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 LyCAA 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 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 addresses the scope of the regulation in sufficient detail;

(3) The third party provider uses an evaluation system, designed to assess the operational, management and control systems of the third country code-share operator;

(4) 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 to the operator;

(9) Procedures have been established for monitoring continued compliance of the third country code-share operator with the applicable requirements, taking into account the timelines in AMC1 ORO.AOC.115(b)(b) and (c);

(10) Procedures have been established to notify the third country code-share operator 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 third country code-share operator does not exempt the EU operator from its responsibility under ORO.AOC.115.

(c) The Libyan 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 LyCAA upon request.

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) An 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. A sample list is provided in Appendix 1 to AMC1 ORO.AOC.130. The event detection 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 an 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 an already installed full quick access recorder (QAR), in a modern aircraft with digital systems, to a basic 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

DEFINITION OF AN FDM PROGRAMME

For the purposes of this Guidance Material, an FDM programme may be defined as a proactive and non-punitive programme for gathering and analysing data recorded during routine flights to improve aviation safety.

(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 to operators.

Examples: high lift-off rotation rate, stall warning, ground proximity warning system (GPWS) warning, flap limit speed exceedance, fast approach, high/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.

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

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

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

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

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 an FDM programme, for example:

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

Examples: rate of unstable approaches or hard landings.

(ii) 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.

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

(iii) 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.

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

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

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

(v) 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.

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 LyCAA. 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 an FDM programme

(1) General considerations

(i) Typically, the following steps are necessary to implement an 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 an 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.

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.

(ii) 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.

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.

(iii) 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.

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 an 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.

Appendix 1 to AMC1 ORO.AOC.130 Flight data monitoring — aeroplanes

TABLE 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.

Event Group	Description
Rejected take-off	High speed rejected take-off
Take-off pitch	Pitch rate 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
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
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 (VMO) exceedance
	Maximum operating speed limit (MMO) exceedance
	Flap placard speed exceedance
	Gear down speed exceedance
	Gear selection up/down speed exceedance
	Flap/slat altitude exceedance
	Maximum operating altitude exceedance

GM2 ORO.AOC.130 Flight data monitoring — aeroplanes

FLIGHT DATA MONITORING

Additional guidance material for the establishment of flight data monitoring can be found in UK Civil Aviation Authority CAP 739 (Flight Data Monitoring).

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 PERSONS 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 licensing provisions that are listed in (b) to (f).

Exceptionally, in particular cases, the LyCAA 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 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 Libyan 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 should have the relevant knowledge and appropriate experience requirements related to aircraft continuing airworthiness as detailed in Part-M.

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 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 LyCAA of the existence of an operator; and

(c) Enable the LyCAA 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, and therefore has to declare its capability and means to discharge the responsibilities associated with the operation of the aircraft to the LyCAA.

In such a case, it should also be assessed whether the third party operator undertakes a commercial operation.

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 PERSONS 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 Libyan 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 LYCAA

The operator intending to lease-in an aircraft or operator should provide the LyCAA 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 LIBYA

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

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 Libyan safety requirements for air operations and continuing airworthiness when wet leasing-in an aircraft registered in a third country, it should demonstrate to the LyCAA 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, 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 LyCAA 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 LyCAA.

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 the LyCAA, 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 LyCAA 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 LyCAA 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 — NON-COMMERCIAL OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT AND COMMERCIAL AIR TRANSPORT OPERATIONS WITH SINGLE-ENGINED PROPELLER DRIVEN AEROPLANES WITH A MOPSC OF 5 OR SINGLE ENGINED NON-COMPLEX HELICOPTERS WITH A MOPSC OF 5, TAKING OFF AND LANDING AT THE SAME AERODROME OR OPERATING SITE, UNDER VFR BY DAY AND COMMERCIAL AIR TRANSPORT 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 — COMMERCIAL AIR TRANSPORT 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 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 air operator certificate (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 LyCAA 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:

(c) Alcohol and other intoxicating liquids,

(d) Narcotics,

(e) Drugs,

(f) Sleeping tablets,

(g) Anti-depressants,

(h) Pharmaceutical preparations,

(i) Immunisation,

(j) Deep-sea diving,

(k) Blood/bone marrow donation,

(l) Meal precautions prior to and during flight,

(m) Sleep and rest,

(n) 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.

8.2 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 defueling including when an auxiliary power unit is in operation or when rotors are running or when an engine is or engines are running and the prop-brakes are on;

(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.

8.6 Use of the minimum equipment and configuration deviation list(s).

8.7 Non-revenue flights. Procedures and limitations, for example, for the following:

(a) Non-commercial operations by AOC holders, a description of the differences to commercial operations,

(b) Training flights,

(c) Test flights,

(d) Delivery flights,

(e) Ferry flights,

(f) Demonstration flights,

(g) Positioning flights, including the kind of persons who may be carried on such 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.

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, taking into account Libyan Regulations regarding security. 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

(h) (1) a full quotation of CAT.GEN.MPA.195(a); and

(i) (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.

(j) (h) Procedures required by CAT.GEN.MPA.195 for using the CVR recording or its transcript without prejudice to Regulation (EU) No 996/2010, when applicable

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 following 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 Annex IV (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, is 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 is 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

10.1.1 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.

10.1.2 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

11.1.1 Instructions for preparation for emergency evacuation, including crew coordination and emergency station assignment.

11.1.2 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.).

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 of LCARs Air crew 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 Part SPA (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 ORO 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 commercial air transport operations.

4 Description of documentation to be stored and storage periods. “

(c) N/A.

(d) 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 to 7 refer to AMC3 ORO.MLR.100.

And Add:

“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, taking into account Libyan Regulations in that matter. Some parts of the security instructions and guidance may be kept confidential.

11 HANDLING, NOTIFYING AND REPORTING ACCIDENTS, INCIDENTS AND OCCURRENCES USING THE CVR RECORDING

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 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 lowflying clearances.

13 LEASING

Refer to AMC3 ORO.MLR.100.

“B AIRCRAFT OPERATING MATTERS — TYPE RELATED

For chapters 0 and1 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."

(a) 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.

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 LyCAA.

(b) The MMEL 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 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.

(d) 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.

(e) 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.

(b) An acceptable timescale for submitting the amended MEL to the LyCAA is 90 days from the effective date specified in the approved change to the MMEL.

(c) Reduced timescales for the implementation of safety-related amendments may be required if the LyCAA considers 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 special 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.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) Examples of operations carried out by the operator in accordance 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 LYCAA

(a) The operator's procedures to address the extension of rectification intervals and ongoing surveillance to ensure compliance should provide the LyCAA 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 LyCAA 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 LyCAA 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 Regulation Airworthiness of Aircraft.

(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 LyCAA to approve the MEL. The LyCAA 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 LCARs Continuing Airworthiness.

(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 the:

(1) Modified procedure is applicable to the operator’s MEL; and

(2) 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 LyCAA 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 LYCAA

(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 LyCAA 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 LYCAA

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.

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.

SUBPART FC — Flight crew

SECTION I — COMMON REQUIREMENTS

AMC1 ORO.FC.100(c) Composition of flight crew

OPERATIONAL MULTI-PILOT LIMITATION (OML)

The operator should ensure that pilots with an OML on their medical certificate only operate aircraft in multi-pilot operations when the other pilot is fully qualified on the relevant type of aircraft, is not subject to an OML and has not attained the age of 60 years.

AMC1 ORO.FC.105(b)(2);(c) Designation as pilot-in-command / commander

ROUTE/AREA AND AERODROME KNOWLEDGE FOR COMMERCIAL OPERATIONS

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) Area and route training should include 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) Depending on the complexity of the area or route, as assessed by the operator, the following methods of familiarisation should be used:

(i) For the less complex areas or routes, familiarisation by self-briefing with route documentation, or by means of programmed instruction; and

(ii) In addition, for the more complex areas or routes, in-flight familiarisation as a pilot-in-command/commander or co-pilot under supervision, observer, or familiarisation in a flight simulation training device (FSTD) using a database appropriate to the route concerned.

(b) Aerodrome knowledge

(1) Aerodrome 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 aerodrome 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 requirements:

(A) An approved instrument approach procedure;

(B) At least one runway with no performance limited procedure for take-off and/or landing;

(C) Published circling minima not higher than 1 000 ft above aerodrome level; and

(D) Night operations capability.

(ii) Category B — an aerodrome that does not meet the category A requirements or which requires extra considerations such as:

(A) Non-standard approach aids and/or approach patterns;

(B) Unusual local weather conditions;

(C) Unusual characteristics or performance limitations; or

(D) Any other relevant considerations, including obstructions, physical layout, lighting, etc.

(iii) Category C — an aerodrome that requires additional considerations to a category B aerodrome;

(iv) Offshore installations may be categorised as category B or C aerodromes, taking into account the limitations determined in accordance with AMC2 CAT.OP.MPA.105 Use of aerodromes and operating sites.

(c) Prior to operating to a:

(1) Category B aerodrome, the pilot-in-command/commander should be briefed, or self-briefed by means of programmed instruction, on the category B aerodrome(s) concerned. 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.

(2) Category C aerodrome, the pilot-in-command/commander should be briefed and visit the aerodrome as an observer and/or undertake instruction in a suitable FSTD. The completion of the briefing, visit and/or instruction should be recorded.

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) When the operation is undertaken within the last 3 calendar months of that period, the new 12-month period should be counted from the original expiry date.

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(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.125 Differences training and familiarisation training

GENERAL

(a) Differences training requires additional knowledge and training on the aircraft or an appropriate training device. It should be carried out:
  (1) When introducing a significant change of equipment and/or procedures on types or variants currently operated; and
  (2) 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
  (3) In the case of helicopters, when operating a variant of a helicopter currently operated.

(b) Familiarisation training requires only the acquisition of additional knowledge. It should be carried out when:
  (1) Operating another helicopter or aeroplane of the same type; or
  (2) When introducing a significant change of equipment and/or procedures on types or variants currently operated.

AMC1 ORO.FC.145(b) Provision of training

NON-MANDATORY (RECOMMENDATION) ELEMENTS OF OPERATIONAL SUITABILITY DATA

When developing the training programmes and syllabi, the operator should consider the non-mandatory (recommendation) elements for the relevant type that are provided in the operational suitability data established by the manufacturer

AMC1 ORO.FC.145(d) Provision of training

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.

SECTION II — ADDITIONAL REQUIREMENTS FOR COMMERCIAL AIR TRANSPORT OPERATIONS

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) 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

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

(4) Flight simulation training devices (FSTDs)

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.

(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 change of 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:

- the development and maintenance of the capacity to manage crew resources;
- the acquisition and maintenance of adequate automatic behavioural responses; and
- 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 operato r's m anagem ent 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.

CRM training elements	**Initial operator's CRM training**	**Operator conversion course when changing aircraft type**	**Operator conversion course when changing 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	Required	Required	Required	Required
Relevant to the individual flight crew member					
Personality awareness, human error and reliability, attitudes and behaviours,	In-depth	Not required	Not required	Required	Required

self-assessment and self-critique; Stress and stress management; Fatigue and vigilance; Assertiveness, situation awareness, information acquisition and processing.					
Relevant to the flight crew					
Automation and philosophy on the use of automation	required	In-depth	In-depth	In-depth	In-depth
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:

(A) include debriefing the crew and the individual crew member;

(B) serve to identify additional training, where needed, for the crew or the individual crew member; and

(C) 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;

(iii) resilience development;

(iv) surprise and startle effect; and

(v) effective communication and coordination with other operational personnel and ground services.

(3) Computer-based training

Notwithstanding (a)(3) of AMC1 ORO.FC.115, computer-based training may be conducted as a stand-alone training method.

(4) 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.

AMC3 ORO.FC.115 Crew resource management (CRM) training

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 applicable regulations, who conduct CRM training in the operational environment; and

(ii) trainers or instructors conducting training other than CRM training, but integrating CRM elements into this training.

(b) Qualification of flight crew CRM trainer

(1) A training and standardisation programme for flight crew CRM trainers should be established.

(2) A flight crew CRM trainer, in order to be suitably qualified, should:

(i) have adequate knowledge of the relevant flight operations;

(ii) have adequate knowledge of human performance and limitations (HPL), whilst:

(A) having obtained a commercial pilot licence in accordance with applicable regulations; or

(B) having followed a theoretical HPL course covering the whole syllabus of the HPL examination;

(iii) have completed flight crew initial operator's CRM training;

(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.FC.115.

(3) The following qualifications and experiences are also acceptable for a flight crew CRM trainer in order to be suitably qualified:

(i) A flight crew member holding a recent qualification as a flight crew CRM trainer may continue to be a flight crew CRM trainer after the cessation of active flying duties if he/she maintains adequate knowledge of the relevant flight operations.

(ii) A former flight crew member may become a flight crew CRM trainer if he/she maintains adequate knowledge of the relevant flight operations and fulfils the provisions of (2)(ii) to (2)(vi).

(iii) An experienced CRM trainer may become a flight crew CRM trainer if he/she demonstrates adequate knowledge of the relevant flight operations and fulfils the provisions of (2)(ii) to (2)(vi).

(c) Training of flight crew CRM trainer

(1) 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.

(2) The basic training of flight crew CRM trainers should include the training elements for flight crew, as specified in Table 1 of AMC1 ORO.FC.115. In addition, the basic training should include the following:

(i) introduction to CRM training;

(ii) operator's management system ;

(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; and

(iv) assessment.

(3) The refresher training of flight crew CRM trainers should include new methodologies, procedures and lessons learned.

(4) Instructors, holding a certificate in accordance with Commission Regulation (EU) No 1178/2011, who are also CRM trainers, may combine the CRM trainer refresher training with instructor refresher training.

(5) Instructors for other-than complex motor-powered aircraft should be qualified as flight crew CRM trainers for this aircraft category with no additional training, as specified in (2) and (3) when:

(i) holding a certificate in accordance with the applicable regulations; and

(ii) fulfilling the provisions of (b)(2) or (b)(3).

(i) The training of flight crew CRM trainers should be conducted by flight 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 flight crew CRM trainer

(1) A flight 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) 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.

(e) Recency and renewal of qualification as flight crew CRM trainer

(1) For recency of the 3-year validity period, the flight 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 flight crew CRM trainer does not fulfil the provisions of (1), he/she should, before resuming as flight crew CRM trainer:

(i) comply with the qualification provisions of (b) and (d); and

(ii) complete CRM trainer refresher training.

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;
  (2) training in the operational environment by an instructor holding a certificate in accordance with Commission Regulation (EU) No 1178/2011;
  (3) 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 Commission Regulation (EU) No 1178/2011.

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; 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 t raining 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 Commission Regulation (EU) No 1178/2011, 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
		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 'rem ain o pen 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 system's st
	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?	

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 LyCAA may impose, may be acceptable to the LyCAA 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) 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

(a) 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).

(b) A lesser number of flight hours, on the type and/or in the role, and subject to any other conditions which the LyCAA may impose, may be acceptable to the LyCAA 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).

AMC1 ORO.FC.205 Command course

COMBINED UPGRADING AND CONVERSION COURSE — HELICOPTER

If a pilot is converting from one helicopter type or variant 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 (C RM) 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 AMC3 ORO.FC.115.

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 aircraft systems, and normal, abnormal and emergency procedures;

(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 LCAR - Aircrew.

(5) The operator should ensure that.

(b) 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

(c) the personnel integrating elements of CRM into conversion training are suitably qualified, as specified in AMC3 ORO.FC.115.

(d) 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 on such matters as aircraft systems, performance and flight planning, where applicable.

(e) 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.

(iv) 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.

(v) The operational procedures of security, rescue and emergency services.

(vi) 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.

(vii) 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.

(viii) 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.

(f) 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, 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.

(g) 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.

(h) Passenger handling for operations where no cabin crew is required

Other than general training on dealing with people, emphasis should be placed on the following:

(1) Advice on the recognition and management of passengers who appear or are intoxicated with alcohol, under the influence of drugs or aggressive;

(2) Methods used to motivate passengers and the crowd control necessary to expedite an aircraft evacuation; and

(3) 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.

(i) Discipline and responsibilities, for operations where no cabin crew is required

Emphasis should be placed on discipline and an individual's responsibilities in relation to:

(1) His/her ongoing competence and fitness to operate as a crew member with special regard to flight and duty time limitation (FTL) requirements; and

(2) Security procedures.

(j) Passenger briefing/safety demonstrations, for operations where no cabin crew is required

Training should be given in the preparation of passengers for normal and emergency situations.

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.

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**		
4.	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** (including immediate handling and subsequent operational considerations, as applicable)		
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** (no autopilot, no autothrust/autothrottle and, where possible, without flight directors)		
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) The FFS qualification requirements in (b)(1) are further clarified in the Guidance Material (GM).

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) The FFS qualification requirements in (b)(1) are further specified in the Guidance Material (GM).

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.

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(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(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.

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. Most current and grandfathered FFS models are deficient in representing the aeroplane in the aerodynamic stall regime, thus practising of 'full stall' in such a device could potentially result in negative training or negative transfer of training. The term 'stall event' is therefore introduced to cater for the capability of current and grandfathered FFS, and for potential future FFS enhancements. 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.

IMPORTANT - when using current or grandfathered FFS, the stall event recovery exercises should only be conducted as approach-to-stall exercises.

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)**

6.	**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
7.	**AUTOTHRUST/AUTOTHROTTLE – OFF**	
8.	**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.)	
9.	**BANK – WINGS LEVEL**	
10.	**THRUST – ADJUST** (as needed) (thrust reduction for aeroplanes with underwing mounted engines may be needed)	
11.	**SPEEDBRAKES/SPOILERS - RETRACT**	
12.	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 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

<table>
<tr><th colspan="3">Nose LOW Recovery Strategy Template</th></tr>
<tr><td colspan="3">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.)</td></tr>
<tr><td colspan="2">PF</td><td>PM</td></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>RECOVERY from stall if required</td></tr>
<tr><td>4.</td><td>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)</td></tr>
<tr><td>5.</td><td>THRUST and DRAG – ADJUST (if required)</td></tr>
<tr><td>6.</td><td>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) WARNING: Excessive use of pitch trim or rudder may aggravate the upset situation or may result in high structural loads.</td></tr>
</table>

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 CS-FSTD(A) Appendix 8 to AMC1 FSTD(A).300 General Technical Requirements for FSTD Qualification Levels, and associated FSTD validation tests.

FSTD operators may achieve such demonstration of equivalency through the conduct of a special evaluation by the competent authority. Once the level B FFS is deemed to be qualified, the competent authority 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 competent authority 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 Subpart C Aeroplane Flight Simulation Training Devices AMC1 FSTD(A).300(c)(1)(i) and (2)(ii) 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 Appendix 1 to CS-FSTD(A).300 General r.1).

Table 1: Minimum FSTD standards, validation tests, and functions and subjective tests

FSTD Standards
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
AMC1 FSTD(A).300 Qualification Basis – Table of FSTD Validation Tests (Ref. CS-FSTD(A)
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
AMC1 FSTD(A).300 Qualification Basis – Functions and Subjective Tests (CS-FSTD(A)

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.

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 specify route, route area, or aerodrome used by the operator.

AMC1 ORO.FC.230 Recurrent training and checking

RECURRENT TRAINING SYLLABUS

(a) Recurrent training

Recurrent training should comprise the following:

(1) Ground training

(i) The ground training programme should include:

(A) Aircraft systems;

(B) Operational procedures and requirements, including ground de-icing/anti-icing and pilot incapacitation; and

(C) Accident/incident and occurrence review.

(ii) Knowledge of the ground training should be verified by a questionnaire or other suitable methods.

(iii) When the ground training is conducted within 3 calendar months prior to the expiry of the 12 calendar months period, the next ground and refresher training should be completed within 12 calendar months of the original expiry date of the previous training.

(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 covered in the preceding 3 year period.

(B) When engine-out manoeuvres are carried out in an aircraft, the engine failure should be simulated.

(C) Aircraft/FSTD training may be combined with the operator proficiency check.

(D) When the aircraft/FSTD training is conducted within 3 calendar months prior to the expiry of the 12 calendar months period, the next aircraft/FSTD training should be completed within 12 calendar months of the original expiry date of the previous training.

(ii) Helicopters

(A) Where a suitable FSTD is available, it should be used for the aircraft/FSTD training programme. If the operator is able to demonstrate, on the basis of a compliance and risk assessment, that using 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 for this training to the extent necessary.

(B) The recurrent training should include the following additional items, which should be completed in an FSTD:

- 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

Where applicable, operator proficiency checks should include 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 V1 and V2 (take-off safety speed) or, if carried out in an aeroplane, at a safe speed above V2;

(C) Precision instrument approach to minima with, in the case of multi-engine aeroplanes, one-engine-inoperative;

(D) Non-precision approach 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-engine aeroplanes a practice forced landing is required.

(ii) Helicopters

(A) Where applicable, operator proficiency checks should include the following abnormal/emergency procedures:

- Engine fire;
- Fuselage fire;
- Emergency operation of under carriage;
- Fuel dumping;
- Engine failure and relight;
- Hydraulic failure;
- Electrical failure;
- Engine failure during take-off before decision point;
- Engine failure during take-off after decision point;
- Engine failure during landing before decision point;
- Engine failure during landing after decision point;
- Flight and engine control system malfunctions;
- Recovery from unusual attitudes;
- Landing with one or more engine(s) inoperative;

- Instrument meteorological conditions (IMC) autorotation techniques;
- Autorotation to a designated area;
- Pilot incapacitation;
- Directional control failures and malfunctions.

(B) For pilots required to engage in IFR operations, proficiency checks include the following additional abnormal/emergency procedures:

- 3D approach operation to minima
- Go-around on instruments from minima with, in the case of multi-engined helicopters, a simulated failure of one engine;
- 2D approach operation to minima;
- - 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;;
- Landing with a simulated failure of one or more engines;
- Where appropriate to the helicopter type, approach with flight control system/flight director system malfunctions, flight instrument and navigation equipment failures.

(C) Before a flight crew member without a valid instrument rating is allowed to operate in VMC at night, he/she should be required to undergo a proficiency check at night. Thereafter, each second proficiency check should be conducted at night.

(iii) Once every 12 months the checks prescribed in (b)(1)(ii)(A) may be combined with the proficiency check for revalidation or renewal of the aircraft type rating.

(iv) Operator proficiency checks should be conducted by a type rating examiner (TRE) or a synthetic flight examiner (SFE), as applicable.

(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) 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 his/her ability to 'manage' the operation and take appropriate command decisions.

(ii) The flight crew should be assessed on their CRM skills in accordance with a 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) Line checks should be conducted by a commander nominated by the operator. The operator should inform the LyCAA about the persons nominated. The person conducting the line check should occupy an observer's seat where installed. His/her CRM assessments should solely be based on observations made during the initial briefing, cabin briefing, flight crew compartment briefing and those phases where he/she occupies the observer's seat.

(A) For aeroplanes, in the case of long haul operations where additional operating flight crew are carried, the person 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.

(vi) Where a pilot is required to operate as pilot flying and pilot monitoring, he/she should be checked on one flight sector as pilot flying and on another flight sector as pilot monitoring. However, where the operator's procedures require integrated flight preparation, integrated cockpit initialisation and that each pilot performs both flying and monitoring duties on the same sector, then the line check may be performed on a single flight sector.

(4) When the operator proficiency check, line check or emergency and safety equipment check are undertaken within the final 3 calendar months of validity of a previous check, the period of validity of the subsequent check should be counted from the expiry date of the previous check.

(5) In the case of single-pilot operations with helicopters, the recurrent checks referred to in (b)(1), (2) and (3) should be performed in the single-pilot role on a particular helicopter type 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) Personnel providing training and checking

Training and checking should be provided by the following personnel:

(1) Ground and refresher training by suitably qualified personnel;

(2) Flight training 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), providing that the FI, TRI, CRI or SFI satisfies the operator's experience and knowledge requirements sufficient to instruct on the items specified in paragraphs (a)(1)(i)(A) and (B);

(3) Emergency and safety equipment training by suitably qualified personnel;

(4) CRM:

(i) Integration of CRM elements into all the phases of the recurrent training by all the personnel conducting recurrent training. The operator should ensure that all personnel conducting recurrent training are suitably qualified to integrate elements of CRM into this training;

(ii) classroom CRM training by at least one CRM trainer, qualified as specified in AMC3 ORO.FC.115, who may be assisted by experts in order to address specific areas.

(5) Recurrent checking by the following personnel:

(i) Operator proficiency check by a type rating examiner (TRE), class rating examiner (CRE) or, if the check is conducted in an FSTD, a TRE, CRE or a synthetic flight examiner (SFE), trained in CRM concepts and the assessment of CRM skills.

(ii) Emergency and safety equipment checking by suitably qualified personnel.

(e) Use of FSTD

(1) Training and checking provide an opportunity to practice 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 whenever possible.

(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.

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 his/her 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 his/her 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.

AMC1 ORO.FC.235(d) Pilot qualification to operate in either pilot's seat

SINGLE-ENGINE HELICOPTERS — AUTOROTATIVE LANDING

In the case of single-engined helicopters, the autorotative landing should be carried out from left- and right-hand seats on alternate proficiency checks.

GM1 ORO.FC.235(f);(g) 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.

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

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

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

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

ICAO Doc 9995 is the reference document for operators seeking to implement EBT. The purpose of this guidance material (GM) is to enable the implementation of EBT according to the principles established in ICAO Doc 9995 taking into account the European regulatory framework.

In the current regulatory framework it is possible to achieve a mixed implementation of EBT. Implementation of a mixed EBT programme means that some portion of the recurrent assessment and training is dedicated to the application of EBT. This includes the 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 training programme described in this GM refers to the recurrent training and checking of flight crew, including LPCs and OPCs.

The EBT training programme takes into account the differences between aircraft of different generations and the effect of these differences on training. The operator should acquire a thorough knowledge of ICAO Doc

9995 before implementing this GM. For applicability, see ICAO Doc 9995 Chapter 3.

EBT programme

Within the current regulatory framework the operator may undertake a mixed implementation of the baseline EBT programme according to this GM. The baseline EBT programme is defined in ICAO Doc 9995 Chapter 4.3.1 and in Appendices 2 to 7.

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

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

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

ICAO Doc 9995 Chapter 6, which is additional to EU regulations, contains the guidance for the training and assessment of personnel involved in the conduct of EBT.

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

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

Clusters of major failures of aircraft systems are determined by reference to malfunction characteristics and the underlying elements of crew performance required to manage them. Malfunction clustering may be used to guide the operator towards the implementation of an 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 EBT programme described in ICAO Doc 9995 contains modules with three phases: the evaluation phase, the manoeuvres training phase, and the scenario-based training phase. In order to comply with the existing regulatory framework, LPC and OPC requirements are fulfilled by a combination of the evaluation phase and the manoeuvres validation phase, which replaces the manoeuvres training phase described in ICAO Doc 9995. The manoeuvres validation phase is defined in Section 3 below. This is a form of mixed implementation, which is described as follows:

1. **Evaluation phase**: This includes check scenarios referred to in Part-FCL Appendix 9 within an accepted 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 evaluation phase is not intended to be a comprehensive assessment of all Part-FCL Appendix 9 items; nevertheless, the list below includes the items that should be included in the evaluation phase only.

Part-FCL or Part-ORO reference	Description
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.*
Part-FCL Appendix 9 Paragraph 16	*The test/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 Item1.6	*Before take-off checks.*

Part-FCL Appendix 9 Item 3.9.1*	*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.*

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 manoeuvres training phase described in ICAO Doc 9995 Chapter 7.5. 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 evaluation phase, should be included here.

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

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

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 LCARs Aircrew for class-single pilot or type-single pilot, but not within a single licence endorsement, the operator should ensure that the flight crew member does not operate more than:

(i) Three reciprocating engine aeroplane types or variants;

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

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

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

(2) When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsement, as determined by the operational suitability data established in accordance with LCARs Aircrew, 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 operational suitability data established in accordance with LCARs 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 LCARs 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 LCAR Regulation 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 LCARs for class single-pilot and type multi-pilot, the operator should comply with the following:

(i) Point (a)(2);

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

(A) Flight crew members should have completed two consecutive operator proficiency checks and should have:

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

(B) In the case of a pilot having experience with an operator and exercising the privileges of more than one licence endorsement, and then being promoted to command with the same operator on one of those types, the required minimum experience as commander is 6 months and 300 hours, and the pilot should have completed two consecutive operator proficiency checks 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 operational suitability data established in accordance with LCARs Aircrew 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 operational suitability data established in accordance with LCARs Aircrew for the relevant types or variants;

(v) Recent experience requirements established in LCARs 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 operational suitability data established in accordance with LCARs for the relevant type or variant, this should be reflected in the training required in ORO.FC.230 and:

(A) ORO.FC.230 (b) requires two operator proficiency checks every year. When credits are defined in operational suitability data established in accordance with LCARs for operator proficiency checks to alternate between the types, each operator proficiency check should revalidate the operator proficiency check for the other type(s). The operator proficiency check may be combined with the proficiency checks for revalidation or renewal of the aeroplane type rating or the instrument rating in accordance with LCARs.

(B) ORO.FC.230 (c) requires one line check every year. When credits are defined in operational suitability data established in accordance with LCARs for line checks to alternate between types or variants, each line check should revalidate the line check for the other type or variant.

(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-month 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 LCARs Aircrew 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) For helicopters with a maximum certified take-off mass (MCTOM) of more than 5 700 kg, or with 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 LCARs for the relevant types or variants;

(B) A minimum of 3 months and 150 hours experience on the type or variant 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 operational suitability data established in accordance with LCARs for the relevant types or variants;

(C) 28 days and/or 50 hours flying 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

(D) Operational suitability data established in accordance with LCARs for the relevant types or variants; and

(E) A flight crew member should not be rostered to fly more than one type or significantly different variant of a type during a single duty period.

(v) In the case of all other helicopters, the flight crew member should not operate more than three helicopter types or significantly different variants, unless credits related to the training, checking and recent experience requirements are defined in operational suitability data established in accordance with LCARs for the relevant types or variants.

(c) Combination of helicopter and aeroplane

(1) The flight crew member may fly one helicopter type or variant and one aeroplane type irrespective of their MCTOM or MOPSC.

(2) If the helicopter type is covered by paragraph (b)(1)(iv) then (b)(1)(iv)(B), (C) and (D) should also apply in this case.

AMC2 ORO.FC.240 Operation on more than one type or variant

GENERAL

(a) Terminology

The terms used in the context of the operation of more than one type or variant have the following meaning:

(1) Base aircraft means an aircraft used as a reference to compare differences with another aircraft.

(2) Variant means an aircraft or a group of aircraft within the same pilot type rating that has differences to the base aircraft requiring difference training or familiarisation training.

(3) Credit means the recognition of training, checking or recent experience based on commonalities between aircraft. For substantiation of the credits ODR tables or other appropriate documentation for comparison of the relevant aircraft characteristics may be provided.

(4) Operator difference requirements (ODRs) mean a formal description of differences between types or variants flown by a particular operator.

(b) Philosophy

The concept of operating more than one type or variant depends upon the experience, knowledge and ability of the operator and the flight crew concerned.

The first consideration is whether or not aircraft types or variants are sufficiently similar to allow the safe operation of both.

The second consideration is whether or not the types or variants are sufficiently similar for the training, checking and recent experience. Unless credits have been established by the operational suitability data in accordance with LCARs, all training, checking and recent experience requirements should be completed independently for each type or variant.

(c) Methodology – Use of Operator Difference Requirement (ODR) Tables

(1) Before assigning flight crew members to operate more than one type or variant of aircraft, 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 data established in accordance with LCARs for the relevant types or variants, and should be adapted to the operator's specific aircraft configurations. This evaluation should take into account of the following:

(i) The level of technology;

(ii) Operational procedures; and

(iii) Handling characteristics.

The methodology described below should be used as a means of evaluating aeroplane differences and similarities to justify the operation of more than one type or variant, and when credit is sought.

(2) ODR tables

Before requiring flight crew members to operate more than one type or variant, operators should first nominate one aircraft as the base aircraft from which to show differences with the second aircraft type or variant, the 'difference aircraft', in terms of technology (systems), procedures, pilot handling and aircraft management. These differences, known as operator difference requirements (ODR), 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 ODR tables should be presented as follows:

GENERAL OPERATOR DIFFERENCES REQUIREMENTS TABLE										
DIFFERENCE AIRCRAFT: BASE AIRCRAFT:				**COMPLIANCE METHOD**						
				TRAINING					**CHKG/ CURR**	
General	Differences	Flt Char	Proc Chg	A	B	C	D	E	FLT CHK	REC EXP
GENERAL	Range ETOPS Certified	No	Yes		CBT					
DIMENSIONS	Configuration per AFM, FCOM	Yes	No		CBT					
SYSTEM OPERATOR DIFFERENCES REQUIREMENTS TABLE										
DIFFERENCE AIRCRAFT: BASE AIRCRAFT:				**COMPLIANCE METHOD**						
				TRAINING					**CHKG/ CURR**	
System	Differences	Flt Char	Proc Chg	A	B	C	D	E	FLT CHK	REC EXP
21 – AIR CONDITIONING	CONTROLS AND INDICATORS: - Panel layout	No	Yes	HO						
21 - AIR CONDITIONING	PACKS: - Switch type - Automatically controlled - Reset switch for both packs	No	Yes		CBT					

MANEUVER OPERATOR DIFFERENCES REQUIREMENTS TABLE										
DIFFERENCE AIRCRAFT: BASE AIRCRAFT:				COMPLIANCE METHOD						
				TRAINING					CHKG/ CURR	
Manoeuvre	Differences	Flt Char	Proc Chg	A	B	C	D	E	FLT CHK	REC EXP
Exterior Preflight	Minor differences	No	No	H O						
Preflight Normal takeoff	Differences due to systems, ECL FBW handling vs Conventional ; AFDS TAKEOFF: - Autothrottle engagement FMA indications	No No	Yes Yes		CBT CBT	FTD	FFS			

(4) Compilation of ODR Tables

(i) ODR 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) ODR 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 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) ODR 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 ODR 1, ODR 2 and ODR 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) The final stage of an operator's proposal to operate more than one type or variant is to establish crew training, checking and currency requirements. This may be established by applying the coded difference levels from Table 4 to the compliance method column of the ODR Tables.

(B) Differences items identified in the ODR tables as impacting flight characteristics, or procedures, should be analysed in the corresponding ATA section of the ODR 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 difference between a base and a candidate aircraft with reference to the elements described in the ODR 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 to 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 Devices[1] or aircraft to accomplish specific manoeuvres	Partial proficiency check using qualified device[1]	Designated manoeuvre(s)[1]
E	FSTDs[2] or aircraft	Proficiency check using FSTDs[2] or aircraft	As per regulation, using FSTDs[2] or aircraft

Footnote ([1]):

Aeroplane: FTD Level 2, or FFS, or aeroplane

Helicopter: FTD Level 2 and 3, or FFS, or helicopter

Footnote ([2]):

Aeroplane: FFS Level C or D, or aeroplane

Helicopter: FSTD'S having dual qualification: FFS Level B and FTD Level 3, or FFS Level C or D, or helicopter

Training Levels A and B require familiarisation training, levels C and D require differences training.

Training Level E means that differences are such that type rating training is required.

(3) Difference level — Training

The training differences 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 is 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 operations 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 difference training, significant negative training cannot occur as a result of the simplification.

Appropriate devices as described in CS FCD.420(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 having such a 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 and specifies the relevant subjects, procedures or manoeuvres.

(4) Difference level — 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 not meeting initial checking requirements. In such instances the applicant may propose for revalidation checks the use of certain devices not meeting the initial check 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 representing 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 level — 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 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

(6) 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 requires 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 LyCAA.

When CTLC is permitted, any credit or constraints applicable to using FSTDs, as mentioned in CS FCD.415(a), are also to be determined.

(A) 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.

(7) 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 practice or demonstrate those manoeuvres or procedures specifying currency requirements for those manoeuvres or procedures.

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 Annex V (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;

(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 the:

(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

(1) Specific target or set of targets that have to be reached and fulfilled before the training course can be continued.

(2) Each specified target should have an associated objective that is identifiable both by the flight crew and the trainers.
(3) 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/behaviour as learnt from task analysis;
(C) Line-oriented evaluation (LOE)/ LOFT scenarios to include triggers/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 monitoring, the advanced flight data monitoring (FDM) programme and LOE/LOQE programmes. In addition, the evaluation process should 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.

(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 LyCAA.

(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 an 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 LyCAA.

The purpose of an 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 Annex V (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 Annex V (SPA.LVO), as applicable. The length of this period should be determined by the LyCAA.

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 Alternative training and qualification programme

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

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 of Commission Regulation (EU) No 965/2012.

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).

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 line-orientated evaluation (LOE) may be undertaken with other ATQP training.

(b) The line check may be combined with a line-oriented quality evaluation (LOQE).

SUBPART CC — Cabin crew

SECTION I — 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 commercial air transport 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. If a lower number is not specified, the number of cabin crew established at the time of initial type certification applies.

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 Annex V (Part-CC) to Commission Regulation (EU) No 1178/2011.

(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 t raining 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.

CRM training elements	**Operator's CRM Training**	**Operator Aircraft Type Conversion Training**	**Annual Recurrent Training**	**Senior Cabin Crew member (SCCM) Course**
General				
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	Required	Required
Relevant to the individual cabin crew member				
Personality awareness, human error and reliability, attitudes and behaviours, self- Stress and stress management; Fatigue and vigilance; Assertiveness, situation awareness, information acquisition and processing.	Not required (covered under initial training required by Part-CC)	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 (3-year cycle)	In-depth
Specifics related to aircraft types (narrow-/wide-bodied, single-/multi-deck), 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) Computer-based training

Notwithstanding (a)(3) of AMC1 ORO.CC.115(e), computer-based training may be conducted as a stand-alone training method for a cabin crew member operating on aircraft with a maximum operational passenger seating configuration of 19 or less.

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 Annex V (Part-CC) to Commission Regulation (EU) No 11 78 /2 01 1, and an operato r's CRM t raining, 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) (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

CREW RESOURCE MANAGEMENT (CRM)

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) Crew resource management (CRM) training

MINIMUM TRAINING TIMES

(a) (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; 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) 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

GM4 ORO.CC.115(e) 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 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 'rem ain o pen 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, over reactions 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

(d) 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.

(e) 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.

(f) 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?	

AMC1 ORO.CC.120(a)(1) Initial training course

NEW ENTRANTS IN OPERATIONS OTHER THAN COMMERCIAL AIR TRANSPORT OPERATIONS

(a) When a new entrant to an operator conducting operations other than commercial air transport is a cabin crew member, not holding a valid cabin crew attestation, who has already acquired experience as cabin crew in operations other than commercial air transport, 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, calls 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; and
(10) Passenger hand rail system or alternative means.

(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.
(5) (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 the CRM training covered during the operator aircraft type conversion training should be conducted by at least one cabin crew CRM trainer

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 LCARs Aircrew.

AMC1 ORO.CC.135 Familiarisation

FAMILIARISATION FLIGHTS AND AIRCRAFT FAMILIARISATION VISITS

(a) For commercial air transport 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 pre-flight, 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; and

(xiii) Doors/exits location and environment.

(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 commercial air transport, 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 instructor; 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 II 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’.

(f) 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 FLIGHTS

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.

AMC1 ORO.CC.205(c)(1) Reduction of the number of cabin crew 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.

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.

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	Familiarisation	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							

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 LCAR Regulation 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 member 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 competent and inspecting authority;

(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 fire fighting 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 time limitations

GM1 ORO.FTL.105(1) Definitions

ACCLIMATISED

(a) A crew member remains acclimatised to the local time of his/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.

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 acclimatised 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.

AMC1 ORO.FTL.120(b)(1) Fatigue risk management (FRM)

COMMERCIAL AIR TRANSPORT 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)

COMMERCIAL AIR TRANSPORT OPERATORS FRM DOCUMENTATION

The operator should develop and keep current FRM documentation that describes and records:

(a) FRM policy and objectives;

(b) FRM processes and procedures;

(c) accountabilities, responsibilities and authorities for these processes and procedures;

(d) mechanisms for on-going involvement of management, flight and cabin crew members, and all other involved personnel;

(e) FRM training programmes, training requirements and attendance records;

(f) scheduled and actual flight times, duty periods and rest periods with deviations and reasons for deviations; and

(g) FRM outputs including findings from collected data, recommendations, and actions taken.

AMC1 ORO.FTL.120(b)(4) Fatigue risk management (FRM)

COMMERCIAL AIR TRANSPORT 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 minimized. 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)

COMMERCIAL AIR TRANSPORT 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)

COMMERCIAL AIR TRANSPORT 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)(8) Fatigue risk management (FRM)

COMMERCIAL AIR TRANSPORT 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 organisational 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)(9) Fatigue risk management (FRM)

COMMERCIAL AIR TRANSPORT 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.

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.

GM1 ORO.FTL.235(a)(2) Rest periods

MINIMUM REST PERIOD AT HOME BASE IF SUITABLE ACCOMMODATION IS PROVIDED

An operator may apply the minimum rest period away from home base during a rotation which includes a rest period at a crew member's home base. This applies only if the crew member does not rest at his/her residence, or temporary accommodation, because the operator provides suitable accommodation. This type of roster is known as "back-to-back operation".

AMC1 ORO.FTL.235(b) Rest periods

MINIMUM REST PERIOD AWAY FROM HOME BASE

The time allowed for physiological needs should be 1 hour. Consequently, if the travelling time to the suitable accommodation is more than 30 minutes, the operator should increase the rest period by twice the amount of difference of travelling time above 30 minutes.

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.

Appendix 1 to AMC1 ORO.GEN.160-Occurrence Reporting

1. INTENT

This AMC is interpretative material and provides guidance in order to determine which occurrences should be reported to the Agency, national authorities and to other organisations,

and it provides guidance on the timescale for submission of such reports.

It also describes the objective of the overall occurrence reporting system including internal and external functions

2. APPLICABILITY

(a) This AMC only applies to occurrence reporting by persons/organisations regulated by Regulation (EC) No 1592/2002 of the European Parliament and of the Council. It does not address reporting by aerodrome organisations, air navigation service providers and authorities themselves.

(b) In most cases the obligation to report is on the holders of a certificate or approval, which in most cases are organisations, but in some cases can be a single person. In addition some reporting requirements are directed to persons. However, in order not to complicate the text, only the term ‘organisation’ is used.

(c) The AMC also does not apply to dangerous goods reporting. The definition of reportable dangerous goods occurrences is different from the other occurrences and the reporting system is also separate. This subject is covered in specific operating requirements and guidance and ICAO Documents namely:

(i) ICAO Annex 18, The safe Transport of Dangerous Goods by Air, Chapter 12

(ii) ICAO Doc 9284-AN/905, Technical Instructions for the Safe Transport of Dangerous Goods by Air

3. 3. OBJECTIVE OF OCCURRENCE REPORTING

(a) The occurrence reporting system is an essential part of the overall monitoring function. The objective of the occurrence reporting, collection, investigation and analysis systems described in the operating rules, and the airworthiness rules is to use the reported information to contribute to the improvement of aviation safety, and not to attribute blame, impose fines or take other enforcement actions.

(b) The detailed objectives of the occurrence reporting systems are:

(i) To enable an assessment of the safety implications of each occurrence to be made, including previous similar occurrences, so that any necessary action can be initiated. This includes determining what and why it had occurred and what might prevent a similar occurrence in the future.

(ii) To ensure that knowledge of occurrences is disseminated so that other persons and organisations may learn from them.

(c) The occurrence reporting system is complementary to the normal day to day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The occurrence reporting system is a tool to identify those occasions where routine procedures have failed.

(d) Occurrences should remain in the database when judged reportable by the person submitting the report as the significance of such reports may only become obvious at a later date.

4. 4. REPORTING TO THE AGENCY AND NATIONAL AUTHORITIES

(a) Requirements

(i) As detailed in the operating rules, occurrences defined as an incident, malfunction, defect, technical defect or exceedence of technical limitations that endangers or could endanger the safe operation of the aircraft must be reported to the national authority.

(ii) The products and part and appliances design rules prescribe that occurrences defined as a failure, malfunction, defect or other occurrence which has resulted in or may result in an unsafe condition must be reported to the Agency.

(iii) According to the product and part and appliances production rules occurrences defined as a deviation which could lead to an unsafe condition must be reported to the Agency and the national authority.

(iv) The maintenance rules stipulate that occurrences defined as any condition of the aircraft or aircraft component that has resulted or may result in an unsafe condition that could seriously hazard the aircraft must be reported to the national authority.

(v) Reporting does not remove the reporter's or organisation's responsibility to commence corrective actions to prevent similar occurrences in the future. Known and planned preventive actions should be included within the report.

(b) Paragraph 10.g. of this AMC provides guidance as to what should be reported by an organisation to the authority. The list of criteria provided may be used as guidance for establishing which occurrences shall be reported by which organisation. For example, the organisation responsible for the design will not need to report certain operational occurrences that it has been made aware of, if the continuing airworthiness of the product is not involved.

5. NOTIFICATION OF ACCIDENTS AND SERIOUS INCIDENTS

In addition to the requirement to notify the appropriate accident investigating authorities directly of any accident or serious incident, operators should also report to the national authority in charge of supervising the reporting organisation

6. REPORTING TIME

(a) The period of 72 hours is normally understood to start from when the occurrence took place or from the time when the reporter determined that there was, or could have been, a potentially hazardous or unsafe condition.

(b) For many occurrences there is no evaluation needed; it must be reported. However, there will be occasions when, as part of a Flight Safety and Accident Prevention programme or Quality Programme, a previously non-reportable occurrence is determined to be reportable

(c) Within the overall limit of 72 hours for the submission of a report, the degree of urgency should be determined by the level of hazard judged to have resulted from the occurrence:

(i) Where an occurrence is judged to have resulted in an immediate and particularly significant hazard the Agency and/or national authority expects to be advised immediately, and by the fastest possible means (e.g. telephone, fax, telex, e-mail) of whatever details are available at that time. This initial notification should then be followed up by a report within 72 hours.

(ii) Where the occurrence is judged to have resulted in a less immediate and less significant hazard, report submission may be delayed up to the maximum of 72 hours in order to provide more details or more reliable information.

7. CONTENT OF REPORTS

(a) Notwithstanding other required reporting means as promulgated in national requirements (e.g. AIRPROX reporting), reports may be transmitted in any form considered acceptable to the Agency and/or national authority. The amount of information in the report should be commensurate with the severity of the occurrence. Each report should at least contain the following elements, as applicable to each organisation:

(i) Organisation name

(ii) Approval reference (if relevant)

(iii) Information necessary to identify the aircraft or part affected.

(iv) Date and time if relevant

(v) A written summary of the occurrence

(vi) Any other specific information required

(b) For any occurrence involving a system or component, which is monitored or protected by a warning and/or protection system (for example: fire detection/extinguishing) the occurrence report should always state whether such system(s) functioned properly.

8. NOTIFICATION TO OTHER AGENCIES

For approved operations organisations, in addition to reporting occurrences to the national authority, the following agencies should also be notified in specific cases:

(a) Reports relating to 'security incidents' should also be notified to the appropriate local security agency

(b) Reports relating to air traffic, aerodrome occurrences or bird strikes should also be notified to the appropriate air navigation , aerodrome or ground agency

(c) Requirements for reporting and assessment of safety occurrences in ATM within the ECAC Region are harmonised within EUROCONTROL document ESARR 2.

9. REPORTING BETWEEN ORGANISATIONS

(a) Requirements exist that address the reporting of data relating to unsafe or unairworthy conditions. These reporting lines are:

(i) Production Organisation to the organisation responsible for the design;

(ii) Maintenance organisation to the organisation responsible for the design;

(iii) Maintenance organisation to operator;

(iv) Operator to organisation responsible for the design;

(v) Production organisation to production organisation.

(b) The 'Organisation responsible for the design' is a general term, which can be any one or a combination of the following organisations

(i) Holder of Type Certificate (TC) of an Aircraft, Engine or Propeller;

(ii) Holder of a Supplemental Type Certificate (STC) on an Aircraft, Engine or Propeller;

(iii) Holder of a European Technical Standard Order (ETSO) Authorisation; or

(iv) Holder of a European Part Approval (EPA)

(c) If it can be determined that the occurrence has an impact on or is related to an aircraft component which is covered by a separate design approval (TC, STC, ETSO or EPA), then the holders of such approval/authorisation should be informed. If an occurrence happens on a component which is covered by an TC, STC, ETSO or EPA (e.g. during maintenance), then only that TC, STC, ETSO Authorisation or EPA holder needs to be informed.

(d) The form and timescale for reports to be exchanged between organisations is left for individual organisations to determine. What is important is that a relationship exists between the organisations to ensure that there is an exchange of information relating to occurrences.

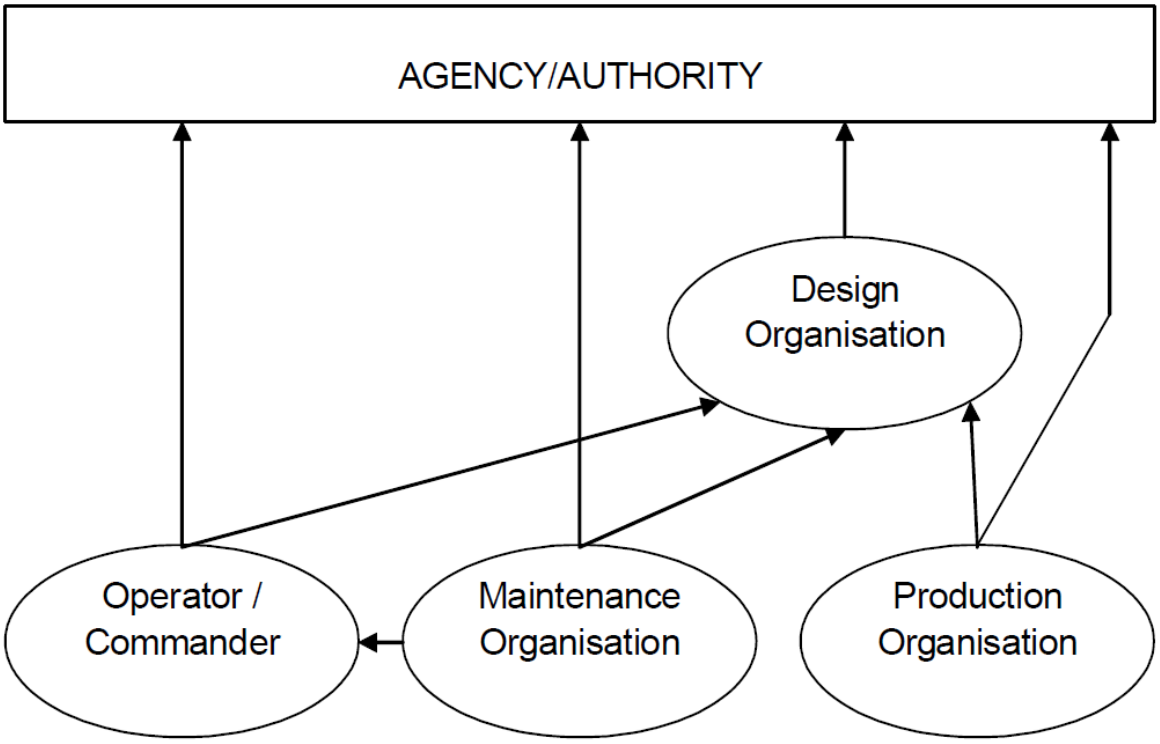
(e) Paragraph 10.g. of this AMC provides guidance as to what should be reported by an organisation to the authority. The list of criteria provided may be used as guidance for establishing which occurrences shall be reported to which organisation. For example, certain operational occurrences will not need to be reported by an operator to the design or production organisation.

10. REPORTABLE OCCURRENCES

(a) *General*. There are different reporting requirements for operators (and/or commanders), maintenance organisations, design organisations and production organisations. Moreover, as explained in paragraph 4. and 9. above, there are not only requirements for reporting to the Agency and national authority, but also for reporting to other (private) entities. The criteria for all these different reporting lines are not the same. For example the authority will not receive the same kind of reports from a design organisation as from an operator. This is a reflection of the different perspectives of the organisations based on their activities.

Figure 1 presents a simplified scheme of all reporting lines.

Figure 1



(b) *Operations and Maintenance.* The list of examples of reportable occurrences offered below under g. is established from the perspective of primary sources of occurrence information in the operational area (operators and maintenance organisations) to provide guidance for those persons developing criteria for individual organisations on what they need to report to the Agency and/or national authority. The list is neither definitive nor exhaustive and judgement by the reporter of the degree of hazard or potential hazard involved is essential.

(c) (c) *Design*. The list of examples will not be used by design organisations directly for the purpose of determining when a report has to be made to the authority, but it can serve as guidance for the establishment of the system for collecting data. After receipt of reports from the primary sources of information, designers will normally perform some kind of analysis to determine whether an occurrence has resulted or may result in an unsafe condition and a report to the authority should be made. An analysis method for determining when an unsafe condition exists in relation to continuing airworthiness is detailed in the AMC's regarding the issuance of Airworthiness Directives.

(d) (d) *Production*. The list of examples is not applicable to the reporting obligation of production organisations. Their primary concern is to inform the design organisation of deviations. Only in cases where an analysis in conjunction with that design organisation shows that the deviation could lead to an unsafe condition, should a report be made to the Agency and/or national authority (see also c. above).

(e) (e) *Customised list.* Each approval, certificate, authorisation other than those mentioned in sub paragraph c and d above, should develop a customised list adapted to its aircraft, operation or product. The list of reportable occurrences applicable to an organisation is usually published within the organisation's expositions/handbooks/manuals

(f) (f) *Internal reporting*. The perception of safety is central to occurrence reporting. It is for each organisation to determine what is safe and what is unsafe and to develop its reporting system on that basis. The organisation should establish an internal reporting system whereby reports are centrally collected and reviewed to establish which reports meet the criteria for occurrence reporting to the Agency and/or national authority and other organisations, as required.

(g) (g) *List of examples of reportable occurrences*

The following is a generic list. Not all examples are applicable to each reporting organisation.

Therefore each organisation should define and agree with the Agency and/or national authority a specific list of reportable occurrences or a list of more generic criteria, tailored to its activity and scope of work (see also 10.e above). In establishing that customised list, the organisation should take into account the following considerations:

Reportable occurrences are those where the safety of operation was or could have been endangered or which could have led to an unsafe condition. If in the view of the reporter an occurrence did not hazard the safety of the operation but if repeated in different but likely circumstances would create a hazard, then a report should be made. What is judged to be reportable on one class of product, part or appliance may not be so on another and the absence or presence of a single factor, human or technical, can transform an occurrence into a serious incident or accident.

Specific operational approvals, e.g. RVSM, ETOPS, RNAV, or a design or maintenance programme, may have specific reporting requirements for failures or malfunctions associated with that approval or programme.

A lot of the qualifying adjectives like 'significant' have been deleted from the list. In stead it is expected that all examples are qualified by the reporter using the general criteria that are applicable in his field, and specified in the requirement. (e.g. for operators: 'hazards or could have hazarded the operation')

CONTENTS:

II. AIRCRAFT TECHNICAL

III. AIRCRAFT MAINTENANCE AND REPAIR

IV. IV AIR NAVIGATION SERVICES, FACILITIES AND GROUND SERVICES

I. AIRCRAFT FLIGHT OPERATIONS

A. Operation of the Aircraft

(1)

(a) Risk of collision with an aircraft, terrain or other object or an unsafe situation when avoidance action would have been appropriate.

(b) An avoidance manoeuvre required to avoid a collision with an aircraft, terrain or other object.

(c) An avoidance manoeuvre to avoid other unsafe situations.

(2) Take-off or landing incidents, including precautionary or forced landings.Incidents such as under-shooting, overrunning or running off the side of runways. Take-offs, rejected take-offs, landings or attempted landings on a closed, occupied or incorrect runway. Runway incursions.

(3) Inability to achieve predicted performance during take-off or initial climb.

(4) Critically low fuel quantity or inability to transfer fuel or use total quantity of usable fuel.

(5) Loss of control (including partial or temporary loss of control) from any cause.

(6) Occurrences close to or above V1 resulting from or producing a hazardous or potentially hazardous situation (e.g. rejected take-off, tail strike, engine power loss etc.).

(7) Go-around producing a hazardous or potentially hazardous situation.

(8) Unintentional significant deviation from airspeed, intended track or altitude. (more than 91 m (300 ft)) from any cause.

(9) Descent below decision height/altitude or minimum descent height/altitude without the required visual reference.

(10) Loss of position awareness relative to actual position or to other aircraft.

(11) Breakdown in communication between flight crew (CRM) or between Flight crew

(a) and other parties (cabin crew, ATC, engineering).

(12) Heavy landing - a landing deemed to require a 'heavy landing check'.

(13) Exceedance of fuel imbalance limits.

(14) Incorrect setting of an SSR code or of an altimeter subscale.

(15) Incorrect programming of, or erroneous entries into, equipment used for navigation or performance calculations, or use of incorrect data.

(16) Incorrect receipt or interpretation of radiotelephony messages.

(17) Fuel system malfunctions or defects, which had an effect on fuel supply and/or distribution.

(18) Aircraft unintentionally departing a paved surface.

(19) Collision between an aircraft and any other aircraft, vehicle or other ground object.

(20) Inadvertent and/or incorrect operation of any controls.

(21) Inability to achieve the intended aircraft configuration for any flight phase (e.g.landing gear and doors, flaps, stabilisers, slats etc).

(22) A hazard or potential hazard which arises as a consequence of any deliberate simulation of failure conditions for training, system checks or training purposes.

(23) Abnormal vibration.

(24) Operation of any primary warning system associated with manoeuvring of the aircraft e.g. configuration warning, stall warning (stick shake), over speed warning etc. unless:

(a) the crew conclusively established that the indication was false. Provided that the false warning did not result in difficulty or hazard arising from the crew response to the warning; or

(b) operated for training or test purposes.

(25) GPWS/TAWS 'warning' when:

(a) the aircraft comes into closer proximity to the ground than had been planned or anticipated; or

(b) the warning is experienced in IMC or at night and is established as having been triggered by a high rate of descent (Mode 1); or

(c) the warning results from failure to select landing gear or land flap by the appropriate point on the approach (Mode 4); or

(d) any difficulty or hazard arises or might have arisen as a result of crew response to the 'warning' e.g. possible reduced separation from other traffic.This could include warning of any Mode or Type i.e. genuine, nuisance or false.

(26) GPWS/TAWS 'alert' when any difficulty or hazard arises or might have arisen as a result of crew response to the 'alert'.

(27) ACAS RAs.

(28) Jet or prop blast incidents resulting in significant damage or serious injury.

B. Emergencies

(1) Fire, explosion , smoke or toxic or noxious fumes, even though fires were extinguished.

(2) The use of any non-standard procedure by the flight or cabin crew to deal with an emergency when:

(a) the procedure exists but is not used; or

(b) a procedure does not exist; or

(c) the procedure exists but is incomplete or inappropriate; or

(d) the procedure is incorrect; or

(e) the incorrect procedure is used.

(3) Inadequacy of any procedures designed to be used in an emergency, including when being used for maintenance, training or test purposes.

(4) An event leading to an emergency evacuation.

(5) Depressurisation.

(6) The use of any emergency equipment or prescribed emergency procedures in order to deal with a situation.

(7) An event leading to the declaration of an emergency ('Mayday' or 'Pan').

(8) Failure of any emergency system or equipment, including all exit doors and lighting, to perform satisfactorily, including when being used for maintenance, training or test purposes.

(9) Events requiring any emergency use of oxygen by any crew member.

C. Crew Incapacitation

(1) Incapacitation of any member of the flight crew, including that which occurs prior to departure if it is considered that it could have resulted in incapacitation after take-off.

(2) Incapacitation of any member of the cabin crew which renders them unable to perform essential emergency duties.

D. Injury

(1) Occurrences, which have or could have led to significant injury to passengers or crew but which are not considered reportable as an accident.

E. Meteorology

(1) A lightning strike which resulted in damage to the aircraft or loss or malfunction of any essential service.

(2) A hail strike which resulted in damage to the aircraft or loss or malfunction of any essential service.

(3) Severe turbulence encounter – an encounter resulting in injury to occupants or deemed to require a 'turbulence check' of the aircraft.

(4) A windshear encounter

(5) Icing encounter resulting in handling difficulties, damage to the aircraft or loss or malfunction of any essential service.

F. Security

(1) Unlawful interference with the aircraft including a bomb threat or hijack.

(2) Difficulty in controlling intoxicated, violent or unruly passengers.

(3) Discovery of a stowaway.

G. Other Occurrences

(1) Repetitive instances of a specific type of occurrence which in isolation would not be considered 'reportable' but which due to the frequency at which they arise, form a potential hazard.

(2) A bird strike which resulted in damage to the aircraft or loss or malfunction of any essential service.

(3) Wake turbulence encounters.

(4) Any other occurrence of any type considered to have endangered or which might have endangered the aircraft or its occupants on board the aircraft or on the ground.

II. AIRCRAFT TECHNICAL

A. Structural

Not all structural failures need to be reported. Engineering judgement is required to decide whether a failure is serious enough to be reported. The following examples can be taken into consideration:

(1) Damage to a Principal Structural Element that has not been qualified as damage tolerant (life limited element). Principal Structural Elements are those which contribute significantly to carrying flight, ground, and pressurisation loads, and whose failure could result in a catastrophic failure of the aircraft. Typical examples of such elements are listed for large aeroplanes in AC/AMC 25.571(a) "damage tolerance and fatigue evaluation of structure", and in the equivalent AMC material for rotorcraft.

(2) Defect or damage exceeding admissible damages to a Principal Structural Element that has been qualified as damage tolerant.

(3) Damage to or defect exceeding allowed tolerances of a structural element which failure could reduce the structural stiffness to such an extent that the required flutter, divergence or control reversal margins are no longer achieved

(4) Damage to or defect of a structural element, which could result in the liberation of items of mass that may injure occupants of the aircraft.

(5) Damage to or defect of a structural element, which could jeopardise proper operation of systems. See paragraph II.B. below.

(6) Loss of any part of the aircraft structure in flight.

B. Systems

The following generic criteria applicable to all systems are proposed:

(1) Loss, significant malfunction or defect of any system, subsystem or set of equipment when standard operating procedures, drills etc. could not be satisfactorily accomplished.

(2) Inability of the crew to control the system, e.g.:

(a) uncommanded actions;

(b) incorrect and or incomplete response, including limitation of movement or stiffness;

(c) runaway;

(d) mechanical disconnection or failure.

(3) Failure or malfunction of the exclusive function(s) of the system (one system could integrate several functions).

(4) Interference within or between systems.

(5) Failure or malfunction of the protection device or emergency system associated with the system.

(6) Loss of redundancy of the system.

(7) Any occurrence resulting from unforeseen behaviour of a system.

(8) For aircraft types with single main systems, subsystems or sets of equipment: Loss, significant malfunction or defect in any main system, subsystem or set of equipment.

(9) For aircraft types with multiple independent main systems, subsystems or sets of equipment: The loss, significant malfunction or defect of more than one main system, subsystem or set of equipment

(10) Operation of any primary warning system associated with aircraft systems or equipment unless the crew conclusively established that the indication was false provided that the false warning did not result in difficulty or hazard arising from the crew response to the warning.

(11) Leakage of hydraulic fluids, fuel, oil or other fluids which resulted in a fire hazard or possible hazardous contamination of aircraft structure, systems or equipment, or risk to occupants.

(12) Malfunction or defect of any indication system when this results in the possibility of misleading indications to the crew.

(13) Any failure, malfunction or defect if it occurs at a critical phase of flight and relevant to the operation of that system.

(14) Occurrences of significant shortfall of the actual performances compared to the approved performance which resulted in a hazardous situation (taking into account the accuracy of the performance calculation method) including braking action, fuel consumption etc.

(15) Asymmetry of flight controls; e.g. flaps, slats, spoilers etc.

C. Propulsion (including Engines, Propellers and Rotor Systems) and APUs

(1) Flameout, shutdown or malfunction of any engine.

(2) Overspeed or inability to control the speed of any high speed rotating component (for example: Auxiliary power unit, air starter, air cycle machine, air turbine motor, propeller or rotor).

(3) Failure or malfunction of any part of an engine or powerplant resulting in any one or more of the following:
  (a) non containment of components/debris;
  (b) uncontrolled internal or external fire, or hot gas breakout;
  (c) thrust in a different direction from that demanded by the pilot;
  (d) thrust reversing system failing to operate or operating inadvertently;
  (e) inability to control power, thrust or rpm;
  (f) failure of the engine mount structure;
  (g) partial or complete loss of a major part of the powerplant;
  (h) Dense visible fumes or concentrations of toxic products sufficient to incapacitate crew or passengers;
  (i) inability, by use of normal procedures, to shutdown an engine;
  (j) inability to restart a serviceable engine.

(4) An uncommanded thrust/power loss , change or oscillation which is classified as a loss of thrust or power control (LOTC) as defined in AMC 20-1:
  (a) for a single engine aircraft; or
  (b) where it is considered excessive for the application, or
  (c) where this could affect more than one engine in a multi-engine aircraft, particularly in the case of a twin engine aircraft; or
  (d) for a multi engine aircraft where the same, or similar, engine type is used in an application where the event would be considered hazardous or critical.

(5) Any defect in a life controlled part causing retirement before completion of its full life.

(6) Defects of common origin which could cause an in flight shut down rate so high that there is the possibility of more than one engine being shut down on the same flight.

(7) An engine limiter or control device failing to operate when required or operating inadvertently.

(8) exceedance of engine parameters.

(9) FOD resulting in damage.

Propellers and -transmission

(10) Failure or malfunction of any part of a propeller or powerplant resulting in any one or more of the following:
  (a) an overspeed of the propeller;
  (b) the development of excessive drag;
  (c) a thrust in the opposite direction to that commanded by the pilot;
  (d) a release of the propeller or any major portion of the propeller;
  (e) a failure that results in excessive unbalance;
  (f) the unintended movement of the propeller blades below the established minimum in-flight low-pitch position;
  (g) an inability to feather the propeller;
  (h) an inability to command a change in propeller pitch;
  (i) an uncommanded change in pitch;
  (j) an uncontrollable torque or speed fluctuation;
  (k) The release of low energy parts.

Rotors and -transmission

(11) Damage or defect of main rotor gearbox / attachment which could lead to in flight separation of the rotor assembly, and /or malfunctions of the rotor control.

(12) Damage to tail rotor, transmission and equivalent systems.

APUs

(13) Shut down or failure when the APU is required to be available by operational requirements, e.g. ETOPS, MEL.

(14) Inability to shut down the APU.

(15) Overspeed.

(16) Inability to start the APU when needed for operational reasons.

D. Human Factors

(1) Any incident where any feature or inadequacy of the aircraft design could have led to an error of use that could contribute to a hazardous or catastrophic effect.

E. Other Occurrences

(1) Any incident where any feature or inadequacy of the aircraft design could have led to an error of use that could contribute to a hazardous or catastrophic effect.

(2) An occurrence not normally considered as reportable (for example, furnishing and cabin equipment, water systems), where the circumstances resulted in endangering of the aircraft or its occupants.

(3) A fire, explosion, smoke or toxic or noxious fumes.

(4) Any other event which could hazard the aircraft, or affect the safety of the occupants of the aircraft, or people or property in the vicinity of the aircraft or on the ground.

(5) Failure or defect of passenger address system resulting in loss or inaudible passenger address system.

(6) Loss of pilots seat control during flight.

III. AIRCRAFT MAINTENANCE AND REPAIR

A. Incorrect assembly of parts or components of the aircraft found during an inspection or test procedure not intended for that specific purpose.

B. Hot bleed air leak resulting in structural damage.

C. Any defect in a life controlled part causing retirement before completion of its full life.

D. Any damage or deterioration (i.e. fractures, cracks, corrosion, delamination, disbonding etc) resulting from any cause (such as flutter, loss of stiffness or structural failure) to:

(1) primary structure or a principal structural element (as defined in the manufacturers' Repair Manual) where such damage or deterioration exceeds allowable limits specified in the Repair Manual and requires a repair or complete or partial replacement of the element;

(2) secondary structure which consequently has or may have endangered the aircraft;

(3) the engine, propeller or rotorcraft rotor system.

E. Any failure, malfunction or defect of any system or equipment, or damage or deterioration found as a result of compliance with an Airworthiness Directive or other mandatory instruction issued by a Regulatory Authority, when:

(1) it is detected for the first time by the reporting organisation implementing compliance;

(2) on any subsequent compliance where it exceeds the permissible limits quoted in the instruction and/or published repair/rectification procedures are not available.

F. Failure of any emergency system or equipment, including all exit doors and lighting, to perform satisfactorily, including when being used for maintenance or test purposes.
G. Non compliance or significant errors in compliance with required maintenance procedures.
H. Products, parts, appliances and materials of unknown or suspect origin.
I. Misleading, incorrect or insufficient maintenance data or procedures that could lead to maintenance errors.
J. Failure, malfunction or defect of ground equipment used for test or checking of aircraft systems and equipment when the required routine inspection and test procedures did not clearly identify the problem when this results in a hazardous situation.

IV. AIR NAVIGATION SERVICES, FACILITIES AND GROUND SERVICES

A. Air Navigation Services

(1) Provision of significantly incorrect, inadequate or misleading information from any ground sources, e.g. Air Traffic Control (ATC), Automatic Terminal Information Service (ATIS), Meteorological Services, navigation databases, maps, charts, manuals, etc.
(2) Provision of less than prescribed terrain clearance.
(3) Provision of incorrect pressure reference data (i.e. altimeter setting).
(4) Incorrect transmission, receipt or interpretation of significant messages when this results in a hazardous situation.
(5) Separation minima infringement.
(6) Unauthorised penetration of airspace.
(7) Unlawful radio communication transmission.
(8) Failure of ANS ground or satellite facilities.
(9) Major ATC/ Air Traffic Management (ATM) failure or significant deterioration of aerodrome infrastructure.
(10) Aerodrome movement areas obstructed by aircraft, vehicles, animals or foreign objects, resulting in a hazardous or potentially hazardous situation.
(11) Errors or inadequacies in marking of obstructions or hazards on aerodrome movement areas resulting in a hazardous situation.
(12) Failure, significant malfunction or unavailability of airfield lighting.

B. Aerodrome and Aerodrome Facilities

(1) Significant spillage during fuelling operations.
(2) Loading of incorrect fuel quantities likely to have a significant effect on aircraft endurance, performance, balance or structural strength.
(3) unsatisfactory ground de-icing / anti-icing

C. Passenger Handling, Baggage and Cargo

(1) Significant contamination of aircraft structure, or systems and equipment arising from the carriage of baggage or cargo.
(2) Incorrect loading of passengers, baggage or cargo, likely to have a significant effect on aircraft mass and/or balance.
(3) Incorrect stowage of baggage or cargo (including hand baggage) likely in any way to hazard the aircraft, its equipment or occupants or to impede emergency evacuation.
(4) Inadequate stowage of cargo containers or other substantial items of cargo.
(5) Dangerous goods incidents reporting: see operating rules.

D. Aircraft Ground Handling and Servicing

(1) Failure, malfunction or defect of ground equipment used for test or checking of aircraft systems and equipment when the required routine inspection and test procedures did not clearly identify the problem when this results in a hazardous situation.

(2) Non compliance or significant errors in compliance with required servicing procedures.

(3) Loading of contaminated or incorrect type of fuel or other essential fluids (including oxygen and potable water).

Reportable occurrences to specific systems

The following subparagraphs give examples of reportable occurrences resulting from the application of the generic criteria to specific systems listed in paragraph 10.g. II.B of this AMC.

(1) Air conditioning/ventilation
  (a) complete loss of avionics cooling
  (b) depressurisation

(2) Autoflight system
  (a) failure of the autoflight system to achieve the intended operation while engaged
  (b) significant reported crew difficulty to control the aircraft linked to autoflight system functioning
  (c) failure of any autoflight system disconnect device
  (d) Uncommanded autoflight mode change

(3) Communications
  (a) failure or defect of passenger address system resulting in loss or inaudible passenger address
  (b) total loss of communication in flight

(4) Electrical system
  (a) loss of one electrical system distribution system (AC or DC)
  (b) total loss or loss or more than one electrical generation system
  (c) failure of the back up (emergency) electrical generating system

(5) Cockpit/Cabin/Cargo
  (a) pilot seat control loss during flight
  (b) failure of any emergency system or equipment, including emergency evacuation signalling system , all exit doors , emergency lighting, etc
  (c) loss of retention capability of the cargo loading system

(6) Fire protection system
  (a) fire warnings, except those immediately confirmed as false
  (b) undetected failure or defect of fire/smoke detection/protection system, which could lead to loss or reduced fire detection/protection
  (c) absence of warning in case of actual fire or smoke

(7) Flight controls
  (a) Asymmetry of flaps, slats, spoilers etc.
  (b) limitation of movement, stiffness or poor or delayed response in the operation of primary flight control systems or their associated tab and lock systems
  (c) flight control surface run away
  (d) flight control surface vibration felt by the crew
  (e) mechanical flight control disconnection or failure

(f) significant interference with normal control of the aircraft or degradation of flying qualities

(8) Fuel system

(a) fuel quantity indicating system malfunction resulting in total loss or erroneous indicated fuel quantity on board

(b) leakage of fuel which resulted in major loss, fire hazard , significant contamination

(c) malfunction or defects of the fuel jettisoning system which resulted in inadvertent loss of significant quantity, fire hazard, hazardous contamination of aircraft equipment or inability to jettison fuel

(d) fuel system malfunctions or defects which had a significant effect on fuel supply and/or distribution

(e) inability to transfer or use total quantity of usable fuel

(9) Hydraulics

(a) loss of one hydraulic system (ETOPS only)

(b) failure of the isolation system to operate

(c) loss of more than one hydraulic circuits

(d) failure of the back up hydraulic system

(e) inadvertent Ram Air Turbine extension

(10) Ice detection/protection system

(a) undetected loss or reduced performance of the anti-ice/de-ice system

(b) loss of more than one of the probe heating systems

(c) inability to obtain symmetrical wing de icing

(d) abnormal ice accumulation leading to significant effects on performance or handling qualities

(e) (e) crew vision significantly affected

(11) Indicating/warning/recording systems

(a) malfunction or defect of any indicating system when the possibility of significant misleading indications to the crew could result in an inappropriate crew action on an essential system

(b) loss of a red warning function on a system

(c) for glass cockpits: loss or malfunction of more than one display unit or computer involved in the display/warning function

(12) Landing gear system /brakes/tyres

(a) brake fire

(b) significant loss of braking action

(c) unsymmetrical braking leading to significant path deviation

(d) failure of the L/G free fall extension system (including during scheduled tests)

(e) unwanted gear or gear doors extension/retraction

(f) multiple tyres burst

(13) Navigation systems (including precision approaches system) and air data systems

(a) total loss or multiple navigation equipment failures

(b) total failure or multiple air data system equipment failures

(c) significant misleading indication

(d) Significant navigation errors attributed to incorrect data or a database coding error

(e) Unexpected deviations in lateral or vertical path not caused by pilot input.

(f) Problems with ground navigational facilities leading to significant navigation errors not associated with transitions from inertial navigation mode to radio navigation mode.

(14) Oxygen

(a) for pressurised aircraft: loss of oxygen supply in the cockpit

(b) loss of oxygen supply to a significant number of passengers (more than 10%), including when found during maintenance or training or test purposes

(15) Bleed air system

(a) hot bleed air leak resulting in fire warning or structural damage

(b) loss of all bleed air systems

(c) failure of bleed air leak detection system

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