



REPUBLIC OF MAURITIUS

**DEPARTMENT OF CIVIL AVIATION**

Sir Seewoosagur Ramgoolam International Airport, Plaine Magnien

# **MAURITIUS CIVIL AVIATION REQUIREMENTS**

## **MCAR PART – ORA**

### **Organisation Requirements for Aircrew**

**ISSUE 1 | REV 1**

**10 April 2025**

# DEPARTMENT OF CIVIL AVIATION

## MCAR-PART-ORA

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### FOREWORD

These requirements are issued by the Authority pursuant to the provisions of Regulations 135 of the Civil Aviation Regulations and addresses the certification and administration of Approved Training Organisations (ATO), organisations operating Flight Simulation Training Devices (FSTD) and Aero-medical Centres (AEMC).

The use of an ATO for the training and qualification of Aircrew personnel is common in modern aviation, most particularly as operators upgrade their aircraft inventory and Aircrew transition to new aircraft.

Mauritius has ATO located in the country; the requirements for ATO operation do apply to the standards required for adequate training for qualification for a Mauritius certification. Also, Mauritian citizens who receives training from a foreign ATO should be trained by an ATO conforming to Mauritius standards. The requirements set forth herein will allow for this situation.

The requirements are the regulatory requirements which the Training Organisation must comply with, as applicable to his scope of activity and operators should demonstrate full compliance by 20 October 2025.

This MCAR Part-ORA is aligned on the EU Aircrew regulations as amended, EASA decisions & AMC, and ICAO Doc & Annexes.

The Authority may amend these requirements whenever it is determined that aviation safety requires such amendment.



**I POKHUN**

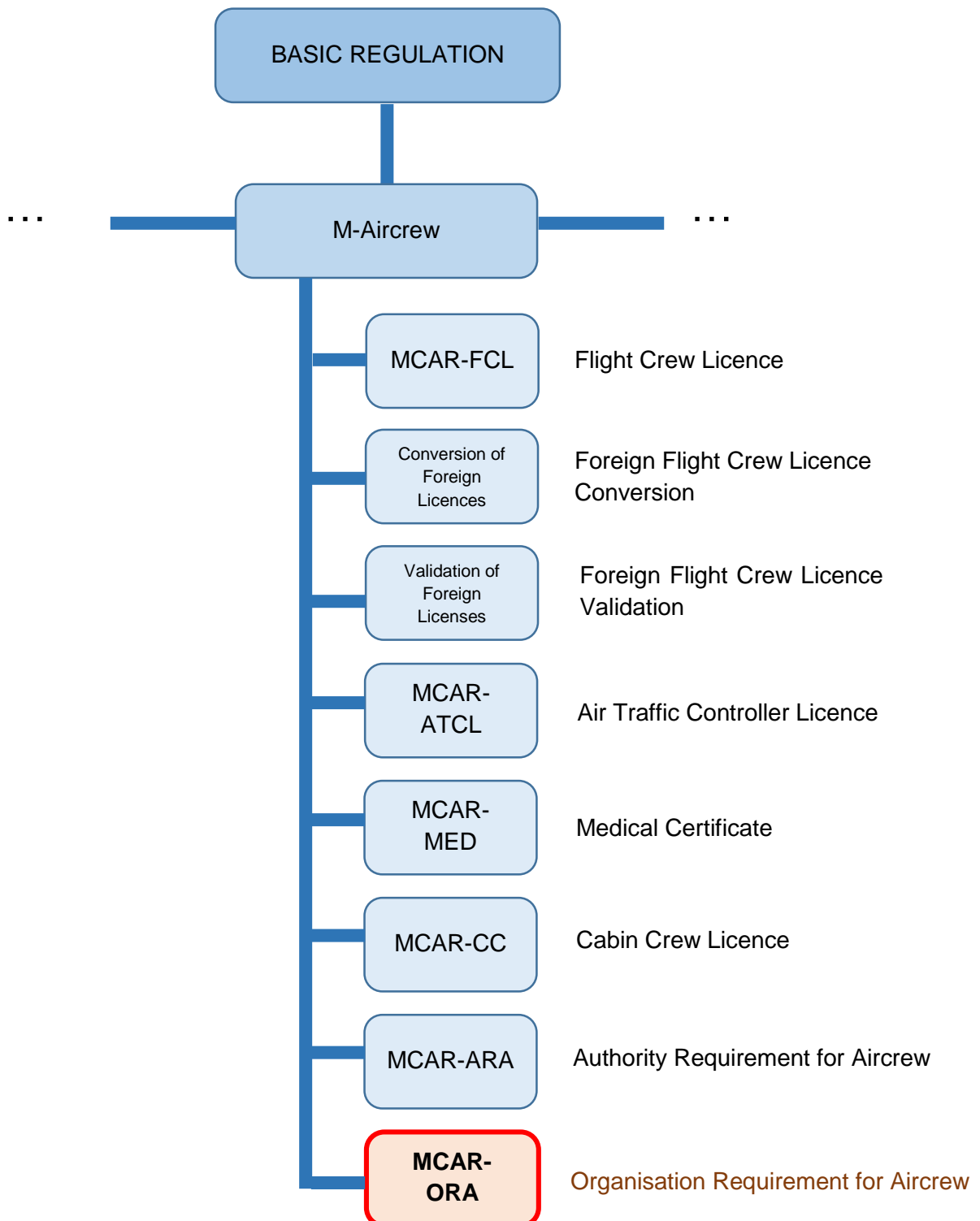
**Director of Civil Aviation**

# DEPARTMENT OF CIVIL AVIATION

## MCAR-PART-ORA

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### M-AIRCREW CHART



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**MCAR-PART-ORA**

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**AMMENDMENT RECORD**

<b>Amendment No.</b>	<b>Date of issue</b>	<b>Date entered</b>	<b>Entered by</b>
Issue 1	01 February 2021	01 February 2021	DCA - FOI
Issue 1 Rev 1	10 April 2025	10 April 2025	DCA - FOI

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#### NOTE

The content of this document is arranged as follows: the cover regulation (recitals and articles) with the implementing requirement (IR) or delegated act (DA) points, as regulation, appear first, followed by the related acceptable means of compliance (AMC) and guidance material (GM) paragraph(s).

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

<b>Regulation</b>
<b>Acceptable means of compliance</b>
<b>Guidance material</b>

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### ABBREVIATIONS / DEFINITIONS

The following abbreviations are within this MCAR Part-ORA:

AME	Aero-Medical Examiner
AOC	Air Operator Certificate
ATO	Approved Training Organisation
ATPL	Airline Transport Pilot Licence
BITD	Basic Instrument Training Device
CBT	Computer Based Training
CFI	Chief Flight Instructor
CPL	Commercial Pilot Licence
DCA	Department of Civil Aviation
EASA	European Aviation Safety Agency
FCL	Flight Crew Licence
FFS	Full Flight Simulator
FMS	Flight Management System
FSTD	Flight Simulation Training Device
FTD	Flight Training Device
HT	Head of Training
ICAO	International Civil Aviation Organisation
LAPL	Light Aircraft Pilot Licence
LIFUS	Line Flying Under Supervision
LO	Learning Objectives
MCAR	Mauritius Civil Aviation Requirements
MEL	Minimum Equipment List
MPL	Multi-crew Pilot Licence
OPC	Operator Proficiency Check
PF	Pilot Flying
PPL	Private Pilot Licence
QTG	Qualification Test Guide
SMM	Safety Management Manual
TCH	Type Certificate Holder
TEM	Threat and Error Management
UPRT	Upset Prevention and Recovery Training
VAR	Volcanic Activity Report
ZFTT	Zero Flight Time Training

**MCAR Part-ORA**

MCAR Part-ORA is aligned with the following EU Regulations:

- Regulation (EU) No 290/2012
- Regulation (EU) No 70/2014
- Regulation (EU) No 2015/445
- Regulation (EU) No 2016/539
- Regulation (EU) No 2018/1119
- Regulation (EU) No 2020/359

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**SUBPART GEN – GENERAL REQUIREMENTS**

**SECTION I – GENERAL**

**MCAR.ORA.GEN.105 Authority**

- (a) For the purpose of this Part, the Department of Civil Aviation (DCA) exercising oversight over:
- (1) organisations subject to a certification obligation shall be:
    - (i) for organisations having their principal place of business in a Member State, the authority designated by that Member State;
    - (ii) for organisations having their principal place of business located in a third country, the EASA/ICAO;
  - (2) Flight Simulation Training Devices (FSTDs) shall be:
    - (i) the EASA/ICAO, for FSTDs:
      - located outside the territory of the Member States, or,
      - located within the territory of the Member States and operated by organisations having their principal place of business located in a third country,
    - (ii) for FSTDs located within the territory of the Member States and operated by organisations having their principal place of business in a Member State, the authority designated by the Member State where the organisation operating it has its principle place of business, or the EASA/ICAO, if so requested by the Member State concerned.
- (b) When the FSTD located outside the territory of the Member States is operated by an organisation certified by a Member State, the EASA/ICAO shall qualify this FSTD in coordination with the Member State that has certified the organisation that operates such FSTD.

**MCAR.ORA.GEN.115 Application for an organisation certificate**

- (a) The application for an organisation certificate or an amendment to an existing certificate shall be made in a form and manner established by the DCA, taking into account the applicable requirements of Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements.

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- (b) Applicants for an initial certificate shall provide the DCA with documentation demonstrating how they will comply with the requirements established in Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements. Such documentation shall include a procedure describing how changes not requiring prior approval will be managed and notified to the DCA.

#### **MCAR.ORA.GEN.120 Means of compliance**

- (a) Alternative means of compliance to the AMC adopted by the EASA/ICAO may be used by an organisation to establish compliance with Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements.
- (b) When an organisation wishes to use an alternative means of compliance, it shall, prior to implementing it, provide the DCA with a full description of the alternative means of compliance. The description shall include any revisions to manuals or procedures that may be relevant, as well as an assessment demonstrating that Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements are met.

The organisation may implement these alternative means of compliance subject to prior approval by the DCA and upon receipt of the notification as prescribed in MCAR.ARA.GEN.120(d).

#### **AMC1 MCAR.ORA.GEN.120(a) Means of compliance**

##### **DEMONSTRATION OF COMPLIANCE**

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

#### **MCAR.ORA.GEN.125 Terms of approval and privileges of an organisation**

A certified organisation shall comply with the scope and privileges defined in the terms of approval attached to the organisation's certificate.

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#### AMC1 MCAR.ORA.GEN.125 Terms of approval and privileges of an organisation

##### MANAGEMENT SYSTEM DOCUMENTATION

The management system documentation should contain the privileges and detailed scope of activities for which the organisation 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.

#### MCAR.ORA.GEN.130 Changes to organisations

(a) Any change affecting:

- (1) the scope of the certificate or the terms of approval of an organisation; or
- (2) any of the elements of the organisation's management system as required in [MCAR.ORA.GEN.200\(a\)\(1\) and \(a\)\(2\)](#), shall require prior approval by the DCA.

(b) For any changes requiring prior approval in accordance with Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements, the organisation shall apply for and obtain an approval issued by the DCA. The application shall be submitted before any such change takes place, in order to enable the DCA to determine continued compliance with Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements and to amend, if necessary, the organisation certificate and related terms of approval attached to it.

The organisation shall provide the DCA with any relevant documentation.

The change shall only be implemented upon receipt of formal approval by the DCA in accordance with MCAR.ARA.GEN.330.

The organisation shall operate under the conditions prescribed by the DCA during such changes, as applicable.

(c) All changes not requiring prior approval shall be managed and notified to the DCA as defined in the procedure approved by the DCA in accordance with MCAR.ARA.GEN.310(c).



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#### AMC1 MCAR.ORA.GEN.130 Changes to organisations

##### APPLICATION TIME FRAMES

- (a) The application for the amendment of an organisation 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 organisation should inform the DCA 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 DCA to determine continued compliance with the applicable requirements and to amend, if necessary, the organisation certificate and related terms of approval.

#### GM1 MCAR.ORA.GEN.130(a) Changes to organisations

##### GENERAL

- (a) Typical examples of changes requiring prior approval which may affect the certificate or the terms of approval are listed below:
  - (1) the name of the organisation;
  - (2) the organisation's principal place of business;
  - (3) the organisation's scope of activities;
  - (4) additional locations of the organisation;
  - (5) the accountable manager;
  - (6) any of the persons referred to in [MCAR.ORA.GEN.210\(a\) and \(b\)](#);
  - (7) the organisation's documentation as required by this Part, safety policy and procedures;
  - (8) the facilities.
- (b) Prior approval by the DCA is required for any changes to the organisation's procedure describing how changes not requiring prior approval will be managed and notified to the DCA.
- (c) Changes requiring prior approval may only be implemented upon receipt of formal approval by the DCA.

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#### GM2 MCAR.ORA.GEN.130(a) Changes to organisations

##### CHANGE OF NAME OF THE ORGANISATION

A change of name requires the organisation 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 DCA under the previous name, as a means of demonstrating how the organisation complies with the applicable requirements.

#### GM1 MCAR.ORA.GEN.130(c) Changes to organisations

##### GENERAL

Typical examples of changes not requiring prior approval are to the following items:

- (a) medical equipment (e.g. electrocardiograph (ECG), ophthalmoscope);
- (b) flight simulation training device (FSTD) operator's technical personnel;
- (c) change in schedule of preventive maintenance; and
- (d) list of instructors.

It is recommended that all information on changes not requiring prior approval be included as annexes to the approved training organisation (ATO)'s, FSTD operator's, as well as aeromedical centre's documentation

#### MCAR.ORA.GEN.135 Continued validity

(a) The organisation's certificate shall remain valid subject to:

- (1) the organisation remaining in compliance with the relevant requirements of Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements, taking into account the provisions related to the handling of findings as specified under [MCAR.ORA.GEN.150](#);

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- (2) the DCA being granted access to the organisation as defined in [MCAR.ORA.GEN.140](#) to determine continued compliance with the relevant requirements of Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements; and
  - (3) the certificate not being surrendered or revoked.
- (b) Upon revocation or surrender the certificate shall be returned to the DCA without delay.

#### MCAR.ORA.GEN.140 Access

For the purpose of determining compliance with the relevant requirements of the Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements, the organisation shall grant access to any facility, aircraft, document, records, data, procedures or any other material relevant to its activity subject to certification, whether it is contracted or not, to any person authorised by:

- (a) the DCA defined in [MCAR.ORA.GEN.105](#); or
- (b) the authority acting under the provisions of MCAR.ARA.GEN.300(d), MCAR.ARA.GEN.300(e) or ARO.RAMP.

#### MCAR.ORA.GEN.150 Findings

After receipt of notification of findings, the organisation shall:

- (a) identify the root cause of the non-compliance;
- (b) define a corrective action plan; and
- (c) demonstrate corrective action implementation to the satisfaction of the DCA within a period agreed with that authority as defined in MCAR.ARA.GEN.350(d).

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#### AMC1 MCAR.ORA.GEN.150(b) Findings

##### GENERAL

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

#### GM1 MCAR.ORA.GEN.150 Findings

##### GENERAL

- (a) 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.
- (b) Proper determination of the root cause is crucial for defining effective corrective actions.

#### MCAR.ORA.GEN.155 Immediate reaction to a safety problem

The organisation shall implement:

- (a) any safety measures mandated by the DCA in accordance with MCAR.ARA.GEN.135(c); and
- (b) any relevant mandatory safety information issued by the EASA/ICAO, including airworthiness directives.

#### MCAR.ORA.GEN.160 Occurrence reporting

- (a) The organisation shall report to the DCA, and to any other organisation required by the State of the operator to be informed, any accident, serious incident and occurrence as defined in the Civil Aviation Regulations 2007 as amended.
- (b) Without prejudice to paragraph (a) the organisation shall report to the DCA and to the organisation responsible for the design of the aircraft any incident, malfunction, technical defect, exceeding of technical limitations and any occurrence that would highlight inaccurate, incomplete or ambiguous information contained in the operational suitability data established in accordance with the Civil Aviation

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Regulations 2007 as amended or other irregular circumstance that has or may have endangered the safe operation of the aircraft and that has not resulted in an accident or serious incident.

- (c) Without prejudice to the Civil Aviation Regulation 2007 as amended, the reports referred in paragraphs (a) and (b) shall be made in a form and manner established by the DCA and contain all pertinent information about the condition known to the organisation.
- (d) Reports shall be made as soon as practicable, but in any case within 72 hours of the organisation identifying the condition to which the report relates, unless exceptional circumstances prevent this.
- (e) Where relevant, the organisation shall produce a follow-up report to provide details of actions it intends to take to prevent similar occurrences in the future, as soon as these actions have been identified. This report shall be produced in a form and manner established by the DCA.

#### AMC1 MCAR.ORA.GEN.160 Occurrence reporting

##### GENERAL

In addition to occurrence reporting in accordance with Civil Aviation Regulations, the organisation should report all occurrences defined in AMC 20-8.

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### SECTION II - MANAGEMENT

#### MCAR.ORA.GEN.200 Management system

- (a) The organisation shall establish, implement and maintain a management system that includes:
- (1) clearly defined lines of responsibility and accountability throughout the organisation, including a direct safety accountability of the accountable manager;
  - (2) a description of the overall philosophies and principles of the organization with regard to safety, referred to as the safety policy;
  - (3) the identification of aviation safety hazards entailed by the activities of the organisation, their evaluation and the management of associated risks, including taking actions to mitigate the risk and verify their effectiveness;
  - (4) maintaining personnel trained and competent to perform their tasks;
  - (5) documentation of all management system key processes, including a process for making personnel aware of their responsibilities and the procedure for amending this documentation;
  - (6) a function to monitor compliance of the organisation with the relevant requirements. Compliance monitoring shall include a feedback system of findings to the accountable manager to ensure effective implementation of corrective actions as necessary; and
  - (7) any additional requirements that are prescribed in the relevant subparts of this Part or other applicable Parts.
- (b) The management system shall correspond to the size of the organisation and the nature and complexity of its activities, taking into account the hazards and associated risks inherent in these activities.
- (c) Notwithstanding point (a), in an organisation providing training only for the LAPL, PPL, SPL or BPL and the associated ratings or certificates, safety risk management and compliance monitoring defined in points (a)(3) and (a)(6) may be accomplished by an organisational review, to be performed at least once every calendar year. The DCA shall be notified about the results of this review by the organisation without undue delay.

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#### AMC1 MCAR.ORA.GEN.200(a)(1) ;(2) ;(3) ;(5) Management system

##### **NON-COMPLEX ORGANISATIONS - 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 organisation.
- (b) The organisation 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 organisation's existing hazard identification, risk assessment and mitigation processes.
- (c) The organisation 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 in the organisation.
- (d) Within the organisation, 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 organisation 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 organisation or specified individuals in an emergency and reflect the size, nature and complexity of the activities performed by the organisation.

#### AMC1 MCAR.ORA.GEN.200(a)(1) Management system

##### **COMPLEX ORGANISATIONS - ORGANISATION AND ACCOUNTABILITIES**

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

- (a) Safety manager

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(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 organisation'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.



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#### GM1 MCAR.ORA.GEN.200(a)(1) Management system

##### **SAFETY MANAGER**

- (a) Depending on the size of the organisation and the nature and complexity of its activities, the safety manager may be assisted by additional safety personnel for the performance of all safety management related tasks.
- (b) Regardless of the organisational set-up it is important that the safety manager remains the unique focal point as regards the development, administration and maintenance of the organisation's safety management system.

#### GM2 MCAR.ORA.GEN.200(a)(1) Management system

##### **COMPLEX ORGANISATIONS - 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 MCAR.ORA.GEN.200(a)(2) Management system

##### **COMPLEX ORGANISATIONS - SAFETY POLICY**

- (a) The safety policy should:
  - (1) be endorsed by the accountable manager;

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- (2) reflect organisational commitments regarding safety and its proactive and systematic management;
- (3) be communicated, with visible endorsement, throughout the organisation; 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 MCAR.ORA.GEN.200(a)(2) Management system

##### **SAFETY POLICY**

The safety policy is the means whereby the organisation 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 MCAR.ORA.GEN.200(a)(3) Management system

##### **COMPLEX ORGANISATIONS - 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 organisation.

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- (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 DCA.

#### (d) Safety performance monitoring and measurement

- (1) Safety performance monitoring and measurement should be the process by which the safety performance of the organisation is verified in comparison to the safety policy and objectives.
- (2) This process should include:
  - (i) safety reporting;
  - (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 organisation'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

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The organisation 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 organisation's existing hazard identification, risk assessment and mitigation processes.

(f) Continuous improvement

The organisation 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 organisation or specified individuals in an emergency. The ERP should reflect the size, nature and complexity of the activities performed by the organisation.
- (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 MCAR.ORA.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 organisation 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

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- (2) ensure that knowledge of relevant incidents and accidents is disseminated, so that other persons and organisations 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.

#### GM3 MCAR.ORA.GEN.200(a)(3) Management system

### APPROVED TRAINING ORGANISATIONS - RISK MANAGEMENT OF FLIGHT OPERATIONS WITH KNOWN OR FORECAST VOLCANIC ASH CONTAMINATION

#### (a) Responsibilities

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

The ATO 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 ATO takes into account 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 ATO should make use of the safety risk assessment within its management system as required by [MCAR.ORA.GEN.200](#).

The ATO'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

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nature and severity of these effects and the related pre-flight, in-flight and post-flight precautions to be observed by the ATO.

The ATO 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 ATO 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 and any other relevant 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 maintenance or continuing airworthiness interventions.

The ATO should retain sufficient qualified and competent staff to generate well supported operational risk management decisions and ensure that its staff are appropriately trained and current. It is recommended that the ATO 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 the ATO's potential response

Before and during operations, information valuable to the ATO is generated by various volcano agencies worldwide. The ATO'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 ATO's response may consist of the following:

##### (1) Pre-eruption

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The ATO 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 ATO whose areas of activity include 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 ATO 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 ATO 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 ATO's procedures should include a requirement for crews to initiate re-routes to avoid the affected airspace.

The ATO 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 ATO:

- (i) determine if any aircraft in flight could be affected, alert the crew and provide advice on re-routing 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 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 ATO 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 ATO 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 ATO 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 ATO 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 ATO should ensure that the situation is monitored closely and operations adjusted to suit changing conditions.

The ATO should be aware that, depending on the State concerned the affected or danger areas may be established and presented in a different way than the one currently used in Europe as described in EUR Doc 019-NAT Doc 006.

The ATO 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 DCA's ATO.

For the purpose of flight planning, the ATO 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 over-flown as it would mountainous terrain, modified in accordance with its safety risk assessment. The ATO should take account of the risk of cabin depressurisation or engine failure resulting in the inability to maintain level flight above a volcanic cloud. Additional minimum Equipment List (MEL) provisions, if applicable, should be considered in consultation with the TCHs.

Flying below a volcanic ash contaminated airspace should be considered on a case by case basis. It should only be planned to reach or leave an



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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 ATO 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 ATO'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

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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 ATO'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 ATO's management.

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

When conducting a volcanic ash safety risk assessment, the ATO 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 ATO including any necessary amendments to aircraft operating manuals, aircraft maintenance manuals, master minimum equipment list/dispatch deviation or equivalents required to support the ATO; and
- (v) the recommended inspections associated with inadvertent operations in volcanic ash 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) ATO/contracted organisations' personnel

Definition of procedures for flight planning and operations ensuring that:

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

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- (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 and 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 other relevant information for crews; and
- (iii) communication of the latest information to crews 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 a volcanic ash encounter.

(8) Minimum equipment list

Additional provisions in the MEL, if applicable, 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;

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- (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 continuing airworthiness records or aircraft log if available 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 continuing airworthiness records or aircraft log if available 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 [MCAR.ORA.GEN.160](#).

#### (12) Continuing airworthiness procedures

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

- (i) enhancement of vigilance during inspections and regular maintenance and appropriate adjustments to maintenance practices;
- (ii) definition of a follow-up procedure when a volcanic ash cloud encounter has been reported or suspected;
- (iii) thorough investigation for any sign of unusual or accelerated abrasions or corrosion or of volcanic ash accumulation;
- (iv) reporting to TCHs and the relevant authorities observations and experiences from operations in areas of volcanic ash cloud contamination;
- (v) completion of any additional maintenance recommended by the TCH or by the DCA.

(f) Reporting

The ATO 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, an aircraft technical log entry for:

- (1) any incident related to volcanic clouds;
- (2) any observation of volcanic ash activity and
- (3) anytime that volcanic ash is not encountered in an area where it was forecast to be.

(g) Additional guidance

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).

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GM4 MCAR.ORA.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 ATO 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		

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#### AMC1 MCAR.ORA.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 organisation 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 MCAR.ORA.GEN.200(a)(4) Management system

##### TRAINING AND COMMUNICATION ON SAFETY

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

#### AMC1 MCAR.ORA.GEN.200(a)(5) Management system

##### ORGANISATION'S MANAGEMENT SYSTEM DOCUMENTATION

- (a) The organisation's management system documentation should at least include the following information:
    - (1) a statement signed by the accountable manager to confirm that the organisation will continuously work in accordance with the applicable requirements and the organisation's documentation as required by this Part;
    - (2) the organisation's scope of activities;
    - (3) the titles and names of persons referred to in [MCAR.ORA.GEN.210\(a\) and \(b\)](#);
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- (4) an organisation chart showing the lines of responsibility between the persons referred to in [MCAR.ORA.GEN.210](#);
  - (5) a general description and location of the facilities referred to in [MCAR.ORA.GEN.215](#);
  - (6) procedures specifying how the organisation ensures compliance with the applicable requirements;
  - (7) the amendment procedure for the organisation's management system documentation.
- (b) The organisation'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.

#### GM1 MCAR.ORA.GEN.200(a)(5) Management system

#### ORGANISATION'S MANAGEMENT SYSTEM DOCUMENTATION

- (a) It is not required to duplicate information in several manuals. The information may be contained in any of the organisation manuals (e.g. operations manual, training manual), which may also be combined.
- (b) The organisation 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 organisation's management system documentation.

#### AMC2 MCAR.ORA.GEN.200(a)(5) Management system

#### COMPLEX ORGANISATIONS – ORGANISATION'S 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 organisation. 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;
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- (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 organisation.

#### AMC1 MCAR.ORA.GEN.200(a)(6) Management system

### COMPLIANCE MONITORING - GENERAL

#### (1) Compliance monitoring

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

- (1) The organisation 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 organisation and the complexity of the activities to be monitored.

(2) 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:

- (1) privileges of the organisation;
  - (2) manuals, logs, and records;
  - (3) training standards;
  - (4) management system procedures and manuals.
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#### (3) Organisational set up

- (1) To ensure that the organisation 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 organisation are monitored for compliance with the applicable regulatory requirements, and any additional requirements as established by the organisation, and that these activities are being 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 [MCAR.ORA.GEN.210\(b\)](#);
  - (iii) be able to demonstrate relevant knowledge, background and appropriate experience related to the activities of the organisation; including knowledge and experience in compliance monitoring; and
  - (iv) have access to all parts of the organisation, and as necessary, any contracted organisation.
- (4) In the case of a non-complex organisation, 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 organisation 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.

#### (4) Compliance monitoring documentation

- (1) Relevant documentation should include the relevant part(s) of the organisation's management system documentation.
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(2) In addition, relevant documentation should also include the following:

- (i) terminology;
- (ii) specified activity standards;
- (iii) a description of the organisation;
- (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.

#### (5) Training

- (1) Correct and thorough training is essential to optimise compliance in every organisation. In order to achieve significant outcomes of such training, the organisation should ensure that all personnel understand the objectives as laid down in the organisation'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 MCAR.ORA.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 organisation 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 [MCAR.ORA.GEN.200\(a\)\(6\)](#) point (c)(3)(iii), either from within or outside the organisation.

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- (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 within the organisation.
- (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 organisation 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 organisation 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 MCAR.ORA.GEN.200(a)(6) Management system

### COMPLEX ORGANISATIONS - COMPLIANCE MONITORING PROGRAMME FOR ATOs

- (a) Typical subject areas for compliance monitoring audits and inspections for approved training organisations (ATOs) should be the following:
  - (1) facilities;
  - (2) actual flight and ground training;
  - (3) technical standards.
- (b) ATOs should monitor compliance with the training and operations manuals they have designed to ensure safe and efficient training. In doing so, they should, where appropriate, additionally monitor the following:
  - (1) training procedures;
  - (2) flight safety;
  - (3) flight and duty time limitations, rest requirements and scheduling;
  - (4) aircraft maintenance/operations interface.

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#### GM3 MCAR.ORA.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 MCAR.ORA.GEN.200(b) Management system

##### SIZE, NATURE AND COMPLEXITY OF THE ACTIVITY

- (a) An organisation should be considered as complex when it has a workforce of more than 20 full time equivalents (FTEs) involved in the activity.
  - (b) Organisations with up to 20 full time equivalents (FTEs) involved in the activity, 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) different types of aircraft used;
      - (iii) the environment (offshore, mountainous area etc.);
  - (c) Regardless of the criteria mentioned in (a) and (b), the following organisations should always be considered as non-complex:
    - (1) Approved Training Organisations (ATOs) only providing training for the light aircraft pilot licence (LAPL), private pilot licence (PPL), sailplane pilot licence (SPL) or balloon pilot licence (BPL) and the associated ratings and certificates;
    - (2) Aero-Medical Centres (AeMCs).
  - (d) Regardless of the criteria mentioned in (a) and (b), the organisations that provide training in the following areas should always be considered as complex:
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- (1) full flight simulators (FFSs); or
- (2) multi-pilot (MP) type rating; or
- (3) zero-flight-time training (ZFTT); or
- (4) complex aircraft; or
- (5) different categories of aircraft; or
- (6) instructor certificates for point (2) and (4) aircraft; or
- (7) two or more aerodromes/operating sites.

#### AMC1 MCAR.ORA.GEN.200(c) Management system

#### **ATOs PROVIDING TRAINING ONLY FOR THE LAPL, PPL, SPL AND BPL AND THE ASSOCIATED RATINGS OR CERTIFICATES – ORGANISATIONAL REVIEW**

- (a) The primary objective of the organisational review is to enable the organisation to ensure that its management system remains effective by verifying that it:
  - (1) has continually identified its aviation safety hazards;
  - (2) has effectively mitigated the associated risks; and
  - (3) monitors compliance with the applicable requirements.
- (b) Safety risk management should:
  - (1) be performed using internal safety or occurrence reports, hazard checklists, risk registers or similar risk management tools or processes, integrated into the activities of the organisation;
  - (2) in particular address safety risks related to a change; making use of the existing hazard identification, risk assessment and mitigation tools or processes; and
  - (3) include provisions for emergency response or a formal Emergency Response Plan (ERP).
- (c) As part of the management system documentation required by [MCAR.ORA.GEN.200\(a\)\(5\)](#), the organisation should describe the organisational review programme and related responsibilities. Persons responsible for the organisational review should have a thorough knowledge of the applicable requirements and of the organisation's procedures.
- (d) The status of all corrective and risk mitigation actions should be monitored by the person responsible for the organisational review programme and implemented within a specified time frame. Action closure should be recorded by the person responsible for the organisational review programme, along with a summary of the action taken.

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- (e) The results of the organisational review, including all non-compliance findings and new risks identified during the review, should be presented to the accountable manager and the person or group of persons nominated in accordance with [MCAR.ORA.GEN.210\(b\)](#) prior to notification to the DCA. All level 1 findings in the sense of MCAR.ARA.GEN.350 should be immediately notified to the DCA and all necessary actions immediately taken.
- (f) Based on the results of the organisational review, the accountable manager should determine the need for and initiate, as appropriate, further actions to address deficiencies in or further improve the organisation's management system.

#### GM1 MCAR.ORA.GEN.200(c) Management system

#### **ATOs PROVIDING TRAINING ONLY FOR THE LAPL, PPL, SPL OR BPL AND THE ASSOCIATED RATINGS OR CERTIFICATES – ORGANISATIONAL REVIEW PROGRAMME**

- (a) The organisational review programme may consist of:
  - (1) checklist(s) covering all items necessary to be addressed in order to ensure that the organisation identified its aviation safety hazards, effectively mitigates the associated risks and ensures effective compliance with the applicable requirements. These should address all procedures described in the management system documentation and training manual; and
  - (2) a schedule for the accomplishment of the different checklist items, with each item being checked at least once within any 12-month period. The organisation may choose to conduct one full review annually or to conduct several partial reviews.
- (b) Performance of organisational reviews:

Each review item may be addressed using an appropriate combination of:

  - (1) review of training records, training documentation;
  - (2) review of internal safety reports (e.g. notified difficulties in using current procedures and training material, etc.);
  - (3) review of the risk register and hazard checklists, as applicable;
  - (4) sample check of training courses;
  - (5) witnessing of examinations, as appropriate;
  - (6) interview of the personnel involved; and
  - (7) review of the feedback provided by students and customers.



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- (c) It is recommended that internal safety reports and occurrence reports be reviewed on a continual basis with the aim of identifying possible corrective and risk mitigation actions.

#### GM2 MCAR.ORA.GEN.200(c) Management system

#### **ATOs PROVIDING TRAINING ONLY FOR THE LAPL, PPL, SPL OR BPL AND THE ASSOCIATED RATINGS OR CERTIFICATES – ORGANISATIONAL REVIEW ITEMS**

The following provides a list of typical items for an organisational review checklist, to be adapted as necessary to cover all relevant procedures described in the management system documentation and training manual:

(a) Terms of approval

Check that:

- (1) no training has been performed outside the terms of approval;
- (2) changes not requiring prior approval have been properly managed.

(b) Training syllabi and course material

Check that:

- (1) training syllabi and course materials are in compliance with the applicable requirements, as last amended;
- (2) training practices are in compliance with the documentation; and
- (3) instructor training practices are standardised.

(c) Training equipment and tools

Check that all equipment and tools other than aircraft and FSTDs are present and meet the criteria defined in the training manual.

(d) Facilities

Check that the facilities meet the criteria defined in the training manual.

(e) Training aircraft and FSTDs

Check that the training aircraft and FSTDs meet the criteria defined in the training manual.

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#### (f) Personnel

Check that:

- (1) the current accountable manager and other nominated persons are correctly identified;
- (2) the organisation chart accurately indicates lines of responsibility and accountability throughout the organisation;
- (3) the organisation remains in compliance with the applicable requirements, in case the number of personnel has decreased or if the activity has increased;
- (4) the qualification of all new personnel (or personnel with new functions) has been appropriately assessed;
- (5) staff involved in any safety management-related processes and tasks has been properly trained; and
- (6) staff has been trained, as necessary, to cover changes in regulations, in DCA publications, in the organisation, its management system documentation and in associated procedures, etc.

#### (g) Contracted activities (In case the organisation has contracted activities):

- (1) Check that new providers have been assessed prior to the establishment of any contract;
- (2) For existing providers approved for such activities: check the authorisation and approval status of the contracted organisation; and
- (3) For existing providers not approved for such activities: check that the service provided conforms to the applicable requirements of this Part.

#### (h) Training and communication on safety

Check that:

- (1) all personnel are aware of safety management policies, processes and tasks;
- (2) safety-related documentations and publications are available; and
- (3) safety-critical information derived from internal safety or occurrence reporting and hazard identification have been timely communicated to all staff concerned.

#### (i) Management system documentation

Check that:

- (1) the documentation is adequate and updated;

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- (2) staff are aware of the safety policy; and
- (3) staff can easily access such documentation when needed.

(j) Record-keeping

Check that:

- (1) the records cover all the training activities and management system processes; and
- (2) minimum record-keeping periods (random checks) are complied with.

(k) Emergency response provisions or ERP

Check that:

- (1) emergency response information is up to date and readily available; and
- (2) all staff are aware of emergency response information or the ERP, as applicable (random checks).

(l) Internal safety or occurrence reporting procedures

- (1) Check the number of reports received since the last review;
- (2) Check that:
  - (i) internal reporting and external occurrence reporting are performed in accordance with reporting procedures;
  - (ii) the safety or occurrence reports are analysed; and
  - (iii) feedback is provided to reporters.

(m) Other risk management tools or processes implemented

- (1) As applicable, check that:
  - (i) records of hazards and risks are assessed; in particular following analysis of safety or occurrence reports and when significant changes occur (regulations, personnel, training aircraft, training courses, etc.);
  - (ii) the risks are assessed and the risk mitigation actions followed up and recorded;
  - (iii) any risk that has been found acceptable is duly justified; and
  - (iv) the assumptions made for the risk assessment remain valid;
- (2) Verify the effectiveness of all risk mitigation actions initiated since the last organisational review.

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#### MCAR.ORA.GEN.205 Contracted activities

- (a) Contracted activities include all activities within the organisation's scope of approval that are performed by another organisation either itself certified to carry out such activity or if not certified, working under the contracting organisation's approval. The organisation shall ensure that when contracting or purchasing any part of its activity, the contracted or purchased service or product conforms to the applicable requirements.
- (b) When the certified organisation contracts any part of its activity to an organisation that is not itself certified in accordance with this Part to carry out such activity, the contracted organisation shall work under the approval of the contracting organisation. The contracting organisation shall ensure that the DCA is given access to the contracted organisation, to determine continued compliance with the applicable requirements.

#### AMC1 MCAR.ORA.GEN.205 Contracted activities

##### RESPONSIBILITY WHEN CONTRACTING ACTIVITIES

- (a) The organisation may decide to contract certain activities to external organisations.
- (b) A written agreement should exist between the organisation 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 organisation's safety management and compliance monitoring programmes.
- (d) The organisation 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 MCAR.ORA.GEN.205 Contracted activities

##### RESPONSIBILITY WHEN CONTRACTING ACTIVITIES

- (a) Regardless of the approval status of the contracted organisation, the contracting organisation is responsible to ensure that all contracted activities are subject to hazard identification and risk management as required by

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[MCAR.ORA.GEN.200\(a\)\(3\)](#) and to compliance monitoring as required by [MCAR.ORA.GEN.200\(a\)\(6\)](#).

- (b) When the contracted organisation is itself certified to carry out the contracted activities, the organisation's compliance monitoring should at least check that the approval effectively covers the contracted activities and that it is still valid.
- (c) If the organisation requires the contracted organisation to conduct an activity which exceeds the contracted organisation's terms of approval, this will be considered as the contracted organisation working under the approval of the contracting organisation.

#### **MCAR.ORA.GEN.210 Personnel requirements**

- (a) The organisation shall appoint an accountable manager, who has the authority for ensuring that all activities can be financed and carried out in accordance with the applicable requirements. The accountable manager shall be responsible for establishing and maintaining an effective management system.
- (b) A person or group of persons shall be nominated by the organisation, with the responsibility of ensuring that the organisation remains in compliance with the applicable requirements. Such person(s) shall be ultimately responsible to the accountable manager.
- (c) The organisation shall have sufficient qualified personnel for the planned tasks and activities to be performed in accordance with the applicable requirements.
- (d) The organisation shall maintain appropriate experience, qualification and training records to show compliance with paragraph (c).
- (e) The organisation shall ensure that all personnel are aware of the rules and procedures relevant to the exercise of their duties.

#### **MCAR.ORA.GEN.215 Facility requirements**

The organisation shall have facilities allowing the performance and management of all planned tasks and activities in accordance with the applicable requirements.

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**AMC1 MCAR.ORA.GEN.215 Facility requirements**

**ATOs PROVIDING TRAINING FOR the CPL, MPL AND ATPL AND THE ASSOCIATED RATINGS AND CERTIFICATES**

(a) For ATOs providing flight training, the following flight operations accommodation should be available:

(1) an operations room with facilities to control flying operations;

(2) a flight planning room with the following facilities:

- (i) appropriate current maps and charts;
- (ii) current aeronautical information service (AIS) information ;
- (iii) current meteorological information;
- (iv) communications to air traffic control (ATC) and the operations room;
- (v) any other flight safety related material.

(3) adequate briefing rooms/cubicles of sufficient size and number;

(4) suitable offices for the supervisory personnel and room(s) to allow flight instructors to write reports on students, complete records and other related documentation;

(5) furnished crew-room(s) for instructors and students.

(b) For ATOs providing theoretical knowledge training, the following facilities for theoretical knowledge instruction should be available:

(1) adequate classroom accommodation for the current student population;

(2) suitable demonstration equipment to support the theoretical knowledge instruction;

(3) a radiotelephony training and testing facility;

(4) a reference library containing publications giving coverage of the syllabus;

(5) offices for the instructional personnel.

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**AMC2 MCAR.ORA.GEN.215 Facility requirements**

**ATOs PROVIDING TRAINING FOR THE LAPL, PPL, SPL OR BPL AND THE ASSOCIATED RATINGS AND CERTIFICATES**

- (a) The following flight operations accommodation should be available:
- (1) a flight planning room with the following facilities:
    - (i) appropriate current aviation maps and charts;
    - (ii) current AIS information;
    - (iii) current meteorological information;
    - (iv) communications to ATC (if applicable);
    - (v) any other flight safety related material.
  - (2) adequate briefing room(s)/cubicles of sufficient size and number;
  - (3) suitable office(s) to allow flight instructors to write reports on students, complete records and other related documentation;
  - (4) suitable rest areas for instructors and students, where appropriate to the training task;
  - (5) in the case of ATOs providing training for the BPL or LAPL(B) only, the flight operations accommodation listed in (a)(1) to (a)(4) may be replaced by other suitable facilities when operating outside aerodromes.
- (b) The following facilities for theoretical knowledge instruction should be available:
- (1) adequate classroom accommodation for the current student population;
  - (2) suitable demonstration equipment to support the theoretical knowledge instruction;
  - (3) suitable office(s) for the instructional personnel.
- (c) A single room may be sufficient to provide the functions listed in (a) and (b).

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#### MCAR.ORA.GEN.220 Record-keeping

- (a) The organisation shall establish a system of record-keeping that allows adequate storage and reliable traceability of all activities developed, covering in particular all the elements indicated in [MCAR.ORA.GEN.200](#).
- (b) The format of the records shall be specified in the organisation's procedures.
- (c) Records shall be stored in a manner that ensures protection from damage, alteration and theft.

#### AMC1 MCAR.ORA.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.



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#### GM1 MCAR.ORA.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 ATO – APPROVED TRAINING ORGANISATIONS**

### **SECTION I – GENERAL**

#### **MCAR.ORA.ATO.100 Scope**

This Subpart establishes the requirements to be met by organisations providing training for pilot licences and associated ratings and certificates.

#### **GM1 MCAR.ORA.ATO.100 Scope**

The content of this Section contains the requirements applicable to all ATOs providing training for pilot licences and the associated ratings and certificates.

It is applicable to ATOs providing training for:

- (a) the LAPL, PPL, SPL and BPL and the associated ratings and certificates; and
- (b) the commercial pilot licence (CPL), multi-crew pilot licence (MPL) and airline transport pilot licence (ATPL) and the associated ratings and certificates.

#### **MCAR.ORA.ATO.105 Application**

- (a) Applicants for the issue of a certificate as an approved training organisation (ATO) shall provide the DCA with:

(1) the following information:

- (i) name and address of the training organisation;
- (ii) date of intended commencement of activity;
- (iii) personal details and qualifications of the head of training (HT), the flight instructor(s), flight simulation training instructors and the theoretical knowledge instructor(s);
- (iv) name(s) and address(es) of the aerodromes(s) and/or operating site(s) at which the training is to be conducted;

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- (v) list of aircraft to be operated for training, including their group, class or type, registration, owners and category of the certificate of airworthiness, if applicable
  - (vi) list of flight simulation training devices (FSTDs) that the training organisation intends to use, if applicable;
  - (vii) the type of training that the training organisation wishes to provide and the corresponding training programme; and
- (2) the operations and training manuals.

(b) Flight test training organisations. Notwithstanding (a)(1)(iv) and (v), training organisations providing flight test training shall only need to provide:

- (1) the name(s) and address(es) of the main aerodromes and/or operating site(s) at which the training is to be conducted; and
- (2) a list of the types or categories of aircraft to be used for flight test training.

(c) In the case of a change to the certificate, applicants shall provide the DCA with the relevant parts of the information and documentation referred to in (a).

**AMC1 MCAR.ORA.ATO.105 Application**

**APPLICATION FORM**

<b>APPLICATION FORM FOR AN ATO CERTIFICATE</b>		
<b>N°</b>	<b>Question</b>	<b>Supplementary information</b>
1.	Name of training organisation under which the activity is to take place	address, fax number, e-mail, URL
2.	Training courses offered	theory and/or flight training
3.	Name of head of training	type and number of licence full/part-time
4.	Name of chief flight instructor	as (3)
5.	Name of chief theoretical knowledge instructor	as (3)
6.	Name of flight instructor(s), where applicable	as (3)

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7.	Aerodrome(s) / operating site(s) to be used	IFR approaches, if applicable night flying, if applicable air traffic control flight testing facilities, if applicable data reply facilities, if applicable
8.	Flight operations accommodation	location, number and size of rooms
9.	Theoretical instruction facilities	location, number and size of rooms
10.	Description of training devices (as applicable)	FFS, FNPT I, II and III, FTD 1, 2 and 3, and 3, and BITD
11.	Description of aircraft	Class/type(s) of aircraft registration of aircraft IFR equipped, if applicable Flight test instrumentation, if applicable
12.	Proposed administration and manuals: (submit with application if required )	(a) course programmes (b) training records (c) operations manual (d) training manual
13.	Details of proposed compliance monitoring system	

Note 1: If answers to any of the above questions are incomplete, the applicant should provide full details of alternative arrangements separately.

Note 2: instrument flight rules (IFR), full flight simulator (FFS), flight and navigation procedures trainer (FNPT), flight training device (FTD), basic instrument training device (BITD)

I, (name), on behalf of (name of training organisation) certify that all the above named persons are in compliance with the applicable requirements and that all the above information given is complete and correct. (Date) (Signature)

**MCAR.ORA.ATO.110 Personnel requirements**

(a) An HT shall be nominated. The HT shall have extensive experience as an instructor in the areas relevant for the training provided by the ATO and shall possess sound managerial capability.

(b) The HT's responsibilities shall include:

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- (1) ensuring that the training provided is in compliance with MCAR Part-FCL, and, in the case of flight test training, that the relevant requirements of MCAR Part-21 and the training programme have been established;
  - (2) ensuring the satisfactory integration of flight training in an aircraft or a flight simulation training device (FSTD) and theoretical knowledge instruction; and
  - (3) supervising the progress of individual students.
- (c) Theoretical knowledge instructors shall have:
- (1) practical background in aviation in the areas relevant for the training provided and have undergone a course of training in instructional techniques; or
  - (2) previous experience in giving theoretical knowledge instruction and an appropriate theoretical background in the subject on which they will provide theoretical knowledge instruction.
- (d) Flight instructors and flight simulation training instructors shall hold the qualifications required by MCAR Part-FCL for the type of training they provide.

#### **AMC1 MCAR.ORA.ATO.110(b) Personnel requirements**

### **HEAD OF TRAINING**

The nominated head of training (HT) should have the overall responsibility to ensure that the training is in compliance with the appropriate requirements. In an ATO providing training courses for different aircraft categories, the HT shall be assisted by one or more nominated deputy HT(s) for certain flight training courses.

#### **AMC1 MCAR.ORA.ATO.110(c) Personnel requirements**

### **THEORETICAL KNOWLEDGE INSTRUCTORS**

Theoretical knowledge instructors should, before appointment, prove their competency by giving a test lecture based on material they have developed for the subjects they are to teach.

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#### GM1 MCAR.ORA.ATO.110(d) Personnel requirements

- (a) Before allowing an FI that is experienced as specified in point FCL.905.FI(h)(3) to supervise SPIC flights during an IR training course, the ATO should consider at least the following factors:
- (1) the experience of the FI;
  - (2) the experience of the student pilot;
  - (3) the nature and complexity of the SPIC flight to be performed;
  - (4) the complexity and characteristics of the training aircraft; and
  - (5) the prevailing weather conditions. (b) The ATO should identify the hazards related to the SPIC supervision and apply appropriate mitigation measures to reduce the associated risks.

#### MCAR.ORA.ATO.120 Record-keeping

The following records shall be kept throughout the course and for a period of three years after the completion of the training:

- (a) details of ground, flight, and simulated flight training given to individual students;
- (b) detailed and regular progress reports from instructors including assessments, and regular progress flight tests and ground examinations; and
- (c) information on the licences and associated ratings and certificates of the students, including the expiry dates of medical certificates and ratings.

#### AMC1 MCAR.ORA.ATO.120(a);(b) Record-keeping

#### **ATOs PROVIDING TRAINING ONLY FOR THE LAPL, PPL, SPL OR BPL AND THE ASSOCIATED RATINGS AND CERTIFICATES**

The details of ground, flight and flight instruction by using FSTD given to a specific individual student and the detailed progress reports from instructors may be kept also in a student's progress card. This progress card should contain all the exercises of the training syllabus. The instructor should sign this card if a certain exercise has been completed or a specific assessment has been conducted.

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#### **MCAR.ORA.ATO.125 Training programme**

- (a) A training programme shall be developed for each type of course offered.
- (b) The training programme shall comply with the requirements of MCAR Part-FCL and, in the case of flight test training, the relevant requirements of MCAR Part 21.

#### **AMC1 MCAR.ORA.ATO.125 Training programme**

##### **GENERAL**

Flight training in an FSTD and theoretical knowledge instruction should be phased in such a manner as to ensure that students are able to apply to flight exercises the knowledge gained on the ground. Arrangements should be made so that problems encountered during instruction can be resolved during subsequent training.

#### **AMC2 MCAR.ORA.ATO.125 Training programme**

##### **TYPE RATING COURSES – AEROPLANES**

###### **(a) Introduction**

- (1) When developing the training programme for a type rating course, in addition to complying with the standards included in the operational suitability data (OSD), as established in accordance with MCAR Part-FCL for the applicable type, the ATO should also follow any further recommendations contained therein.
- (2) The type rating course should, as far as possible, provide for a continual process of ground, FSTD and flight training to enable the student to assimilate the knowledge and skills required to operate a specific aircraft type safely and efficiently. The student's ability to do this should be determined by the demonstration of a satisfactory level of theoretical knowledge of the aircraft determined by progressive checking of knowledge and examination, progressive assessment by the ATO during flight training and the successful completion of a practical skill test with an examiner.
- (3) The type rating course should normally be conducted as a single, fulltime course of study and training. However, in the situation where the course is intended to enable a pilot to fly a further aircraft type while continuing to fly a current type, such as to enable mixed fleet flying with the same operator, some

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elements of the theoretical knowledge course conducted by self-study may be undertaken while the student continues to fly the current type.

#### (b) Variants

- (1) Familiarisation: Where an aeroplane type rating also includes variants of the same aircraft type requiring familiarisation, the additional familiarisation elements may be included in the theoretical knowledge training of the initial type rating course.
- (2) Differences training: Where an aeroplane type rating also includes variants of the same aircraft type for which difference training is required, the initial training course should be directed towards a single variant. Additional training to operate other variants within the same type rating should be completed after successful completion of the initial type rating course. However, elements of this differences training may be undertaken at appropriate stages of the initial course, with the agreement of the DCA.

#### (c) Programme of theoretical knowledge and flight training

- (1) The training programme should specify the time allocated to theoretical knowledge training, FSTD training and, if not approved for zero flight time training (ZFTT), the aeroplane. The initial type rating course should be programmed on the basis that the student has the minimum licensing and experience requirements for entry to the course. For a first type rating on a multi-pilot aeroplane (MPA), the course should also provide for consolidation and type-specific training in those elements of basic multi-crew cooperation (MCC) training relevant to the type or variant.
- (2) If the ATO wishes to provide a training course that includes credit for previous experience on similar types of aircraft, such as those with common systems or operating procedures with the new type, the entry requirements to such courses should be specified by the ATO and should define the minimum level of experience and qualification required of the flight crew member.
- (3) The ATO is permitted to contract elements of training to a third party training provider. In such cases the contracted organisation should normally be approved to conduct such training. When the contracted organisation is not an ATO, the DCA should, within the approval process of the ATO, include the contracted organisation and be satisfied that the standard of training intended to be given meets the requirements. The other obligations of the ATO, such as student progress monitoring and an adequate management system, can be



exercised by the ATO seeking approval and which retains responsibility for the whole course.

## **GROUND TRAINING**

### **(d) Syllabus**

The ground training syllabus should provide for the student to gain a thorough understanding of the operation, function and, if appropriate, abnormal and emergency operation of all aircraft systems. This training should also include those systems essential to the operation of the aircraft, such as 'fly-by-wire' flight control systems, even if the flight crew have little or no control of their normal or abnormal operation.

### **(e) Theoretical knowledge instruction**

The theoretical knowledge instruction training should meet the general objectives of (but not be limited to) giving the student:

- (1) a thorough knowledge of the aircraft structure, powerplant and systems, and their associated limitations, including mass and balance, aircraft performance and flight planning considerations;
- (2) a knowledge of the positioning and operation of the cockpit controls and indicators for the aircraft and its systems;
- (3) an understanding of system malfunctions, their effect on aircraft operations and interaction with other systems; and
- (4) the understanding of normal, abnormal and emergency procedures.

### **(f) Facilities and training aids**

The ATO should provide adequate facilities for classroom instruction and have available appropriately qualified and experienced instructors. Training aids should enable students to gain practical experience of the operation of systems covered by the theoretical knowledge syllabus and, in the case of multi-pilot aeroplanes, enable such practical application of the knowledge to be carried out in a multi-crew environment. Facilities should be made available for student self-study outside the formal training programme.

### **(g) Computer-based training (CBT)**

CBT provides a valuable source of theoretical instruction, enabling the students to progress at their own pace within specified time limits. Many such systems ensure that syllabus subjects are fully covered and progress can be denied until a satisfactory assimilation of knowledge has been demonstrated. Such systems may

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allow self-study or distance learning, if they incorporate adequate knowledge testing procedures. When CBT is used as part of the theoretical knowledge instruction phase, the student should also have access to a suitably qualified instructor able to assist with areas of difficulty for the student.

#### (h) Self-study and distance learning

Elements of the theoretical knowledge syllabus may be adequately addressed by distance learning, if approved, or self-study, particularly when utilising CBT. Progress testing, either by self-assessed or instructor-evaluated means should be included in any self-study programme. If self-study or distance learning is included in the theoretical knowledge training, the course should also provide for an adequate period of supervised consolidation and knowledge testing.

#### (i) Progress tests and final theoretical knowledge examination

(1) The theoretical knowledge training programme should provide for progressive testing of the assimilation of the required knowledge. This testing process should also provide for retesting of syllabus items so that a thorough understanding of the required knowledge is assured. This should be achieved by intervention by a qualified instructor or, if using CBT with a self-testing facility, and by further testing during the supervised consolidation phase of the ground course.

(2) The final theoretical knowledge examination should cover all areas of the theoretical knowledge syllabus. The final examination should be conducted as a supervised written (including computer-based) knowledge test without reference to course material. The pass mark of 75% assumes the achievement of satisfactory levels of knowledge during the progressive phase tests of the course. The student should be advised of any areas of lack of knowledge displayed during the examination and, if necessary, given remedial instruction. A successful pass of the theoretical knowledge course and final examination should be a pre-requisite for progression to the flight training phase of the type rating course, unless otherwise determined in the OSD established in accordance with MCAR Part-FCL.

## FLIGHT TRAINING

#### (j) Flight simulation training devices (FSTDs)

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

The amount of training required when using FSTDs will depend on the complexity of the aeroplane concerned, and to some extent on the previous experience of the

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pilot. Except for those courses giving credit for previous experience (c.2.), a minimum of 32 hours of FSTD training should be programmed for a crew of a multi-pilot aeroplane, of which at least 16 hours should be in an FFS operating as a crew. FFS time may be reduced if other qualified FSTDs used during the flight training programme accurately replicate the cockpit environment, operation and aeroplane response. Such FSTDs may typically include flight management computer (FMC) training devices using hardware and computer programmes identical to those of the aeroplane.

(k) Aeroplane training with FFS

(1) with the exception of courses approved for ZFTT, certain training exercises normally involving take-off and landing in various configurations should be completed in the aeroplane rather than in an FFS. Unless otherwise specified in the OSD established in accordance with MCAR Part-FCL this take-off and landing training should include:

(A) at least four landings in the case of MPAs (or single-pilot high performance complex aeroplanes (SP HPAs)) where the student pilot has more than 500 hours of MPA experience (or SPA experience) in aeroplanes of similar size and performance or, in all other cases, at least six landings;

(B) at least one full-stop landing; and

(C) one go-around with all engines operating.

This aeroplane training may be completed after the student pilot has completed the FSTD training and has successfully undertaken the type rating skill test, provided it does not exceed 2 hours of the flight training course.

(2) courses approved for ZFTT

(i) During the specific simulator session before line flying under supervision (LIFUS), consideration should be given to varying conditions, for example:

(A) runway surface conditions;

(B) runway length;

(C) flap setting;

(D) power setting;

(E) crosswind and turbulence conditions; and

(F) maximum take-off mass (MTOM) and maximum landing mass (MLM).

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- (ii) At least one landing should be conducted as full-stop landing. The session should be flown in normal operation. Special attention should be given to the taxiing technique.
  - (iii) A training methodology should be agreed with the DCA that ensures the trainee is fully competent with the exterior inspection of the aeroplane before conducting such an inspection un-supervised.
  - (iv) The LIFUS should be performed as soon as possible after the specific FFS session.
  - (v) The licence endorsement should be entered on the licence after the skill test, but before the first four take-offs and landings in the aeroplane. At the discretion of the DCA, provisional or temporary endorsement and any restriction should be entered on the licence.
  - (vi) Where a specific arrangement exists between the ATO and the commercial air transport operator, the operator proficiency check (OPC) and the ZFTT specific details should be conducted using the operator's standard operating procedures (SOPs).
- (3) All training exercises should be designed to remain within the training envelope as determined by the ATO (Note: Further guidance regarding the training envelope can be found in [GM1 MCAR.ORA.ATO.125](#) point (f)).
- (l) Aeroplane without FFS
- (1) Flight training conducted solely in an aeroplane without the use of FSTDs cannot cover the crew resource management (CRM) and multicrew cockpit (MCC) aspects of MPA flight training, and for safety reasons cannot cover all emergency and abnormal aircraft operation required for the training and skill test. In such cases, the ATO should demonstrate to the DCA that adequate training in these aspects can be achieved by other means. For training conducted solely on an MPA where two pilots are trained together without the use of an FSTD, a minimum of 8 hours of flight training as pilot flying (PF) for each pilot should normally be required. For training on a single-pilot aeroplane, 10 hours of flight training should normally be required. It is accepted that for some relatively simple single or multi-engine aircraft without systems such as pressurisation, flight management system (FMS) or electronic cockpit displays, this minimum may be reduced.
  - (2) Aeroplane training normally involves an inherent delay in achieving an acceptable flight situation and configuration for training to be carried out in
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accordance with the agreed syllabus. These could include ATC or other traffic delay on the ground prior to take-off, the necessity to climb to height or transit to suitable training areas and the unavoidable need to physically reposition the aircraft for subsequent or repeat manoeuvres or instrument approaches. In such cases it should be ensured that the training syllabus provides adequate flexibility to enable the minimum amount of required flight training to be carried out.

(la) Additional UPRT training as per point FCL. 725.A(c) UPRT as per point FCL. 725.A(c) should include the elements and components in table 1.

**Table 1: Elements and respective components of upset prevention training**

Elements and components		TK instruction	FSTD/Aeroplane training
<b>A.</b>	<b>Aerodynamics</b>		
1.	General aerodynamic characteristics	•	
2.	Aeroplane certification and limitations	•	
3.	Aerodynamics (high and low altitudes)	•	•
4.	Aeroplane performance (high and low altitudes)	•	•
5.	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>B.</b>	<b>Causes of and contributing factors to upsets</b>		
1.	Environmental	•	
2.	Pilot-induced	•	
3.	Mechanical (aeroplane systems)	•	
<b>C.</b>	<b>Safety review of accidents and incidents relating to aeroplane upsets</b>		
1.	Safety review of accidents and incidents relating to aeroplane upsets	•	
<b>D.</b>	<b>G-load awareness and management</b>		
1.	Positive/negative/increasing/decreasing G-loads	•	•
2.	Lateral G awareness (sideslip)	•	•

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Elements and components		TK instruction	FSTD/Aeroplane training
3.	G-load management	•	•
<b>E.</b>	<b>Energy management</b>		
1.	Kinetic energy vs potential energy vs effect of thrust-drag ratio on the total energy	•	•
<b>F.</b>	<b>Flight path management</b>		
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	•	•
<b>G.</b>	<b>Recognition</b>		
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	•	•
<b>H.</b>	<b>System malfunction</b> (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 (see also point (Ib) of this AMC)	•	•
5.	Automation failures	•	•
6.	Fly-by-wire (FBW) protection degradations	•	•
7.	Stall protection system failures including icing alerting systems	•	•

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- (lb) Flight path management (manual or automatic, as appropriate) during unreliable airspeed indication and other failures at high altitude in aeroplanes with a maximum cruising altitude above FL300.

The following training elements should be integrated into type rating training courses for aeroplanes with a maximum cruising altitude above FL300:

Element	TK instruction	FSTD / Aeroplane training
Basic flight physics principles concerning flight at high altitude, with a particular emphasis on the relative proximity of the critical Mach number and the stall, pitch behaviour, and an understanding of the reduced stall angle of attack when compared with low altitude flight.	•	•
Interaction of the automation (autopilot, flight director, auto-throttle/auto-thrust) and the consequences of failures inducing disconnection of the automation.	•	•
Consequences of an unreliable airspeed and other failures indication at high altitude and the need for the flight crew to promptly identify the failure and react with appropriate (minimal) control inputs to keep the aircraft in a safe envelope.	•	•
Degradation of FBW flight control laws/modes and its consequence on aircraft stability and flight envelope protections, including stall warnings.	•	•
Practical training, using appropriate simulators, on manual handling at high altitude in normal and in non-normal flight control laws/modes, with particular emphasis on pre-stall buffet, the reduced stall angle of attack when compared with low altitude flight, and the effect of pitch inputs on the aircraft trajectory and energy state.		•
The requirement to promptly and accurately apply the stall recovery procedure, as provided by the aircraft manufacturer, at the first indication of an impending stall. Differences between high-altitude and low-altitude stalls must be addressed.	•	•

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Procedures for taking over and transferring manual control of the aircraft, especially for FBW aeroplanes with independent side-sticks.	•	•
Task sharing and crew coordination in high workload/stress conditions with appropriate call-out and acknowledgement to confirm changes to the aircraft flight control law/mode.	•	•

#### SKILL TEST

(m) Upon completion of the flight training, the pilot will be required to undergo a skill test with an examiner to demonstrate adequate competency of aircraft operation for issue of the type rating. The skill test should be separate from the flight training syllabus, and provision for it cannot be included in the minimum requirements or training hours of the agreed flight training programme. The skill test may be conducted in an FFS, the aeroplane or, in exceptional circumstances, a combination of both.

#### COURSE COMPLETION CERTIFICATE

(n) The HT, or a nominated representative, should certify that all training has been carried out before an applicant undertakes a skill test for the type rating to be included in the pilot's licence. If an ATO is unable to provide certain elements of the training that is required to be carried out on an aircraft the ATO may issue such a certificate confirming the completion of the ground training or the training in an FSTD.

#### AMC3 MCAR.ORA.ATO.125 Training programme

#### TYPE RATING COURSES – HELICOPTERS

##### (a) Introduction

- (1) when developing the training programme for a type rating course, in addition to complying with the standards included in the OSD as established in accordance with MCAR Part-FCL for the applicable type, the ATO should also follow any further recommendations contained therein.
- (2) the course should, as far as possible, provide for integrated ground, FSTD and flight training designated to enable the student to operate safely and qualify for the grant of a type rating. The course should be directed towards a helicopter type, but where variants exist, all flying and ground training forming the basis of the course should relate to a single variant.



**(b) Variants**

- (1) Familiarisation training: where a helicopter type rating also includes variants of the same aircraft type requiring familiarisation training, the additional familiarisation training may be included in the theoretical knowledge training of the initial type rating course.
- (2) Differences training: where a helicopter type rating also includes variants of the same aircraft type for which difference training is required, the initial training course should be directed towards a single variant. Additional training to operate other variants within the same type rating should be completed after successful completion of the initial type rating course, although elements of this differences training may be undertaken at appropriate stages of the initial course, with the agreement of the DCA.

**(c) Training in helicopter and FSTDs**

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

**(d) Skill test**

The content of the flight training programme should be directed towards the skill test for that type. The practical training given in MCAR Part-FCL should be modified as necessary.

The skill test may be completed in a helicopter, in an FFS or partially in a helicopter and in an FSTD. The use of an FSTD for skill tests is governed by the level of approval of the flight simulator and the previous experience of the candidate. Where an FSTD is not available, abnormal operations of systems should not be practised in a helicopter other than as allowed for in the skill test form for the type.

**(e) Phase progress tests and final theoretical knowledge examination**

Prior to the final theoretical knowledge examination covering the whole syllabus, the training programme should provide for phase progress tests associated with each phase of theoretical knowledge instruction. The phase progress tests should assess the candidate's knowledge on completion of each phase of the training programme.

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#### (f) Facilities: ground school equipment, training facilities and aids

The ATO should provide, as a minimum, facilities for classroom instruction. Additional classroom training aids and equipment including, where appropriate, computers, should reflect the content of the course and the complexity of the helicopter. For multi-engine and multi-pilot helicopters, the minimum level of ground training aids should include equipment that provides a realistic cockpit working environment. Task analysis and the latest state-of-the-art training technology is encouraged and should be fully incorporated into the training facilities wherever possible. Facilities for self and supervised testing should be available to the student.

#### (g) Training devices

An FTD or OTD may be provided to supplement classroom training in order to enable students to practice and consolidate theoretical instruction. Where suitable equipment is not available, or is not appropriate, a helicopter or flight simulator of the relevant variant should be available.

If an FTD represents a different variant of the same helicopter type for which the student is being trained, then differences or familiarisation training is required.

#### (h) Computer-based training (CBT)

Where CBT aids are used as a training tool, the ATO should ensure that a fully qualified ground instructor is available at all times when such equipment is being used by course students. Other than for revision periods, CBT lessons should be briefed and debriefed by a qualified ground instructor.

#### (i) Theoretical knowledge instruction

The theoretical knowledge instruction training should meet the general objectives of giving the student:

- (1) a thorough knowledge of the helicopter structure, transmissions, rotors and equipment, powerplant and systems, and their associated limitations;
- (2) a knowledge of the positioning and operation of the cockpit controls and indicators for the helicopter and its systems;
- (3) a knowledge of performance, flight planning and monitoring, mass and balance, servicing and optional equipment items;

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- (4) an understanding of system malfunctions, their effect on helicopter operations and interaction with other systems; and
- (5) the understanding of normal, abnormal and emergency procedures and giving the student the understanding of potential control problems near the edge of the handling envelope. In particular, the phenomenon of 'servo transparency' (also known as 'jack stall') should be covered for those helicopter types where it is a known problem.

The amount of time and the contents of the theoretical instruction will depend on the complexity of the helicopter type involved and, to some extent, on the previous experience of the student.

#### (j) Flight training

##### (1) FSTDs

The level of qualification and the complexity of the type will determine the amount of practical training that may be accomplished in an FSTD, including completion of the skill test. Prior to undertaking the skill test, a student should demonstrate competency in the skill test items during the practical training.

##### (2) Helicopter (with FSTD)

With the exception of courses approved for ZFTT, the amount of flight time in a helicopter should be adequate for completion of the skill test.

##### (3) Helicopters (without FSTD)

Whenever a helicopter is used for training, the amount of flight time practical training should be adequate for the completion of the skill test. The amount of flight training will depend on the complexity of the helicopter type involved and, to some extent, on the previous experience of the applicant.

## AMC4 MCAR.ORA.ATO.125 Training programme

### FLIGHT TEST TRAINING COURSES – AEROPLANES AND HELICOPTERS

#### (a) Introduction

- (1) The flight test training course should, as far as possible, provide for a continuous process of ground and flight training to enable the student to assimilate the knowledge and skills required to conduct flight testing safely and efficiently. The student's ability to do this should be determined by the demonstration of a satisfactory level of theoretical knowledge of flight testing determined by progressive checking of knowledge and examination and

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progressive assessment by the ATO during flying training. There should be no difference in the level of knowledge or competency required of the student, irrespective of the intended role of the student as test pilot or other flight test personnel (for example, flight test engineer) within the flight crew.

(2) The flight test training course should normally be conducted as a single, full-time course of study and training.

(b) Programme of theoretical knowledge and flight training

(1) The training programme should specify the time allocated to theoretical knowledge training and flying training.

(2) If the ATO wishes to provide a flight test training course that includes credit for previous experience on flight testing activity, the entry requirements to such courses should be specified by the ATO and should define the minimum level of experience and qualification required of the flight test crew member.

## **GROUND TRAINING**

(c) Syllabus

(1) The ground training syllabus should provide for the student to gain a thorough understanding of flight testing techniques.

(d) Theoretical knowledge instruction

(1) The theoretical knowledge instruction training should give the student a thorough knowledge of the academic requirements of flight testing.

(e) Facilities and training aids

(1) The ATO should provide adequate facilities for classroom instruction and have available appropriately qualified and experienced instructors. Training aids should enable students to gain practical experience of flight testing covered by the theoretical knowledge syllabus and enable such practical application of the knowledge to be carried out in a multicrew environment. Facilities should be made available for student self-study outside the formal training programme.

(f) Computer-based training (CBT)

(1) CBT provides a valuable source of theoretical instruction, enabling the student to progress at his/her own pace within specified time limits. Many such systems ensure that syllabus subjects are fully covered and progress can be denied until a satisfactory assimilation of knowledge has been demonstrated. Such systems

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may allow self-study or distance learning, if they incorporate adequate knowledge testing procedures. When CBT is used as part of the theoretical knowledge instruction phase, the student should also have access to a suitably qualified instructor able to assist with areas of difficulty for the student.

#### **(g) Self-study and distance learning**

- (1) Elements of the theoretical knowledge syllabus may be adequately addressed by distance learning, if approved, or self-study, particularly when utilising CBT. Progress testing, either by self-assessed or instructor-evaluated means, should be included in any self-study programme. If self-study or distance learning is included in the theoretical knowledge training, the course should also provide for an adequate period of supervised consolidation and knowledge testing prior to the commencement of flight training.

#### **(h) Progress tests and final theoretical knowledge examination**

- (1) The theoretical knowledge training programme should provide for progressive testing of the assimilation of the required knowledge. This testing process should also provide for retesting of syllabus items so that a thorough understanding of the required knowledge is assured. This should be achieved by intervention by a qualified instructor or, if using CBT with a self-testing facility, and by further testing during the supervised consolidation phase of the ground course.
- (2) The theoretical knowledge examinations should cover all areas of the theoretical knowledge syllabus. The examinations should be conducted as supervised written or oral knowledge tests without reference to course material. The pass mark (as defined by the ATO) assumes the achievement of satisfactory levels of knowledge during the progressive phase tests of the course. The student should be advised of any areas of lack of knowledge displayed during the examination and, if necessary, given remedial instruction.

## **FLIGHT TRAINING**

#### **(i) Aeroplane and helicopter training**

- (1) It is widely accepted that flying training normally involves inherent delay in achieving an acceptable flight situation and configuration for training to be carried out in accordance with the agreed syllabus. These could include ATC or other traffic delay on the ground prior to take off, the necessity to climb to height or transit to suitable training areas and the unavoidable need to physically reposition the aircraft for subsequent or repeat manoeuvres or instrument approaches. In such cases it should be ensured that the training

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syllabus provides adequate flexibility to enable the minimum amount of required flight training to be carried out.

#### FINAL IN-FLIGHT EXERCISE

- (j) Upon completion of the flight test training, the test pilot or flight test engineer will be required to undergo in-flight exercise with a flight test instructor (FTI) to demonstrate adequate competency of flight testing for issue of the flight test rating. The final in-flight exercise must be conducted in an appropriate aeroplane or helicopter (as applicable).

#### COURSE COMPLETION CERTIFICATE

- (k) The HT is required to certify that the applicant has successfully completed the training course.

### GM1 MCAR.ORA.ATO.125 Training programme

#### UPSET PREVENTION AND RECOVERY TRAINING (UPRT)

##### (a) General

The objective of the UPRT is to ensure that pilots are competent to prevent or recover from a developing or developed aeroplane upset. Prevention training prepares pilots to avoid upsets whereas recovery training prepares pilots to prevent an accident once an upset condition has developed.

##### (b) 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 as well as the importance of resilience development should be emphasised.

Training should also emphasise that an actual upset condition may expose pilots to significant physiological and psychological challenges, such as visual illusions, spatial disorientation and unusual G-forces, with the objective of developing strategies to deal with such challenges.

##### (c) Development of training scenarios

During the development of training scenarios, the ATO should ensure that all of the following is avoided:

- (a) negative training and negative transfer of training; and
- (b) training utilising predictive scenarios.

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Please refer to Revision 2 of the Airplane Upset Recovery Training Aid (AURTA) for further guidance on the development of training scenarios.

#### (d) Additional guidance

Specific guidance to the UPRT elements and exercises is available in:

- (1) the latest revision of the ICAO Doc 10011 'Manual on Aeroplane Upset Prevention and Recovery Training';
- (2) Revision 3 of the Airplane Upset Prevention and Recovery Training Aid (AUPRTA); and
- (3) the Flight Safety Foundation publication 'A Practical Guide for Improving Flight Path Monitoring', November 2014.

#### (e) Training platform

- (1) When designing a training course, ATOs should select aeroplanes that are suitable for all the required training exercises. Where certain exercises require particular capabilities, then an ATO may consider the use of different aeroplanes for different exercises. Examples include basic UPRT or instrument flight training and the advanced UPRT course.
- (2) For basic UPRT training conducted during the CPL or ATP courses, it is not anticipated that aerobatic category aeroplanes will be required or that aircraft need to be certificated for intentional spins. Aeroplanes with a maximum bank angle limitation may not be suitable for exercises such as steep turns or recovery from spiral dive.
- (3) For the advanced UPRT course (FCL.745), the use of an aeroplane certificated in the aerobatic category will provide the greatest safety margin. Aeroplanes certificated in the normal or utility category may also be suitable provided the exercises used during the training take into account the capabilities of the aeroplane and are planned to remain within the training envelope for the aeroplane, as determined by the ATO (see point (f)).

#### (f) Training envelope

The training envelope is the envelope within which all training exercises will be carried out. It should be specified by the ATO in terms of the range of attitudes, speed and g-loads that can be used for training, taking into account:

- (1) the training environment;
- (2) the capabilities of the instructors; and



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- (3) in the case of training in FSTDs, the limitations of the FSTD (as per GM3 FCL.010 for the FSTD training envelope); and
- (4) in the case of training in aeroplanes, the capabilities and certification of the aircraft, while considering a margin of safety in order to ensure that unintentional deviations from the training envelope will not exceed aircraft limitations. Different training envelopes may be specified for different aeroplane types even within a single training course.

#### **MCAR.ORA.ATO.130 Training manual and operations manual**

- (a) The ATO shall establish and maintain a training manual and operations manual containing information and instructions to enable personnel to perform their duties and to give guidance to students on how to comply with course requirements.
- (b) The ATO shall make available to staff and, where appropriate, to students the information contained in the training manual, the operations manual and the ATO's approval documentation.
- (c) In the case of ATOs providing flight test training, the operations manual shall comply with the requirements for the flight test operations manual, as established in MCAR Part-21.
- (d) The operations manual shall establish flight time limitation schemes for flight instructors, including the maximum flying hours, maximum flying duty hours and minimum rest time between instructional duties in accordance with MCAR Part-ORO.

#### **MCAR.ORA.ATO.135 Training aircraft and FSTDs**

- (a) The ATO shall use an adequate fleet of training aircraft or FSTDs appropriately equipped for the training courses provided. The fleet of aircraft shall be composed of aircraft that comply with all requirements defined in Civil Aviation Regulations 2007 as amended. Aircraft that fall under points (a), (b), (c) or (d) of MCAR Part-FCL, may be used for training if all of the following conditions are met:
  - (1) during an evaluation process the DCA has confirmed a level of safety comparable to the one defined by all essential requirements laid down in MCAR Part-FCL;
  - (2) the DCA has authorised the use of the aircraft for training in the ATO.
- (b) The ATO shall only provide training in FSTDs when it demonstrates to the DCA:



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- (1) the adequacy between the FSTD specifications and the related training programme;
  - (2) that the FSTDs used comply with the relevant requirements of MCAR Part-FCL;
  - (3) in the case of full flight simulators (FFSs), that the FFS adequately represents the relevant type of aircraft; and
  - (4) that it has put in place a system to adequately monitor changes to the FSTD and to ensure that those changes do not affect the adequacy of the training programme.
- (c) If the aircraft used for the skill test is of a different type to the FFS used for the visual flight training, the maximum credit shall be limited to that allocated for flight and navigation procedures trainer II (FNPT II) for aeroplanes and FNPT II/III for helicopters in the relevant flight training programme.
- (d) Flight test training organisations. Aircraft used for flight test training shall be appropriately equipped with flight testing instrumentation, according to the purpose of the training.

#### AMC1 MCAR.ORA.ATO.135 Training aircraft and FSTDs

##### **ALL ATOs, EXCEPT THOSE PROVIDING FLIGHT TEST TRAINING**

- (a) The number of training aircraft may be affected by the availability of FSTDs.
- (b) Each training aircraft should be:
- (1) equipped as required in the training specifications concerning the course in which it is used;
  - (2) except in the case of balloons or single-seat aircraft, fitted with primary flight controls that are instantly accessible by both the student and the instructor (for example dual flight controls or a centre control stick). Swing-over flight controls should not be used.
- (c) The fleet should include, as appropriate to the courses of training:
- (1) aircraft suitably equipped to simulate instrument meteorological conditions (IMC) and for the instrument flight training required. For flight training and testing for the instrument rating and the basic instrument rating (BIR) an adequate number of IFR-certificated aircraft should be available;
  - (2) in the case of aeroplanes and sailplanes, aircraft suitable for demonstrating stalling and spin avoidance;
  - (3) for the flight instructor (FI) training courses on aeroplanes and sailplanes, aircraft suitable for spin recovery at the developed stage;
  - (4) in the case of helicopters, helicopters suitable for autorotation demonstration;

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- (5) in the case of a non-complex ATO, one aircraft fulfilling all the required characteristics for a training aircraft might be sufficient;
- (6) each FSTD should be equipped as required in the training specifications concerning the course in which it is used.

#### AMC2 MCAR.ORA.ATO.135 Training aircraft and FSTDs

### EVALUATION PROCESS

Two cases for the evaluation process of MCAR Part-FCL aircraft are distinguished:

(a) MCAR Part-FCL aircraft that hold an ICAO-level certificate of airworthiness (CoA)

- (1) To support the evaluation process performed by the DCA and provide the DCA with sufficient data related to the aircraft in question, an instructor who is qualified in accordance with MCAR Part-FCL and nominated by the head of training (HT) of the ATO should assess that the aircraft is appropriately equipped and suitable for the training courses provided. The result of this assessment should be submitted to the DCA and may be included already in the application for the authorisation.
- (2) During the evaluation process, the DCA should consider aircraft that hold a CoA issued in accordance with Annex 8 to the Chicago Convention to provide a level of safety comparable to that required by MCAR Part 145, unless the DCA determines that the airworthiness requirements used for certification of the aircraft, or the service experience, or the safety system of the State of design, do not provide for a comparable level of safety.

(b) Annex-I aircraft that do not hold an ICAO-level CoA

Before the inclusion of these aircraft in the fleet of an ATO and their use in training to obtain Part-FCL licences and ratings, the ATO should apply for the authorisation to the DCA that should perform the evaluation process in the following order:

(1) Initial assessment by the DCA and criteria taken into consideration

The DCA should take into account the following criteria (non-exhaustive list):

- (i) national airworthiness requirements based on which the aircraft CoA was issued;
- (ii) aircraft similarities to a certified variant;
- (iii) aircraft with a satisfactory in-service experience as training aircraft;
- (iv) simple and conventional aircraft design;
- (v) aircraft that does not have hazardous design features or details, judging by experience; and

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(vi) operable aircraft systems, equipment, and appliances that do not require exceptional skills or strength.

(2) Additional assessment by a qualified instructor

To support the evaluation process performed by the DCA and provide the DCA with sufficient data related to the aircraft in question, after the positive initial assessment by the DCA as per point (1), an instructor who is qualified in accordance with Part-FCL and nominated by the HT of the ATO should show through an evaluation report that the aircraft is appropriately equipped and suitable for the training courses provided. That evaluation report should consider all of the following criteria:

- (i) the aircraft should be safely controllable and manoeuvrable under all anticipated operating conditions, including after failure of one or more propulsion systems;
- (ii) the aircraft should allow for a smooth transition from one flight phase to another without requiring exceptional piloting skills, alertness, strength, or workload under any probable operating conditions;
- (iii) the aircraft should have sufficient stability to ensure that the demands made on the pilot are not excessive, considering the phase and duration of flight; and
- (iv) the assessment should take into account control forces, flight deck environment, pilot workload, and other human factors (HF) considerations, depending on the phase and duration of flight.

Subject to a positive evaluation report as per point (2), the DCA should issue the authorisation.

#### **MCAR.ORA.ATO.140 Aerodromes and operating sites**

When providing flight training on an aircraft, the ATO shall use aerodromes or operating sites that have the appropriate facilities and characteristics to allow training of the manoeuvres relevant, taking into account the training provided and the category and type of aircraft used.

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#### AMC1 MCAR.ORA.ATO.140 Aerodromes and operating sites

##### GENERAL

- (a) Except in the case of balloons, the base aerodrome or operating site and any alternative base aerodromes at which flight training is being conducted should have at least the following facilities:
  - (1) at least one runway or final approach and take-off area (FATO) that allows training aircraft to make a normal take-off or landing within the performance limits of all the aircraft used for the training flights.
  - (2) a wind direction indicator that is visible at ground level from the ends of each runway or at the appropriate holding points;
  - (3) adequate runway electrical lighting if used for night training;
  - (4) an air traffic service, except for uncontrolled aerodromes or operating sites where the training requirements may be satisfied safely by another acceptable means of air-to-ground communication.
- (b) Except in the case of ATOs providing flight test training, in addition to (a), for helicopters, training sites should be available for:
  - (1) confined area operation training;
  - (2) simulated engine off autorotation; and
  - (3) sloping ground operation.
- (c) In the case of balloons, the take-off sites used by the ATO should allow a normal take-off and clearing of all obstacles in the take-off flight path by at least 50 ft.

#### MCAR.ORA.ATO.145 Pre-requisites for training

- (a) The ATO shall ensure that the students meet all the pre-requisites for training established in MCAR Part-Medical, MCAR Part-FCL.
- (b) In the case of ATOs providing flight test training, the students shall meet all the pre-requisites for training established in accordance with Civil Aviation Regulations 2007 as amended.

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#### AMC1 MCAR.ORA.ATO.145 Pre-requisites for training

##### ENTRANCE REQUIREMENTS

ATOs providing training for other than the LAPL, PPL, SPL or BPL and the associated ratings and certificates should establish entrance requirements for students in their procedures. The entrance requirements should ensure that the students have enough knowledge, particularly of physics and mathematics, to be able to follow the courses.

#### MCAR.ORA.ATO.150 Training in third countries

When the ATO is approved to provide training for the instrument rating (IR) in third countries:

- (a) the training programme shall include acclimatisation flying in one of the Member States before the IR skill test is taken; and
- (b) the IR skill test shall be taken in one of the Member States.

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#### SECTION II – ADDITIONAL REQUIREMENTS FOR ATOs PROVIDING TRAINING FOR CPL, MPL AND ATPL AND THE ASSOCIATED RATINGS AND CERTIFICATES

##### MCAR.ORA.ATO.210 Personnel requirements

- (a) Head of training (HT). Except in the case of ATOs providing flight test training, the nominated HT shall have extensive experience in training as an instructor for professional pilot licences and associated ratings or certificates.
- (b) Chief flight instructor (CFI). The ATO providing flight instruction shall nominate a CFI who shall be responsible for the supervision of flight and flight simulation training instructors and for the standardisation of all flight instruction and flight simulation instruction. The CFI shall hold the highest professional pilot licence and associated ratings related to the flight training courses conducted and hold an instructor certificate with the privilege to instruct for at least one of the training courses provided.
- (c) Chief theoretical knowledge instructor (CTKI). The ATO providing theoretical knowledge instruction shall nominate a CTKI who shall be responsible for the supervision of all theoretical knowledge instructors and for the standardisation of all theoretical knowledge instruction. The CTKI shall have extensive experience as a theoretical knowledge instructor in the areas relevant for the training provided by the ATO.

##### AMC1 MCAR.ORA.ATO.210 Personnel requirements

#### GENERAL

- (a) The management structure should ensure supervision of all grades of personnel by persons having the experience and qualities necessary to ensure the maintenance of high standards. Details of the management structure, indicating individual responsibilities, should be included in the ATOs operations manual.
- (b) The ATO should demonstrate to the DCA that an adequate number of qualified, competent staff is employed.
- (c) In the case of an ATO offering integrated courses, the head of training (HT), the chief flying instructor (CFI) and the chief theoretical-knowledge instructor (CTKI) should be employed full-time or part-time, depending upon the scope of training

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offered. The three positions of HT, CFI, and CTKI should not be combined but should be filled by three persons.

- (d) In all other case the positions of HT, CFI and CTKI may be combined and filled by one or two persons with extensive experience in the training conducted by the training organisation, full-time or part-time, depending upon the scope of training offered, provided that the organisation has demonstrated to the competent authority the adequacy of such personnel set-up for its organisation (point ORA.GEN.200(b)).
- (e) In the case of an ATO that provides flight training only, no CTKI function is required in the ATO. In the case of an ATO that provides theoretical-knowledge instruction only, no CFI function is required in the ATO.
- (f) The ratio of all students to all flight instructors, excluding the HT, should not exceed 6:1.
- (g) Classes in ground subjects that require maximal supervision or intensive practical work should not include more than 28 students.

#### **THEORETICAL KNOWLEDGE INSTRUCTORS**

- (h) The theoretical knowledge instruction for type or class ratings should be conducted by instructors holding the appropriate type or class rating, or having appropriate experience in aviation and knowledge of the aircraft concerned.
- (i) For this purpose, a flight engineer, a maintenance engineer or a flight operations officer should be considered as having appropriate experience in aviation and knowledge of the aircraft concerned.

#### **AMC2 MCAR.ORA.ATO.210 Personnel requirements**

#### **QUALIFICATION OF HEAD OF TRAINING AND CHIEF FLIGHT INSTRUCTOR**

##### **(a) Head of training (HT)**

The nominated HT should hold or have held in the 3 years prior to first appointment as HT, a professional pilot licence and associated ratings or certificates issued in accordance with MCAR Part-FCL, related to the flight training courses provided.

##### **(b) Chief flight instructor (CFI)**

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- (1) The CFI may delegate standardisation and supervision to the flight instructors. In all cases it is the CFI who is ultimately responsible for ensuring quality and standards.
- (2) The CFI should, except in the case of ATOs providing flight test training, have completed 1 000 hours of flight time as pilot-in-command (PIC).

At least 500 of those hours should be on flying instructional duties related to the flying courses provided, of which 200 hours may be instrument ground time.

#### MCAR.ORA.ATO.225 Training programme

- (a) The training programme shall include a breakdown of flight and theoretical knowledge instruction, presented in a week-by-week or phase layout, a list of standard exercises and a syllabus summary.
- (b) The content and sequence of the training programme shall be specified in the training manual.

#### MCAR.ORA.ATO.230 Training manual and operations manual

- (a) The training manual shall state the standards, objectives and training goals for each phase of training that the students are required to comply with and shall address the following subjects:
  - training plan,
  - briefing and air exercises,
  - flight training in an FSTD, if applicable,
  - theoretical knowledge instruction.
- (b) The operations manual shall provide relevant information to particular groups of personnel, as flight instructors, flight simulation training instructors, theoretical knowledge instructors, operations and maintenance personnel, and shall include general, technical, route and staff training information.



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#### AMC1 MCAR.ORA.ATO.230(a) Training manual and operations manual

#### TRAINING MANUAL

Training manuals for use at an ATO to conduct integrated or modular flight training courses should include the following:

(a) The training plan:

(1) The aim of the course (ATP, CPL/IR, CPL, etc. as applicable)	A statement of what the student is expected to do as a result of the training, the level of performance, and the training constraints to be observed.
(2) Pre-entry requirements	(i) Minimum age, educational requirements (including language), medical requirements; (ii) Any individual Member State requirements.
(3) Credits for previous experience	To be obtained from the DCA before training begins.
(4) Training syllabi	As applicable, the flying syllabus (single-engine or multiengine, as applicable), the flight simulation training syllabus and the theoretical knowledge training syllabus.
(5) The time scale and scale, in weeks, for each syllabus	Arrangements of the course and the integration of syllabi time.
(6) Training programme	(i) The general arrangements of daily and weekly programmes for flying, theoretical knowledge training and training in FSTDs, if applicable; (ii) Bad weather constraints; (iii) Programme constraints in terms of maximum student training times, (flying, theoretical knowledge, on FSTDs), for example per day, week or month; (iv) Restrictions in respect of duty periods for students; (v) Duration of dual and solo flights at various stages; (vi) Maximum flying hours in any day or night; (vii) Maximum number of training flights in any day or night; (viii) Minimum rest period between duty periods.
(7) Training records	(i) Rules for security of records and documents; (ii) Attendance records; (iii) The form of training records to be kept; (iv) Persons responsible for checking records and students' log books; (v) The nature and frequency of record checks; (vi) Standardisation of entries in training records; (vii) Rules concerning log book entries.
(8) Safety training	(i) Individual responsibilities;

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	<ul style="list-style-type: none"> <li>(ii) Essential exercises;</li> <li>(iii) Emergency drills (frequency);</li> <li>(iv) Dual checks (frequency at various stages);</li> <li>(v) Requirement before first solo day, night or navigation etc. if applicable.</li> </ul>
(9) Assessments, tests and examinations	<ul style="list-style-type: none"> <li>(i) Flying:               <ul style="list-style-type: none"> <li>(A) progress checks;</li> <li>(B) skill tests.</li> </ul> </li> <li>(ii) Theoretical knowledge:               <ul style="list-style-type: none"> <li>(A) progress tests;</li> <li>(B) theoretical knowledge examinations.</li> <li>(C) Area 100 KSA assessments.</li> </ul> </li> <li>(iii) Authorisation for test;</li> <li>(iv) Rules concerning refresher training before retest;</li> <li>(v) Test and assessment reports and records;</li> <li>(vi) Procedures for examination paper preparation, type of question and assessment, standard required for 'pass';</li> <li>(vii) Procedure for question analysis and review and for raising replacement papers;</li> <li>(viii) Examination resit procedures.</li> </ul>
(10) Training effectiveness	<ul style="list-style-type: none"> <li>(i) Individual responsibilities;</li> <li>(ii) General assessment;</li> <li>(iii) Liaison between departments;</li> <li>(iv) Identification of unsatisfactory progress (individual students);</li> <li>(v) Actions to correct unsatisfactory progress;</li> <li>(vi) Procedure for changing instructors;</li> <li>(vii) Maximum number of instructor changes per student;</li> <li>(viii) Internal feedback system for detecting training deficiencies;</li> <li>(ix) Procedure for suspending a student from training;</li> <li>(x) Discipline;</li> <li>(xi) Reporting and documentation.</li> </ul>
(11) Standards and level of performance at various stages	<ul style="list-style-type: none"> <li>(i) Individual responsibilities;</li> <li>(ii) Standardisation;</li> <li>(iii) Standardisation requirements and procedures;</li> <li>(iv) Application of test criteria.</li> </ul>

#### (b) Briefing and air exercises:

(1) Air exercise	A detailed statement of the content specification of all the air exercises to be taught, arranged in the sequence to be flown with main and subtitles.
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(2) Air exercise reference list	An abbreviated list of the above exercises giving only main and subtitles for quick reference, and preferably in flip-card form to facilitate daily use by instructors.
(3) Course structure: phase of training	A statement of how the course will be divided into phases, indication of how the above air exercises will be divided between the phases and how they will be arranged to ensure that they are completed in the most suitable learning sequence and that essential (emergency) exercises are repeated at the correct frequency. Also, the syllabus hours for each phase and for groups of exercises within each phase should be stated and when progress tests are to be conducted, etc.
(4) Course structure: integration of syllabi	The manner in which theoretical knowledge and flight training in an aircraft or an FSTD will be integrated so that as the flying training exercises are carried out students will be able to apply the knowledge gained from the associated theoretical knowledge instruction and flight training.
(5) Student progress	The requirement for student progress and include a brief but specific statement of what a student is expected to be able to do and the standard of proficiency he/she must achieve before progressing from one phase of air exercise training to the next. Include minimum experience requirements in terms of hours, satisfactory exercise completion, etc. as necessary before significant exercises, for example night flying.
(6) Instructional methods	The ATO requirements, particularly in respect of pre- and post-flying briefing, adherence to syllabi and training specifications, authorisation of solo flights, etc.
(7) Progress tests	The instructions given to examining staff in respect of the conduct and documentation of all progress tests.
(8) Glossary of terms	Definition of significant terms as necessary.
(9) Appendices	(i) Progress test report forms; (ii) Skill test report forms; (iii) ATO certificates of experience, competence, etc. as required.

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(c) Flight training in an FSTD, if applicable: Structure generally as for (b)

(d) Theoretical knowledge instruction:

(1) Structure of the theoretical knowledge course	A statement of the structure of the course, including the general sequence of the topics to be taught in each subject, the time allocated to each topic, the breakdown per subject and an example of a course schedule. Distance learning courses should include instructions of the material to be studied for individual elements of the course.
(2) Lesson plans	A description of each lesson or group of lessons including teaching materials, training aids, progress test organisation and inter-connection of topics with other subjects.
(3) Teaching materials	Specification of the training aids to be used (for example study materials, course manual references, exercises, self-study materials, demonstration equipment).
(4) Student progress	The requirement for student progress, including a brief but specific statement of the standard that must be achieved and the mechanism for achieving this, before application for theoretical knowledge examinations.
(5) Progress testing	The organisation of progress testing in each subject, including topics covered, evaluation methods and documentation.
(6) Review procedure	The procedure to be followed if the standard required at any stage of the course is not achieved, including an agreed action plan with remedial training if required.
(7) Appendices	(i) Examples of Area 100 KSA summative assessments; (ii) Area 100 KSA mental maths test example.

#### AMC2 MCAR.ORA.ATO.230(a) Training manual and operations manual

### THEORETICAL KNOWLEDGE COURSE DESIGN REQUIREMENTS

An ATO that delivers theoretical knowledge instruction for professional pilot licences should ensure that:

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- (a) the courses are designed and developed using the instructional systems design (ISD) methodology, which is supported by a robust and effective management system;
- (b) the courses include a standardised and dynamic assessment and testing system;
- (c) instructors that deliver KSA instruction have received appropriate training covering at least learning styles, teaching methods, facilitation techniques, threat and error management (TEM), the applicable competencies, and the content of the subject(s) and exercises that they are to deliver;
- (d) the recurrent training of instructors is conducted at least annually;
- (e) the instructors that are responsible for assessing Area 100 KSA have received appropriate training regarding the assessment(s) that they are to conduct, and are to be standardised to ensure that the assessment grades awarded are consistent across the ATO; this standardisation should include at least familiarisation with the performance indicators, the ATO's word pictures for grading, and the ATO's debriefing system; and
- (f) recurrent standardisation training is conducted at least annually to ensure continued inter-rater reliability.

#### **AMC3 MCAR.ORA.ATO.230(a) Training manual and operations manual**

### **AREA KSA 100 02 AND 100 03 LEARNING OBJECTIVES, ASSESSMENTS AND RECORDS**

- (a) An ATO that delivers theoretical knowledge instruction for professional pilot licences should ensure that for the learning objectives (LOs) in topics 100 02 and 100 03 of Area 100 KSA there are at least two summative assessments and at least one formative assessment. The summative assessments are to be documented in the student's training records. Both the summative assessments and the formative assessment(s) should be debriefed.
- (b) The formative assessment(s) should:
  - (1) be designed such that the student has the opportunity to ask questions and develop competencies in most of the LOs in 100 02 and 100 03 of Area 100 KSA;

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- (2) be conducted during the training; the ATO may in addition conduct a formative evaluation (continuous assessment) over a specified phase of the course; and
  - (3) be conducted by an instructor that is trained to deliver the formative assessment.
- (c) The summative assessments should:
- (1) be designed so that they collectively give the student the opportunity to demonstrate competency in all LOs in 100 02 and 100 03 of Area 100 KSA; each individual summative assessment may address some of the LOs in 100 02 and 100 03 of Area 100 KSA;
  - (2) be satisfactorily completed before the student is recommended by the ATO for their first attempt to take the final theoretical knowledge examination paper, and the outcome of the assessments should be included in the student's training record;
  - (3) require that for a student to be considered that they have achieved a 'Satisfactory' standard, they:
    - (i) meet at least 35 % (which defines the term 'some' used in the word pictures) of the indicators relevant to the assessment exercise, in each competency;
    - (ii) have an overall positive effect on the outcome or completion of the exercise without any external input from the instructor, or where the assessment requires the instructor to facilitate the exercise, without the instructor providing any knowledge or corrective input to assist in the completion of the exercise; and
  - (4) be conducted by an instructor that is trained to deliver the summative assessments.
- (d) The training manual should include the following elements regarding the theoretical knowledge training and assessment of the LOs in topics 100 02 and 100 03 of Area 100 KSA:
- (1) the positions, or range of positions, of the formative assessment exercise(s) and summative assessment exercises in the training programme;
  - (2) a description of the summative assessments, including a matrix that shows which Area 100 KSA LOs are covered in each exercise;
  - (3) the grading system of the Area 100 KSA summative assessment and a description of the ATO's minimum required standard;
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- (4) the template for the information about Area 100 KSA to be included in the student's training record, which should include at least the dates and result ('Pass' or 'Fail') of the summative assessments and the date and score of the mental maths test;
  - (5) the method of assessment debriefs for each summative and formative assessment;
  - (6) for a student who performs below the satisfactory standard in a summative assessment(s), the method to further develop the student's competencies and how to conduct the reassessment.
- (e) Access to the information on Area 100 KSA kept in the student's training records should be restricted to the student and authorised ATO personnel, and should not be disclosed outside the ATO. The information on the record should first be de-identified before it is used to support course design improvements.

#### **AMC4 MCAR.ORA.ATO.230(a) Training manual and operations manual**

#### **AREA 100 04 LEARNING OBJECTIVES: MENTAL MATHS TEST AND RECORDS**

- (a) An ATO that delivers theoretical knowledge instruction for professional pilot licences should ensure that at least one KSA mental maths test is conducted and the outcome(s) documented in the student's training records.
- (b) The mental maths test(s) may be written or oral in format and should, where possible, be scenario-based, with at least two questions per LO in topic 100 04 of Area 100 KSA.
- (c) The minimum score to pass the Area 100 KSA mental maths test(s) should be 75 % of the marks allocated to a test. However, a higher pass mark may be defined by the ATO.
- (d) The mental maths test(s) should be satisfactorily completed before the student is recommended by the ATO for their first attempt to take their final theoretical knowledge examination paper.

#### **GM1 MCAR.ORA.ATO.230(a) Training manual and operations manual**

#### **ASSESSMENT OF STUDENTS IN AREA 100 KSA**

- (a) The Area 100 KSA formative assessment(s) and summative assessments may include but not be limited to: written planning exercises combining multiple
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subjects; practical exercises using training devices (if available); scenario-based oral board (viva voce); scenario-based communications exercises; written assignments or project work; and preparation and delivery of group or individual presentations.

- (b) The format of formative and summative assessment debriefs should be effective, highlighting the student's strengths and weaknesses and enabling future improvement.

#### GM2 MCAR.ORA.ATO.230(a) Training manual and operations manual

### AREA 100 KSA WORD PICTURES

- (a) 'Word pictures' are a proven assessment tool that standardises pilot core competencies, and can be used to assess student's competency in the Area 100 KSA LOs in topics 100 02 and 100 03. Word pictures describe the student's performance. Each word picture is associated with a numerical grade; within the range of grades, the minimum acceptable standard is defined. Additionally, a word picture describing performance that falls below the minimum satisfactory standard should be included in the range, as well as additional word pictures that relate to grades which exceed this minimum satisfactory standard.

Word pictures enable the standardisation of the assessment performance and facilitate inter-rater reliability within an ATO.

- (b) This GM provides two examples of word pictures.
- (c) The most commonly used word pictures are shown in Section A below. They are based on performance indicators, which explain what the student should demonstrate in order to attain the specific Area 100 KSA LOs that are addressed by the assessment exercise. Word pictures are formed of elements that contain the following:
  - (1) HOW MANY of the performance indicators were observed and, where relevant, HOW OFTEN;
  - (2) HOW WELL the competency was demonstrated in the assessment exercise to have an overall positive effect on the outcome or completion of the assessment exercise;
  - (3) the level of success in the OUTCOME of the assessment exercise.
- (d) An ATO could establish its own set of word picture descriptions as long as they are comparable in the grading of each competency, similar to the 'Communication' and



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'Application of knowledge, UPRT and resilience' word pictures example in Section B below.

- (e) The advantage of word pictures is that they provide meaningful and standard data to enable identification of individual, crew, class, instructor and ATO trends, which can be analysed in order to provide feedback for further improvement or development.
- (f) An ATO should ensure that the detailed information obtained through its grading in Area 100 KSA is de-identified before using it to support course improvement.

### **SECTION A — EXAMPLE 1**

#### **AREA 100 KSA WORD PICTURE GRADE LEVELS (USING INDICATORS)**

- (g) The example shown below in this Section contains the most commonly used word pictures, which are formed of elements that contain the following:
  - (1) HOW MANY of the performance indicators in the table further below relevant to that summative assessment were observed in that competency (as a percentage);
  - (2) HOW WELL the competency was demonstrated in the assessment; and
  - (3) the level of success in the OUTCOME of the summative assessment.
- (h) In order to satisfactorily complete an Area KSA 100 summative assessment, the student should reach at least the minimum satisfactory level in each competency covered by that assessment. In case the student fails to reach the minimum satisfactory level in each competency, the student should repeat the summative assessment or another summative assessment that covers the competency(ies) where performance was previously assessed as unsatisfactory.

#### **GM3 MCAR.ORA.ATO.230(a) Training manual and operations manual**

#### **AREA 100 KSA EXERCISES AND ASSESSMENTS**

Exercises and assessments are to be interwoven into the theoretical knowledge training, utilising a range of learning styles; they should address subject or cross-subject topics, with the application of threat and error management (TEM) and, where

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possible, be scenario-based. The exercises and assessments do not need to be confined to a classroom.

- (a) Area 100 KSA exercises may be of short duration within a lesson, and the student's performance in the exercises does not need to be recorded, although the main subject and KSA learning points are likely to be discussed (or for distance learning, reviewed) within a post exercise debrief or lesson summary. To allow for flexibility and development, the exercises do not need to be specified in the training plan.
- (b) When a single formative assessment is specified in the training plan, it is likely to be extensive as it will cover many of the LOs in Area KSA 100 02 and 100 03. Alternatively, an ATO may specify a number of shorter-duration formative assessments that each covers a narrower range of LOs, and these may build in terms of content difficulty.
- (c) The exercises and formative and summative assessments may include but not be limited to: scenario planning exercises combining multiple subjects; practical exercises using training devices (where available); oral communication exercises; written assignments and/or project work; discussions; the preparation and delivery of group or individual presentations and discussions; and enable scenario-based content and individual, pair or group situation(s).
- (d) The type of assessment and the environment should be recorded in the ATO's training plan.

#### GM4 MCAR.ORA.ATO.230(a) Training manual and operations manual

### AREA 100 KSA INSTRUCTION AND ASSESSMENT TRAINING

- (a) The following material has been developed to provide additional guidance to organisations to help them develop an effective KSA 100 instruction and assessment training programme that satisfies the provisions in AMC2 MCAR.ORA.ATO.230 (c) to (f).
- (b) An ATO should ensure that an instructor who conducts the Area 100 KSA formative assessment(s) has received adequate training to be familiar with the:
  - (1) relevant competencies and performance indicators;
  - (2) Area 100 KSA Learning Objectives (LOs);

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- (3) formative assessment(s) that they will conduct including: the applicable LOs, purpose and content of the assessment(s) and position(s) in the training plan, assessment resources, assessment environment;
  - (4) Area 100 KSA grading system, including familiarisation with the performance indicators and the ATO's word pictures; and
  - (5) student debrief methods and procedure.
- (c) An ATO should ensure that an instructor who conducts the Area 100 KSA summative assessments has received adequate training to be familiar with:
- (1) the summative assessments that they will conduct including: the applicable LOs, purpose and content of the exercise(s) and position(s) in the training plan, assessment resources, assessment environment, and the minimum acceptable level;
  - (2) the assessment feedback, evaluation and development process; and
  - (3) KSA candidate appeal procedure.
- (d) An Area 100 KSA instruction and assessment course should include practical training on the conduct of an assessment, including grading to achieve inter-rater reliability, and the debrief under supervision.

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

### INSTRUCTIONAL SYSTEMS DESIGN

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

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

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

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

#### AMC1 MCAR.ORA.ATO.230(b) Training manual and operations manual

### **ALL ATOs, EXCEPT THOSE PROVIDING FLIGHT TEST TRAINING OPERATIONS MANUAL**

The operations manual for use at an ATO conducting integrated or modular flight training courses should include the following:

(a) General:

- (1) a list and description of all volumes in the operations manual;
- (2) administration (function and management);
- (3) responsibilities (all management and administrative staff);
- (4) student discipline and disciplinary action;
- (5) approval or authorisation of flights;
- (6) preparation of flying programme (restriction of numbers of aircraft in poor weather);
- (7) command of aircraft;
- (8) responsibilities of the PIC;
- (9) carriage of passengers;
- (10) aircraft documentation;
- (11) retention of documents;
- (12) flight crew qualification records (licences and ratings);
- (13) revalidation (medical certificates and ratings);
- (14) flight duty period and flight time limitations (flying instructors);
- (15) flight duty period and flight time limitations (students);
- (16) rest periods (flight instructors);
- (17) rest periods (students);
- (18) pilots' log books;
- (19) flight planning (general);
- (20) safety (general): equipment, radio listening watch, hazards, accidents and incidents (including reports), safety pilots etc.

(b) Technical:

- (1) aircraft descriptive notes;
- (2) aircraft handling (including checklists, limitations, maintenance and technical logs, in accordance with relevant requirements, etc.);
- (3) emergency procedures;

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(4) radio and radio navigation aids;

(5) allowable deficiencies (based on the master minimum equipment list (MMEL), if available).

(c) Route:

(1) performance (legislation, take-off, route, landing etc.);

(2) flight planning (fuel, oil, minimum safe altitude, navigation equipment etc.);

(3) loading (load sheets, mass, balance and limitations);

(4) weather minima (flying instructors);

(5) weather minima (students – at various stages of training);

(6) training routes or areas.

(d) Personnel training

(1) appointments of persons responsible for standards/competence of flight personnel;

(2) initial training;

(3) refresher training;

(4) standardisation training;

(5) checks to verify that training personnel is proficient with regard to all internal ATO standards, processes and procedures;

(6) upgrading training;

(7) ATO personnel standards evaluation.

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**SECTION III – ADDITIONAL REQUIREMENTS FOR ATOs PROVIDING SPECIFIC  
TYPES OF TRAINING**

**CHAPTER 1 – DISTANCE LEARNING COURSE**

**MCAR.ORA.ATO.300 General**

The ATO may be approved to conduct modular course programmes using distance learning in the following cases:

- (a) modular courses of theoretical knowledge instruction;
- (b) courses of additional theoretical knowledge for a class or type rating; or
- (c) courses of approved pre-entry theoretical knowledge instruction for a first type rating for a multi-engined helicopter.

**AMC1 MCAR.ORA.ATO.300 General**

**DISTANCE LEARNING**

- (a) A variety of methods is open to ATOs to present course material. It is, however, necessary for ATOs to maintain comprehensive records in order to ensure that students make satisfactory academic progress and meet the time constraints laid down in MCAR Part-FCL for the completion of modular courses.
- (b) The following are given as planning guidelines for ATOs developing the distance learning element of modular courses:
  - (1) an assumption that a student will study for at least 15 hours per week;
  - (2) an indication throughout the course material of what constitutes a week's study;
  - (3) a recommended course structure and order of teaching;
  - (4) one progress test for each subject for every 15 hours of study, which should be submitted to the ATO for assessment. Additional self-assessed progress tests should be completed at intervals of five to 10 study hours;
  - (5) appropriate contact times throughout the course when a student can have access to an instructor by telephone, fax, email or the Internet;

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- (6) measurement criteria to determine whether a student has satisfactorily completed the appropriate elements of the course to a standard that, in the judgement of the HT, or CTKI, will enable them to be entered for the MCAR Part-FCL theoretical examinations with a good prospect of success;
- (7) if the ATO provides the distance learning by help of IT solutions, for example the Internet, instructors should monitor students' progress by appropriate means.
- (c) Where an assessment (e.g. planning, written, scenario or practical exercise, or other assessment) is conducted outside the classroom via distance learning, the ATO should have a procedure or process in place to establish that the student themselves have completed the assessment and that the assessment method(s) for that particular exercise has (have) been effective.

#### **MCAR.ORA.ATO.305 Classroom instruction**

- (a) An element of classroom instruction shall be included in all subjects of modular distance learning courses.
- (b) The amount of time spent in actual classroom instruction shall not be less than 10 % of the total duration of the course.
- (c) To this effect, classroom accommodation shall be available either at the principal place of business of the ATO or within a suitable facility elsewhere.

#### **AMC1 MCAR.ORA.ATO.305(b) Classroom instruction**

Classroom instruction delivered by an instructor to a student may include videoconferencing appropriate to the task if the necessary level of communication is ensured and appropriate equipment and tools are available.

#### **MCAR.ORA.ATO.310 Instructors**

All instructors shall be fully familiar with the requirements of the distance learning course programme.

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### CHAPTER 2 – ZERO FLIGHT-TIME TRAINING

#### MCAR.ORA.ATO.330 General

- (a) Approval for zero flight-time training (ZFTT), as specified in MCAR Part-FCL, shall only be given to ATOs that also have the privileges to conduct commercial air transport operations or ATOs having specific arrangements with commercial air transport operators.
- (b) Approval for ZFTT shall only be given if the operator has at least 90 days of operational experience on the aeroplane type.
- (c) In the case of ZFTT provided by an ATO having a specific arrangement with an operator, the 90 days of operational experience requirements will not apply if the type rating instructor (TRI(A)) involved in the additional take-offs and landings, as required in Part-ORO, has operational experience on the aeroplane type.

#### AMC1 MCAR.ORA.ATO.330 General

##### INITIAL APPROVAL

For an initial approval to conduct ZFTT, the operator should have held an air operator's certificate for commercial air transport for at least 1 year. This period may be reduced where the operator and the ATO have experience of type rating training.

#### MCAR.ORA.ATO.335 Full flight simulator

- (a) The FFS approved for ZFTT shall be serviceable according to the management system criteria of the ATO.
- (b) The motion and the visual system of the FFS shall be fully serviceable, in accordance with the applicable certification specifications for FSTD as mentioned in [MCAR.ORA.FSTD.205](#).



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#### CHAPTER 3 – MULTI-CREW PILOT LICENCE (MPL) COURSES

##### MCAR.ORA.ATO.350 General

The privileges to conduct MPL integrated training courses and MPL instructor courses shall only be given to the ATO if it also has the privilege to conduct commercial air transport operations or a specific arrangement with a commercial air transport operator.

#### CHAPTER 4 – FLIGHT TEST TRAINING

##### MCAR.ORA.ATO.355 Flight test training organisations

- (a) The ATO that has been approved to provide flight test training for the issue of a category 1 or 2 flight test rating in accordance with MCAR Part-FCL may have its privileges extended to providing training for other categories of flight tests and other categories of flight test personnel, provided that:
  - (1) the relevant requirements of MCAR Part-21 are met; and
  - (2) a specific arrangement exists between the ATO and the MCAR Part-21 organisation that employs, or intends to employ, such personnel.
- (b) The training records shall include the written reports by the student, as required by the training programme, including, where applicable, data processing and analysis of recorded parameters relevant to the type of flight test.

**SUBPART FSTD – REQUIREMENTS FOR ORGANISATIONS  
OPERATING FLIGHT SIMULATION TRAINING DEVICES (FSTDs)  
AND THE QUALIFICATION OF FSTDs**

**SECTION I – REQUIREMENTS FOR ORGANISATIONS OPERATING FSTDs**

**MCAR.ORA.FSTD.100 General**

- (a) The applicant for an FSTD qualification certificate shall demonstrate to the DCA that it has established a management system in accordance with MCAR.ORA.GEN Section II. This demonstration shall ensure that the applicant has, directly or through contract, the capability to maintain the performance, functions and other characteristics specified for the FSTD's qualification level and to control the installation of the FSTD.
- (b) If the applicant is the holder of a qualification certificate issued in accordance with this Part, the FSTD specifications shall be detailed:
  - (1) in the terms of the ATO certificate; or
  - (2) in the case of an AOC holder, in the training manual.

**AMC1 MCAR.ORA.FSTD.100 General**

**COMPLIANCE MONITORING PROGRAMME – ORGANISATIONS OPERATING FSTDs**

- (a) Introduction.
  - (1) The purpose of this AMC is to provide additional and specific information to an organisation operating FSTDs on how to establish a compliance monitoring programme (CMP) that enables compliance with the applicable requirements.
- (b) Compliance monitoring programme
  - (1) Typical subject areas for inspections are the following:
    - (i) actual FSTD operation;
    - (ii) maintenance;
    - (iii) technical standards
    - (iv) FSTD safety features.

(c) Audit scope

(1) Organisations operating FSTDs are required to monitor compliance with the procedures they have designed to ensure specified performance and functions. In doing so they should as a minimum, and where appropriate, monitor the following:

- (i) organisation;
- (ii) plans and objectives;
- (iii) maintenance procedures;
- (iv) FSTD qualification level;
- (v) supervision;
- (vi) FSTD technical status;
- (vii) manuals, logs and records;
- (viii) defect deferral;
- (ix) personnel training;
- (x) aircraft modifications;
- (xi) FSTD configuration management.

**AMC2 MCAR.ORA.FSTD.100 General**

**COMPLIANCE MONITORING PROGRAMME – ORGANISATIONS OPERATING FSTDs**

One acceptable means of measuring FSTD performance is contained in MCAR Part-FCL.

**AMC3 MCAR.ORA.FSTD.100 General**

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

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

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- (1) a maintenance facility that provides suitable BITD hardware and software test and maintenance capability;
  - (2) a recording system in the form of a technical log in which defects, deferred defects and development work are listed, interpreted, actioned and reviewed within a specified time scale; and
  - (3) planned routine maintenance of the BITD and periodic running of the qualification test guide (QTG) with adequate manning to cover BITD operating periods and routine maintenance work.
- (b) A planned audit schedule and a periodic review should be used to verify that corrective action was carried out and that it was effective. The auditor should have adequate knowledge of BITDs.

#### GM1 MCAR.ORA.FSTD.100 General

##### COMPLIANCE MONITORING – ORGANISATIONS OPERATING FSTDs – GENERAL

- (a) The concept of compliance monitoring (CM) is a fundamental requirement for organisations operating FSTDs. An effective CM function is vitally important in supporting operation of the devices, in a structured way, to ensure they remain in compliance with the technical standards of CS-FSTD(A) and CS-FSTD(H) and continue to be effective training tools. An effective CM function is also essential to support any level of extended recurrent evaluation period as permitted by [MCAR.ORA.FSTD.225\(b\)](#).
- (b) The following guidance has been developed to provide additional material to help both organisations operating FSTDs and competent authorities in developing effective CM that satisfy the applicable requirements and ensure the highest standards of training are maintained.
- (c) Additional GM provide a compliance checklist for organisations operating FSTDs ([GM2 MCAR.ORA.FSTD.100](#)) and guidance detailing the preparation for an evaluation by the DCA ([GM3 MCAR.ORA.FSTD.100](#)). The compliance checklist should be used by the competent authorities as a standardised checklist for the elements that are expected in the CM function of an organisation operating FSTDs. The organisation should complete as a minimum the second column of the checklist by providing appropriate manual or procedure references for each of the identified elements of the CM function. Additional information can be provided in the third column to aid assessment of the checklist as appropriate. This would then be provided to the DCA. Use of this checklist should assist in ensuring a consistent approach by the competent authorities and also provide organisations operating FSTDs with additional guidance on all the elements of a CM function that the

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competent authorities will expect. The guidance is provided to help organisations operating FSTDs to prepare for authority visits.

- (d) The documentation of the CM may be electronic, provided the necessary controls can be demonstrated. This should include control of any paper copies that may be downloaded for use by individuals. It is recommended that any such copies are automatically designated as uncontrolled as part of the download process. Whilst electronic signatures on master documents may be accepted, with appropriate protections, a hardcopy master of the CM manual should be provided, with wet-ink signatures to be held by the applicant.
- (e) It should be recognised that whatever CM is developed, it will not be effective unless it becomes an integral part of the way in which the organisation works. It includes both the necessary procedures for maintaining compliance with all the applicable requirements and a compliance monitoring programme (CMP) to monitor the execution of these procedures. A successful CM will ensure that the highest training tool is available at all times. If the CM is viewed as an add-on to existing processes it will become a burden and it will never be wholly effective. It should also be noted that compliance control or inspection is only a small part of a CM. If the CM is working effectively, inspections such as fly-outs should become routine revealing little beyond day-to-day unserviceabilities. Systematic defects should be captured by the CMP.
- (f) The DCA should be satisfied that the accountable manager is able to adequately provide the required level of resources to properly support the FSTD. Detailed knowledge of FSTD requirement standards are not necessary, only sufficient to understand his/her responsibility for ensuring the FSTD is properly supported. The assessment of the compliance monitoring manager should concentrate on establishing that the nominee has sufficient knowledge and experience of both CM management and FSTD operations to operate a compliance monitoring system (CMS) within an organisation operating FSTDs. This is likely to require experience of working in the compliance monitoring field and sufficient knowledge of FSTDs and the technical standards with which they should comply.
- (g) If an organisation operating FSTDs is certified under any international quality standard it should assure that it fully covers the applicable organisation requirements of MCAR Part-ORA and the qualification basis.
- (h) For small organisations, it is perfectly acceptable to combine the roles of compliance monitoring manager and accountable manager. For other organisations that hold multiple certificates and may cover multiple sites, it is advantageous to have a common CM function with an overall compliance

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monitoring manager. However, it is essential, particularly where sites may be significantly separated geographically, that there is a nominated representative at each site and possibly for each certificate. These representatives should hold the delegated responsibility of the CM manager for the day-to-day CM role at their site and in their function and have the necessary direct reporting line to the overall CM manager. It will also be necessary to ensure that local representatives are also acceptable to the local DCA. In many cases the local representatives may perform other functions in addition to this role. This is acceptable provided the necessary independence of any compliance monitoring activity is maintained.

- (i) CM, as a whole, begins with the requirements with which the system seeks to comply. These include both the technical standards, in this case the relevant parts of CS-FSTD(A)/(H) plus any other specific standards, for example health and safety regulations, and the compliance monitoring objectives, such as defect rates and rectification intervals and FSTD reliability targets. The CM should define the process by which these standards are made available to those who require them.
- (j) The next part of CM is that part which defines the day-to-day procedures or working practices by which the standards will be achieved. These procedures should include as a minimum defect reporting systems, defect rectification processes, tracking mechanisms, preventative maintenance programmes, spares handling, equipment calibration and configuration management of the device. They should include checks to assess the compliance of the performed actions. These procedures and standards should be made readily available to anybody involved in the maintenance and day-to-day operation of the FSTD.
- (k) The third part of CM is the method by which the organisation operating an FSTD confirms the device is maintained in compliance with the defined standards and is being operated in accordance with the defined procedures. This is the compliance monitoring programme (CMP) and includes the audit methods, reporting and corrective action procedures and feedback, management reviews and schedules for audits of all aspects of the FSTD operation.
- (l) Across all aspects of CM, and most important to it, are the people. CM includes the definition of the responsibilities of all staff and should include a declaration of the minimum levels of resource proposed for the direct support of the FSTD plus the levels of support and managerial staff proposed. The levels of resource can be affected by factors such as local health and safety regulations, existence of weekend and/or night usage of the device(s), etc. CM also includes definition of the skills and experience required for staff and leads to definition of any required training programmes. Training needs cover both technical training and audit training, including QTG running and checking and fly-out techniques for flight crew.

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- (m) The documentation of CM may be provided in any number of documents provided there are appropriate cross-references in all documents such that the system is fully traceable in both directions from end to end. For all but small organisations at least two documents would be expected:
- (1) Firstly, a CM manual containing the policy, terminology, organisational charts and responsibilities, an overview of all processes, within the system, including those for maintaining regulatory compliance such as QTG running and fly-outs (function and subjective testing), CMP including the audit schedule and audit procedures including reporting and corrective action procedures. In addition, the CM manual should include, either directly or by reference, the identification of skills and experience and associated training.
  - (2) Secondly, a procedures manual containing, as a minimum, software and hardware control procedures, configuration control procedures including, for example, control of training loads, updates to visual models, navigation and instructor operation station (IOS) databases, QTG running and checking procedures, fly-out procedures, maintenance procedures including both defect rectification and preventative maintenance processes. Any standard forms and checklists should also be included.
- (n) The CM documentation also includes all records such as technical logs, QTG runs, fly-out reports and maintenance job cards.
- (o) For organisations with several certificates, separate and modular procedures manuals with a single CM manual covering all approvals, may be acceptable.
- (p) It is important to understand the difference between compliance assurance and compliance control. An effective CM will contain elements of both. Compliance control is normally done by inspection of the product; it provides confirmation at the time of the inspection that the product conforms to a defined standard.
- (q) The compliance assurance element is essential to ensure the standard is maintained throughout the periods between product (FSTD) inspections. Within a CMP, the processes are defined that are necessary to provide confidence that the FSTD(s) is/are being supported and maintained to the highest possible standard and in compliance with the relevant requirements. A programme of internal audits is then set in place to confirm that the processes are being followed and are effective. The DCA would normally oversee a certified organisation by process and system audit, however, in the case of FSTDs, authority oversight includes an inspection element in the form of the recurrent FSTD evaluation.
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- (r) In addition to the normal process and system audits, the compliance assurance audit schedule should include the schedule for each FSTD for fly-outs and QTG running through the audit year.
- (s) The audit procedure should include, at least, the following: statement of scope, planning, initiation of audit, collection of evidence, analysis, reporting of findings, identification and agreement of corrective actions and feedback, including reporting significant findings to the DCA, where appropriate. The review of published material could include, in addition to the CM and procedures manuals, QTG records, fly-out reports, technical log sheets, maintenance records and configuration control records.
- (t) In addition to basic knowledge of FSTD requirements and operation, it is expected that auditors have received training in CM and audit techniques.
- (u) The routine fly-outs of the device are a specialised part of the audit programme. It is essential that the pilots tasked with carrying out these fly-outs are adequately experienced. They would be expected to be type rating instructor/examiner (TRI/TRE) qualified on the type, and should have experience of simulator evaluations carried out by the DCA. The assignment of such pilots can present difficulties, particularly for the independent organisation operating FSTDs not directly associated with an airline. It is vital for the organisation to ensure their users are aware of the importance of the fly-outs as part of the continued qualification of the device and the need to assist in the provision of suitably qualified pilots to carry them out. It is worth noting that simulator users are required to satisfy themselves that the training devices they use are assessed for continued suitability, as part of their own CMP. Involvement in fly-outs assists in meeting this need.
- (v) Whilst it is accepted that the number of audits required in an organisation with a single device will be significantly less than those in larger organisations with multiple devices, the CMP should still meet the same criteria, and cover all aspects of the operation within a 12-month period. The independence of the audit personnel should be maintained at all times. The audit programme, whether by full audit or by using a checklist system should still be sufficiently comprehensive to provide the necessary level of confidence that the device is maintained and operated to the highest possible standard. This includes monitoring and review of corrective actions and feedback processes.
- (w) The successful use of sub-contractors who play a significant role in the provision of services, such as maintenance or engineering services, to an organisation operating FSTDs is reliant on the sub-contractor operating under the CM of the organisation. All requirements that an organisation is expected to meet are equally



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applicable to his/her sub-contractor. It is the organisation's responsibility to ensure that the sub-contractor complies with its CM.

- (x) It is essential that a proper understanding of the CM and how it applies to each and every staff member is provided by appropriate training to all, not just those directly involved in operating the CM, such as the accountable manager, the CM manager, representatives and the auditors. The training given to those directly involved in CM should cover the CM, audit techniques and applicable technical standards. CM familiarisation training should be an integral part of any induction training and recurrent training. Update training on technical standards for audit personnel, is also of particular importance.
- (y) Any effective CM will include measurement of its effectiveness. The organisation should develop performance measures that can be monitored against objectives. Such measures, often referred to as metrics, should be reviewed by the DCA as part of its oversight of the CM within the organisation and during recurrent evaluations. In addition, they should form part of the data reviewed during scheduled management reviews as part of the CM.
- (z) ARINC 433 provides good guidance on FSTD compliance measurement. Metrics should monitor not only individual FSTD performance but, for larger organisations, how each FSTD is performing within the fleet. It is also recommended that metrics data be shared, regularly, with the FSTD manufacturers to allow monitoring for generic problems such as design issues, which may be best addressed with a fleet-wide solution.

#### GM2 MCAR.ORA.FSTD.100 General

### COMPLIANCE MONITORING – ASSESSMENT FOR ORGANISATIONS OPERATING FSTDs

COMPLIANCE MONITORING ASSESSMENT FOR ORGANISATIONS OPERATING FSTDs			
Organisation:			
Site Assessed:			
Date of Assessment:			
Accountable Manager:			
Compliance Monitoring Manager:			
Number and Type of FSTDs:			
CM Manual Reference:			
Audit Area	CM/Proc Ref	Comments	Satisfactory Y/N

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<b>1. ACCOUNTABLE MANAGER</b>			
Has an accountable manager (AM) with overall responsibility for compliance monitoring (CM) been nominated?			
Does the accountable manager have corporate authority to ensure all necessary activities can be financed and carried out to the standard required by the DCA?			
Has a formal written compliance policy statement been established, included in the CM manual and signed by the accountable manager?			
<b>2. COMPLIANCE MONITORING MANAGER</b>			
Has a compliance monitoring manager (CM manager) been nominated?			
Are the posts of CM manager and AM combined? If so, is the independence of compliance audits assured?			
Does the CM manager have overall responsibility and authority to: (a) verify that standards are met; and (b) ensure that the compliance monitoring programme is established, implemented and maintained?			
Does the CM manager have direct access to the AM?			
Does the CM manager have access to all parts of the organisation operating an FSTD and as necessary any sub-contractor's organisation?			
<b>3. COMPLIANCE MONITORING (CM)</b>			
Has CM been established by the operator?			
Is CM properly documented? (see Section 4)			
Is the CM structured according to the size and complexity of the operator?			
Does the CM include the following as a minimum: (a) monitoring of compliance with required technical standards; (b) identification of corrective actions and person responsible for rectification; (c) a feedback system to accountable manager to ensure corrective action are promptly addressed;		(a)  (b)  (c)  (d)	

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(d) reporting of significant non-compliances to the DCA; (e) a compliance monitoring programme to verify continued compliance with applicable requirements, standards and procedures.		(e)	
Is the CM structured according to the size and complexity of the operator?			
Are the responsibilities of the CM manager defined to include, as a minimum: (a) monitoring of corrective action programme; (b) ensuring that the corrective actions contain the necessary elements; (c) providing management with an independent assessment of corrective action, implementation and completion; (d) evaluation of the effectiveness		(a)  (b)  (c)  (d)	
Are adequate financial, material and human resources in place to support CM?			
Are management evaluations/reviews of CM held at least quarterly?			
Does the management evaluation ensure that the CMS is working effectively and is it comprehensive and well documented?			
Does the compliance monitoring programme identify the processes necessary and the persons within the organisation who have the training, experience, responsibility and authority to carry out the following: a) schedule and perform quality inspections and audits, including unscheduled audits when required; b) identify and record any concerns or findings, and the evidence necessary to substantiate such concerns or findings; c) initiate or recommend solutions to concerns or findings through designated reporting channels; d) verify the implementation of solutions within specific timescales.		a)  b)  c)  d)	
Is there sufficient auditor resource available and can their required level of independence be demonstrated?			
Do the auditor's report directly to the compliance monitoring manager?			

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Does the defined audit schedule cover the following areas, within each 12-month period? a) organisation b) plans and objectives c) maintenance procedures d) FSTD qualification level; e) supervision f) FSTD technical status g) manuals, logs and records h) defect deferral i) personnel training j) aircraft and simulator configuration management, including Airworthiness Directives		a) b) c) d) e) f) g) h) i) j)	
How are audit non-compliances recorded?			
Are procedures in place to ensure that corrective actions are taken in response to findings?			
Are records of the compliance monitoring programme: a) accurate b) complete and c) readily accessible?		a) b) c)	
Is there an acceptable and effective procedure for providing a briefing on the CM to all personnel?			
Is there an acceptable and effective procedure for ensuring that all those responsible for managing the CM receive training covering: a) an introduction to the concept of the CM; b) compliance management; c) the concept of compliance assurance; d) CM manuals; e) audit techniques; f) reporting and recording; g) how the CM supports continuous improvement within the organisation.		a) b) c) d) e) f) g)	
Are suitable training records maintained?			
Are activities within the CM sub-contracted out to external agencies?			
Do written agreements exist between the organisation and the sub-contractor clearly defining the services and standard to be provided?			

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Are the procedures in place to ensure that the necessary authorisations/ approval when required are held by a sub-contractor?			
Are the procedures in place to establish that the subcontractor has the necessary technical competence?			
<b>4. CM MANUAL</b>			
What is the current status of the CM manual – amendment and issue date?			
Is there a procedure in place to control copies and the distribution of the CM manual?			
Is the CM manual signed by the accountable manager and the compliance monitoring manager?			
Does the CM manual include, either directly or by reference to other documents, the following: a) a description of the organisation; b) reference to appropriate FSTD technical standards; c) allocation of duties and responsibilities; d) audit procedures; e) reporting procedures; f) follow-up and corrective action procedures; g) document retention policy; h) training records		a) b)  c) d) e) f)  g) h)	
Is there a document retention policy covering: a) audit schedules; b) inspection and audit reports; c) responses to findings; d) corrective action reports; e) follow-up and closure reports; f) management evaluation reports.		a) b) c) d) e) f)	
Does the CM manual include, either directly or by reference to other documents, the following procedures for day to day operation of the FSTD: a) defect reporting systems; b) defect rectification processes; c) tracking mechanisms; d) preventative maintenance programmes; e) spares handling; f) equipment calibration;		a) b) c) d) e) f)	

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g) configuration management of the device including visual, IOS and navigation databases; h) configuration control system to ensure the continued integrity of the hardware and software qualified; i) QTG running and function and subjective tests.		g)  h)  i)	
Does the CM manual include, either directly or by reference to other documents, procedures for notification of the competent authorities of the following: a) any change in the organisation including company name, location, management; b) major changes to a qualified device; c) deactivation or relocation of a qualified device; d) major failures of a qualified device; e) major safety issue associated with the installation.		a)  b) c)  d)  e)	
Does the CM manual define acceptable and effective procedures to ensure compliance with applicable health and safety regulations, including: a) safety briefings; b) fire/smoke detection and suppression; c) protection against electrical, mechanical, hydraulic and pneumatic hazards; d) other items as defined in <a href="#">AMC1 MCAR.ORA.FSTD.115</a>		a) b) c)  d)	
Does the CM manual include acceptable and effective procedures for regularly checking FSTD safety features such as emergency stops and emergency lighting, and are such tests recorded?			
<b>5. COMPLIANCE MEASURES</b>			
Have compliance monitoring objectives been developed from the policy statement, and included either directly or by reference in the CMS manual?			
Does the CMS include processes to produce and review appropriate metrics data?			
Do these compliance measures track the following: a) FSTD availability; b) numbers of defects;		a) b)	

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c) open defects; d) defect closure rates; e) training session interrupt rates; f) training session compliance rating.		c) d) e) f)	
Do the compliance measures support the compliance objectives?			

**Required actions/Comments**

Signature: .....

Date: .....

## GM3 MCAR.ORA.FSTD.100 General

## COMPLIANCE MONITORING SYSTEM – GUIDANCE FOR ORGANISATIONS OPERATING FSTDs TO PREPARE FOR A DCA EVALUATION

### (a) Introduction

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

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

(b) Document form

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

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

- (1) type of FSTD and qualification level requested;

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- (2) evaluation agenda: including date of evaluation, name of people involved for the DCA, contact details for the FSTD operator, schedules for the subjective flight profile, QTG rerun;
  - (3) FSTD identification and detailed technical specification including, type of FSTD, manufacturer, registration number, date of entry into service, host computer, visual system, motion system, type of IOS, simulated version(s), standards of all the aircraft computers, if applicable. Manuals needed for an evaluation (e.g. flight manuals, system manuals, acceptance test manual, IOS user manual etc. – if applicable) could already be provided as part of the dossier in an electronic format;
  - (4) planned modifications;
  - (5) subjective open defect(s);
  - (6) airport visual databases including for each visual scene, name of the airport, IATA and ICAO codes, type of visual scene (specific or generic), additional capabilities (e.g. snow model, WGS 84 compliance, enhanced ground proximity warning system (EGPWS)); and
  - (7) QTG status: the list should include for each QTG test available the status of the tests following the FSTD operator and DCA reviews.
- (d) Contents of the dossier for a recurrent evaluation:
- (1) type of FSTD and qualification level requested;
  - (2) evaluation agenda, including date of evaluation, name of people involved for the DCA, contact details for the operator, schedules for the subjective flight profile, QTG rerun and QTG review;
  - (3) FSTD identification, including type of FSTD, manufacturer, registration number, date of entry into service, host computer, visual system, motion system, type of IOS, simulated version(s), standards of all the aircraft computers, if applicable;
  - (4) status of items raised during the last evaluation and date of closure;
  - (5) reliability data: training hours month by month during the past year, numbers of complaints mentioned in the technical log, training hours lost, availability rate;
  - (6) operational data: a list of FSTD users over the previous 12 months should be provided, with number of training hours;
-



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- (7) failure tabulation including categorisation of failures (by ATA chapter and Pareto diagram, ARINC classification);
- (8) details of main failures leading to training interruption or multiple occurrences of some failures;
- (9) hardware and/or software updates or changes since last evaluation and planned hardware and/or software updates or changes;
- (10) subjective open defect(s);
- (11) airport visual databases including for each visual scene, name of the airport, ATA and ICAO codes, type of visual scene (specific or generic), additional capabilities (snow model, WGS 84 compliance, EGPWS);
- (12) QTG status: the list should include for each QTG test available, the date of run during the past year, any comment, and the status of the tests; and
- (13) results of scheduled internal audits and additional quality inspections (if any) since last evaluation and a summary of actions taken.

#### MCAR.ORA.FSTD.105 Maintaining the FSTD qualification

- (a) In order to maintain the qualification of the FSTD, an FSTD qualification certificate holder shall run the complete set of tests contained within the master qualification test guide (MQTG) and functions and subjective tests progressively over a 12-month period.
- (b) The results shall be dated, marked as analysed and evaluated, and retained in accordance with [MCAR.ORA.FSTD.240](#), in order to demonstrate that the FSTD standards are being maintained.
- (c) A configuration control system shall be established to ensure the continued integrity of the hardware and software of the qualified FSTD.

#### MCAR.ORA.FSTD.110 Modifications

- (a) The holder of an FSTD qualification certificate shall establish and maintain a system to identify, assess and incorporate any important modifications into the FSTDs it operates, especially:
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- (1) any aircraft modifications that are essential for training, testing and checking, whether or not enforced by an airworthiness directive; and
  - (2) any modification of an FSTD, including motion and visual systems, when essential for training, testing and checking, as in the case of data revisions.
- (b) Modifications of the FSTD hardware and software that affect handling, performance and systems operation or any major modifications of the motion or visual system shall be evaluated to determine the impact on the original qualification criteria. The organisation shall prepare amendments for any affected validation tests. The organisation shall test the FSTD to the new criteria.
- (c) The organisation shall inform the DCA in advance of any major changes to determine if the tests carried out are satisfactory. The DCA shall determine if a special evaluation of the FSTD is necessary prior to returning it to training following the modification.

#### AMC1 MCAR.ORA.FSTD.110 Modifications

##### GENERAL

- (a) The FSTD, where applicable, should be maintained in a configuration that accurately represents the aircraft being simulated. This may be a specific aircraft tail number or may be a representation of a common standard.
- (b) Users of the device should always establish a differences list for any device they intend to use, and to identify how any differences should be covered in training. In order to ensure each device is maintained in the appropriate configuration, the organisation operating an FSTD should have a system that ensures that all relevant airworthiness directives (ADs) are introduced where applicable on affected FSTDs.
- (c) ADs from both the State of Design of the aircraft and the State where the FSTD is located should be monitored. ADs from the State of Design of an aircraft are usually automatically applicable, unless specifically varied by the aircraft's State of Registry.
- (d) Where appropriate, ADs issued by States where users of the device have aircraft registered should also be monitored. In addition to ADs, the FSTD operator should also put in place processes that ensure all aircraft modifications are reviewed for any effect on training, testing and checking. This can be achieved by reviewing the aircraft manufacturer's service bulletins and may require a specific link to the aircraft manufacturer to be developed. In practice this link is often established through aircraft operators who use the device.

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- (e) Organisations operating FSTDs should notify the DCA of major changes.
- (f) This does not imply that the DCA will always wish to directly evaluate the change. The DCA should be mindful of the potential burden placed on the organisation by a special evaluation and should always consider that burden when deciding if such an evaluation is necessary.
- (g) The organisation operating FSTDs should have an internal acceptance process for modifications, to be used when implementing all modifications, even if the DCA has made a decision to carry out an evaluation.

#### GM1 MCAR.ORA.FSTD.110 Modifications

##### EXAMPLES OF MAJOR MODIFICATIONS

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

- (a) any change that affects the QTG;
- (b) introduction of new standards of equipment such as flight management and guidance computer (FMGC) and updated aerodynamic data packages;
- (c) re-hosting of the FSTD software;
- (d) introduction of features that model new training scenarios; e.g. airborne collision avoidance system (ACAS), EGPWS;
- (e) aircraft modifications that could affect the FSTD qualification; and
- (f) FSTD hardware or software modifications that could affect the handling qualities, performance or system representation.

#### MCAR.ORA.FSTD.115 Installations

- (a) The holder of an FSTD qualification certificate shall ensure that:
    - (1) the FSTD is housed in a suitable environment that supports safe and reliable operation;
    - (2) all FSTD occupants and maintenance personnel are briefed on FSTD safety to ensure that they are aware of all safety equipment and procedures in the FSTD in case of an emergency; and
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- (3) the FSTD and its installations comply with the local regulations for health and safety.
- (b) The FSTD safety features, such as emergency stops and emergency lighting, shall be checked at least annually and recorded.

#### AMC1 MCAR.ORA.FSTD.115 Installations

#### MINIMUM ELEMENTS FOR SAFE OPERATION

##### (a) Introduction

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

##### (b) Expected elements

- (1) Adequate fire/smoke detection, warning and suppression arrangements should be provided to ensure safe passage of personnel from the FSTD.
- (2) Adequate protection should be provided against electrical, mechanical, hydraulic and pneumatic hazards, including those arising from the control loading and motion systems, to ensure maximum safety of all persons in the vicinity of the FSTD.
- (3) Other areas that should be addressed include the following:
  - (i) a two-way communication system that remains operational in the event of a total power failure;
  - (ii) emergency lighting;
  - (iii) escape exits and escape routes;
  - (iv) occupant restraints (seats, seat belts etc.);
  - (v) external warning of motion and access ramp or stairs activity;
  - (vi) danger area markings;
  - (vii) guard rails and gates;
  - (viii) motion and control loading emergency stop controls accessible from either pilot or instructor seats;
  - (ix) a manual or automatic electrical power isolation switch.

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#### GM1 MCAR.ORA.FSTD.115 Installations

##### GENERAL

- (a) The intent of [MCAR.ORA.FSTD.115](#) is to establish that the organisation operating an FSTD has all the necessary procedures in place to ensure that the FSTD installation remains in compliance with all requirements affecting the safety of the device and its users.
- (b) Based on experience, the DCA should pay particular attention to the quality of safety briefings on the FSTD provided to users and instructors, and to the execution of regular checks on the FSTD safety features.
- (c) It is recognised that certain checks, such as that of the emergency stop, can have adverse impact on the FSTD if carried out in full.
- (d) It is acceptable to develop a procedure that protects elements of the device by shutting them down in advance, in a more controlled manner, provided it can be shown that the procedure still demonstrates the whole device can be shut down by the operation of a single emergency stop button, when required.

#### MCAR.ORA.FSTD.120 Additional equipment

Where additional equipment has been added to the FSTD, even though not required for qualification, it shall be assessed by the DCA to ensure that it does not adversely affect the quality of training.

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**SECTION II – REQUIREMENTS FOR THE QUALIFICATION OF FSTDs**

**MCAR.ORA.FSTD.200 Application for FSTD qualification**

- (a) The application for an FSTD qualification certificate shall be made in a form and manner established by the DCA:
- (1) in the case of basic instrument training devices (BITDs), by the BITD manufacturer;
  - (2) in all other cases, by the organisation intending to operate the FSTD.
- (b) Applicants for an initial qualification shall provide the DCA with documentation demonstrating how they will comply with the requirements established in this Regulation. Such documentation shall include the procedure established to ensure compliance with [MCAR.ORA.GEN.130](#) and [MCAR.ORA.FSTD.230](#).

**AMC1 MCAR.ORA.FSTD.200 Application for FSTD qualification**

**LETTER OF APPLICATION FOR INITIAL QUALIFICATION OF AN FSTD; EXCEPT BASIC INSTRUMENT TRAINING DEVICE (BITD)**

A sample of letter of application is provided overleaf.

**Part A**

**To be submitted not less than 3 months prior to requested qualification date**

(Date)

(Office – DCA)

(Address) .....

(City) .....

(Country) .....

Type of FSTD	Aircraft Type/Class	Qualification Level Sought				
		A	B	C	D	Sp./Cat
Full Flight Simulator						
FFS						

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Flight Training Device		1	2	3		
FTD						
Flight and Navigation Procedures Trainer		I	II	III	II MCC	III MCC
FNPT						

Dear,

<Name of Applicant> requests the evaluation of its flight simulation training device <operator's identification of the FSTD> for qualification. The <FSTD manufacturer's name> FSTD with its <visual system and manufacturer's name, if applicable> visual system.

Evaluation is requested for the following configurations and engine fits as applicable:  
e.g. 767 PW/GE and 757RR

1.....

2.....

3.....

Dates requested are: <date(s)> and the FSTD will be located at <place>.

**The objective tests of the QTG will be submitted by <date> and in any event not less than 30 days before the requested evaluation date unless otherwise agreed with the DCA.**

**Comments:**

.....  
.....

**Signed**

.....

Print name: .....

Position/appointment held: .....

Email address: .....

Telephone number: .....

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**Part B**

**To be completed with attached QTG results**

(Date) .....

We have completed tests of the FSTD and declare that it meets all applicable requirements except as noted below.

The following QTG tests still have to be provided:

Tests	Comments

(Add boxes as required)

It is expected that they will be completed and submitted 3 weeks prior to the evaluation date.

Signed

.....

Print name: .....

Position/appointment held: .....

E-mail address: .....

Telephone number: .....

**Part C**

**To be completed not less than 7 days prior to initial evaluation**

(Date)

.....

The FSTD has been assessed by the following evaluation team:

(Name).....

Qualification.....



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(Name).....

Qualification.....

(Name).....

Qualification.....

(Name).....

Pilot's Licence Nr

.....

(Name).....

Flight Engineer's Licence Nr (if app)

.....

- FFS/FTD: This team attests that the <type of FSTD> conforms to the aeroplane flight deck/helicopter cockpit configuration of <name of aircraft operator (if applicable), type of aeroplane/helicopter> aeroplane/helicopter within the requirements for <type of FSTD and level> and that the simulated systems and subsystems function equivalently to those in that aeroplane/helicopter. The pilot of this evaluation team has also assessed the performance and the flying qualities of the FSTD and finds that it represents the designated aeroplane/helicopter.
- FNPT: This team attest(s) that the <type of FSTD> represents the flight deck or cockpit environment of a <aeroplane/helicopter or class of aeroplane/type of helicopter> within the requirements for <type of FSTD and level> and that the simulated systems appear to function as in the class of aeroplane/type of helicopter. The pilot of this evaluation team has also assessed the performance and the flying qualities of the FSTD and finds that it represents the designated class of aeroplane/type of helicopter.

(Additional comments as required)

.....

.....

.....

Signed

.....

Print name: .....

Position/appointment held: .....

E-mail address: .....

Telephone number: .....

## **USE OF FOOTPRINT TESTS IN QUALIFICATION TEST SUBMISSION**

### **(a) Introduction**

- (1) Recent experience during initial qualification of some FFSs has required acceptance of increasing numbers of footprint tests. This is particularly true for FFSs of smaller or older aircraft types, where there may be a lack of aircraft flight test data. However, the large number of footprint tests offered in some QTGs has given rise to concern.
- (2) This guidance is applicable to FFS aeroplane, FTD aeroplane, FFS helicopter and FTD helicopter qualifications.

### **(b) Terminology**

- (1) Footprint test - footprint test data are derived from a subjective assessment carried out on the actual FSTD requiring qualification. The assessment and validation of these data are carried out by a pilot appointed by the DCA. The resulting data are the footprint validation data for the FSTD concerned.

### **(c) Recommendation**

- (1) It is permitted to use footprint data where flight test data is not available. Only when all other alternative possible sources of data have been thoroughly reviewed without success may a footprint test be acceptable, subject to a case-by-case review with the competent authorities concerned, and taking into consideration the level of qualification sought for the FSTD.
- (2) Footprint test data should be:
  - (i) constructed with initial conditions and FFS set up in the appropriate configuration (e.g. correct engine rating) for the required validation data;
  - (ii) a manoeuvre representative of the particular aircraft being simulated;
  - (iii) manually flown out by a type rated pilot who has current experience on type\* and is deemed acceptable by the DCA\*\*;
  - (iv) constructed from validation data obtained from the footprint test manoeuvre and transformed into an automatic test;
  - (v) an automatic test run as a fully integrated test with pilot control inputs; and
  - (vi) automatically run for the initial qualification and recurrent evaluations.

\*In this context, 'current' refers to the pilot experience on the aircraft and not to the MCAR Part-FCL standards.

\*\* The same pilot should sign off the complete test as being fully representative.

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- (3) A clear rationale should be included in the QTG for each footprint test. These rationales should be added to and clearly recorded within the validation data roadmap (VDR) in accordance with and as defined in Appendix 2 to AMC1-CS-FSTD(A).300.
- (4) Where the number of footprint tests is deemed by the DCA to be excessive, the maximum level of qualification may be affected. The DCA should review each area of validation test data where the use of footprint tests as the basis for the validation data is proposed. Consideration should be given to the extent to which footprint tests are used in any given area.

For example, it would be unacceptable if all or the vast majority of take-off tests were proposed as footprint tests, with little or no flight test data being presented. It should be recognised, therefore, that it may be necessary for new flight test data to be gathered if the use of footprint tests becomes excessive, not just overall, but also in specific areas.

- (5) For recurrent evaluation purposes an essential match is to be expected. Validation tests using footprint data which do not provide an essential match should be justified to the satisfaction of the DCA.

The DCA should be consulted at the point of definition of the aircraft data for qualification prior to the procurement of the device if footprint tests need to be used.

#### MCAR.ORA.FSTD.205 Certification specifications for FSTDs

- (a) The DCA shall issue Certification Specifications as standard means to show compliance of FSTDs with the Essential Requirements of MCAR Part 66.
- (b) Such Certification Specifications shall be sufficiently detailed and specific to indicate to applicants the conditions under which qualifications will be issued.

#### MCAR.ORA.FSTD.210 Qualification basis

- (a) The qualification basis for the issuance of an FSTD qualification certificate shall consist of:
- (1) the applicable Certification Specifications established by the DCA that are effective on the date of the application for the initial qualification;

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- (2) the aircraft validation data defined by the mandatory part of the operational suitability data as approved under the Civil Aviation Regulations 2007 as amended, if applicable; and
  - (3) any special conditions prescribed by the DCA if the related Certification Specifications do not contain adequate or appropriate standards for the FSTD because the FSTD has novel or different features to those upon which the applicable Certification Specifications are based.
- (b) The qualification basis shall be applicable for future recurrent qualifications of the FSTD, unless it is re-categorised.

#### MCAR.ORA.FSTD.225 Duration and continued validity

- (a) The full flight simulator (FFS), flight training device (FTD) or flight and navigation procedures trainer (FNPT) qualification shall remain valid subject to:
- (1) the FSTD and the operating organisation remaining in compliance with the applicable requirements;
  - (2) the DCA being granted access to the organisation as defined in [MCAR.ORA.GEN.140](#) to determine continued compliance with the relevant requirements of Civil Aviation Regulation 2007 as amended with its Mauritius Civil Aviation Requirements; and
  - (3) the qualification certificate not being surrendered or revoked.
- (b) The period of 12 months established in MCAR.ARA.FSTD.120(b)(1) may be extended up to a maximum of 36 months, in the following circumstances:
- (1) the FSTD has been subject to an initial and at least one recurrent evaluation that has established its compliance with the qualification basis;
  - (2) the FSTD qualification certificate holder has a satisfactory record of successful regulatory FSTD evaluations during the previous 36 months;
  - (3) the DCA performs a formal audit of the compliance monitoring system defined in [MCAR.ORA.GEN.200\(a\)\(6\)](#) of the organisation every 12 months; and
  - (4) an assigned person of the organisation with adequate experience reviews the regular reruns of the qualification test guide (QTG) and conducts the relevant functions and subjective tests every 12 months and sends a report of the results to the DCA.

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- (c) A BITD qualification shall remain valid subject to regular evaluation for compliance with the applicable qualification basis by the DCA in accordance with MCAR.ARA.FSTD.120.
- (d) Upon surrender or revocation, the FSTD qualification certificate shall be returned to the DCA.

**AMC1 MCAR.ORA.FSTD.225(b) Duration and continued validity**

**EXPERIENCE OF THE ASSIGNED PERSON OR GROUP OF PERSONS**

- (a) A person or a group of persons assigned in accordance with point ORA.FSTD.225(b) should:
  - (1) be qualified in flight simulation hardware, software, computer modelling or equivalent with sufficient technical knowledge and experience to understand and analyse objective test results, and assess that the FSTD complies with the applicable certification specifications;
  - (2) be qualified to assess the performance, handling and features of the FSTD, hold or have held an instructor certificate and meet either of the following:
    - (i) hold(s) or has (have) held a type/class rating on the aircraft being simulated; or
    - (ii) is (are) assisted by an instructor that holds or has held a rating as specified in point (2)(i), with sufficient flying experience in that type/class to support the evaluation team;
  - (3) have been involved at least in an initial evaluation or one recurrent evaluation carried out by a competent authority within the past 36 months.
- (b) The organisation that operates the FSTD should maintain the list of assigned person(s) qualified to perform the task

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#### AMC2 MCAR.ORA.FSTD.225(b) Duration and continued validity

##### EXTENDED RECURRENT EVALUATION PERIOD — ORGANISATION'S DOCUMENTATION

(a) For the purpose of extending the recurrent evaluation period of an FSTD, the organisation that operates the FSTD should provide the following to the competent authority:

- (1) a declaration that the organisation that operates the FSTD fulfils the criteria of point ARA.FSTD.120(c)(1);
- (2) the procedures in accordance with point ARA.FSTD.120(c)(4);
- (3) the qualification and experience of the person(s) assigned in accordance with point ORA.FSTD.225(b);
- (4) the FSTD performance evaluation metrics developed in accordance with AMC2 ORA.FSTD.100 for the previous 2 years;
- (5) the evaluation reports together with the follow-up reports for the previous 2 years.

(b) The assigned person or group of persons should provide a dossier with the same content as for a recurrent evaluation for information to the competent authority 14 days before performing the tasks under point ORA.FSTD.225(b).

Note: Further guidance on the content of the dossier for a recurrent evaluation can be found in GM3 ORA.FSTD.100, point(d).

(c) The assigned person or group of persons should prepare a report following the objective, functions and subjective testing with results, including any items identified during the conduct of the tasks described in point ORA.FSTD.225(b). The report should be submitted to the competent authority within the period specified in point ORA.FSTD.225(b).

#### GM1 MCAR.ORA.FSTD.225(b) Duration and continued validity

An effective compliance monitoring function is necessary to support the implementation of the extended evaluation period. It is essential that an appropriate level of independence be maintained, and the tasks referred to in point ORA.FSTD.225(b) should not be undertaken by a person that, within the previous 12-

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month recurrent period, was involved in the tasks referred to in point ORA.FSTD.105(b) for the relevant FSTD being evaluated.

#### **GM2 MCAR.ORA.FSTD.225(b) Duration and continued validity**

### **PROCESS TO CONDUCT THE FUNCTIONS AND SUBJECTIVE TESTS**

When conducting the functions and subjective tests, especially for a complex motor-powered aircraft, the assigned person or group of persons, when being qualified in accordance with point (a)(2)(i) of AMC1 ORA.FSTD.225(b), should be supported by a pilot who holds or has held a rating on the same or similar type as the aircraft being simulated.

#### **MCAR.ORA.FSTD.230 Changes to the qualified FSTD**

- (a) The holder of an FSTD qualification certificate shall inform the DCA of any proposed changes to the FSTD, such as:
  - (1) major modifications;
  - (2) relocation of the FSTD; and
  - (3) any de-activation of the FSTD.
- (b) In case of an upgrade of the FSTD qualification level, the organisation shall apply to the DCA for an upgrade evaluation. The organisation shall run all validation tests for the requested qualification level. Results from previous evaluations shall not be used to validate FSTD performance for the current upgrade.
- (c) When an FSTD is moved to a new location, the organisation shall inform the DCA before the planned activity along with a schedule of related events.
- (d) Prior to returning the FSTD to service at the new location, the organisation shall perform at least one third of the validation tests, and functions and subjective tests to ensure that the FSTD performance meets its original qualification standard. A copy of the test documentation shall be retained together with the FSTD records for review by the DCA.
- (e) The DCA may perform an evaluation of the FSTD after relocation. The evaluation shall be in accordance with the original qualification basis of the FSTD.
- (f) If an organisation plans to remove an FSTD from active status for prolonged periods, the DCA shall be notified and suitable controls established for the period during which the FSTD is inactive.

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- (g) The organisation shall agree with the DCA a plan for the de-activation, any storage and re-activation to ensure that the FSTD can be restored to active status at its original qualification level.

#### AMC1 MCAR.ORA.FSTD.230(b) Changes to the qualified FSTD

##### UPDATING AND UPGRADING EXISTING FSTDs

- (a) An update is a result of a change to the existing device where it retains its existing qualification level. The change may be certified through a recurrent inspection or an extra inspection if deemed necessary by the DCA according to the applicable requirements in effect at the time of initial qualification.
- (b) If such a change to an existing device would imply that the performance of the device could no longer meet the requirements at the time of initial qualification, but that the result of the change would, in the opinion of the DCA, clearly mean an improvement to the performance and training capabilities of the device altogether, then the DCA might accept the proposed change as an update while allowing the device to retain its original qualification level.

#### AMC1 MCAR.ORA.FSTD.230(b) Changes to the qualified FSTD

##### UPDATING AND UPGRADING EXISTING FSTDs

- (a) An update is a result of a change to the existing device where it retains its existing qualification level. The change may be certified through a recurrent inspection or an extra inspection if deemed necessary by the DCA according to the applicable requirements in effect at the time of initial qualification.
- (b) If such a change to an existing device would imply that the performance of the device could no longer meet the requirements at the time of initial qualification, but that the result of the change would, in the opinion of the DCA, clearly mean an improvement to the performance and training capabilities of the device altogether, then the DCA might accept the proposed change as an update while allowing the device to retain its original qualification level.
- (c) An upgrade is defined as the raising of the qualification level of a device, or an increase in training credits, which can only be achieved by undergoing an initial qualification according to the latest applicable requirements.



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- (d) As long as the qualification level of the device does not change, all changes made to the device should be considered to be updates pending approval by the DCA.
- (e) An upgrade, and consequent initial qualification according to the latest applicable requirements, is only applicable when the organisation requests another qualification level (recategorisation) for the FSTD.

#### **MCAR.ORA.FSTD.235 Transferability of an FSTD qualification**

- (a) When there is a change of the organisation operating an FSTD, the new organisation shall inform the DCA in advance in order to agree upon a plan of transfer of the FSTD.
- (b) The DCA may perform an evaluation in accordance with the original qualification basis of the FSTD.
- (c) When the FSTD no longer complies with its initial qualification basis, the organisation shall apply for a new FSTD qualification certificate.

#### **MCAR.ORA.FSTD.240 Record-keeping**

The holder of an FSTD qualification certificate shall keep records of:

- (a) all documents describing and proving the initial qualification basis and level of the FSTD for the duration of the FSTD's lifetime; and
- (b) any recurrent documents and reports related to each FSTD and to compliance monitoring activities for a period of at least 5 years.

#### **AMC1 MCAR.ORA.FSTD.240 Record-keeping**

##### **FSTD RECORDS**

- (a) FSTD records to be kept should include the following:
  - (1) for the lifetime of the device:
    - (i) the master QTG (MQTG) of the initial evaluation;
    - (ii) the qualification certificate of the initial evaluation; and
    - (iii) the initial evaluation report;
  - (2) for a period of at least 5 years (in paper or electronic format):

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- (i) recurrent QTG runs;
- (ii) recurrent evaluation reports;
- (iii) reports of internal functions and subjective testing;
- (iv) technical log;
- (v) CMS report;
- (vi) audit schedule;
- (vii) evaluation programme;
- (viii) management evaluation reports;
- (ix) obsolete procedures and forms.

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**SUBPART AeMC – AERO-MEDICAL CENTRES**

**SECTION 1 - GENERAL**

**MCAR.ORA.AeMC.105 Scope**

This Subpart establishes the additional requirements to be met by an organisation to qualify for the issue or continuation of an approval as an aero-medical centre (AeMC) to issue medical certificates, including initial class 1 medical certificates.

**GM1 MCAR.ORA.AeMC.105 Scope**

It is recommended that AeMCs provide support to regional AME peer groups in order to enhance professional expertise.

**MCAR.ORA.AeMC.115 Application**

Applicants for an AeMC certificate shall:

- (a) comply with MED.D.005; and
- (b) in addition to the documentation for the approval of an organisation required in [MCAR.ORA.GEN.115](#), provide details of clinical attachments to or liaison with designated hospitals or medical institutes for the purpose of specialist medical examinations.

**AMC1 MCAR.ORA.AeMC.115 Application**

**GENERAL**

- (a) The documentation for the approval of an AeMC should include the names and qualifications of all medical staff, and of supporting specialist consultants, and a list of medical and technical facilities for initial class 1 and class 3 aero-medical examinations as applicable according to the scope of the AeMC approval.
- (b) Medical staff should be sufficient to perform the standard required medical examinations to be performed within the organisation of the AeMC.

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- (c) The standard required medical examinations should at least encompass the following specialities: ophthalmology including colour vision, otorhinolaryngology, cardiology and mental health.
- (d) Contracted activities with designated hospitals or medical institutes for the purpose of additional specialist medical examinations include clinical attachments or liaison with hospitals, medical institutions and/or specialists.

#### MCAR.ORA.AeMC.135 Continued validity

The AeMC certificate shall be issued for an unlimited duration. It shall remain valid subject to the holder and the aero-medical examiners of the organisation:

- (a) complying with MED.D.030; and
- (b) ensuring their continued experience by performing an adequate number of class 1 medical examinations every year.

#### AMC1 MCAR.ORA.AeMC.135 Continued validity

#### EXPERIENCE

- (a) A total of at least 200 class 1, class 3 or equivalent military aero-medical examinations and assessments should be performed at an AeMC every year.
- (b) In Member States where the number of aero-medical examinations and assessments mentioned in point (a) cannot be reached due to a low number of professional pilots, or ATCOs, a proportionate number as defined by the competent authority, of class 1 or class 3 aero-medical examinations and assessments should be performed.
- (c) In these cases, the continued experience of the AeMCs in an and AeMC may also be ensured by them performing aero-medical examinations and assessments for:
  - (1) class 2 medical certificates as established in Part-MED; and/or
  - (2) third country class 1, class 3 equivalent military medical certificates.
- (d) Aero-medical research including publication in peer reviewed journals may also be accepted as contributing to the continued experience of the AMEs in, an AeMC.

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### SECTION II - MANAGEMENT

#### MCAR.ORA.AeMC.200 Management system

The AeMC shall establish and maintain a management system that includes the items addressed in [MCAR.ORA.GEN.200](#) and, in addition, processes:

- (a) for medical certification in compliance with Part-MED; and
- (b) to ensure medical confidentiality at all times.

#### AMC1 MCAR.ORA.AeMC.200 Management system

- (a) In order to maintain personnel trained and competent to perform their tasks as specified in ORA.GEN.200(a)(4), the management system should ensure that each AME performs a sufficient number of aero-medical examinations and assessments to meet the professional standards of an AeMC. The required activity of each AME should be specified in the management system.
- (b) The management system should encompass regular exchange of professional expertise including case analysis

#### GM1 MCAR.ORA.AeMC.200 Management system

#### RESEARCH

If aero-medical research is conducted at an AeMC, its management system should include processes to conduct that research and publish the results.

#### GM2 MCAR.ORA.AeMC.200 Management system

The assessment of the AeMC's management system by a national health authority may be a part of the AeMC's overall management system.

#### AMC1 MCAR.ORA.AeMC.205(a) Contracted activities

In addition to the documentation for the approval of an organisation listed in AMC1 ORA.GEN.205, the AeMC should provide a written declaration of their subcontractor

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that contracted examinations or assessments will be performed on the basis of the requirements of MCAR Part MED and associated AMC and GM.

#### MCAR.ORA.AeMC.210 Personnel requirements

- (a) The AeMC shall:
- (1) have an aero-medical examiner (AME) nominated as head of the AeMC, with privileges to issue class 1 medical certificates and sufficient experience in aviation medicine to exercise his/her duties; and
  - (2) have on staff an adequate number of fully qualified AMEs and other technical staff and experts.
- (b) The head of the AeMC shall be responsible for coordinating the assessment of examination results and signing reports, certificates, and initial class 1 medical certificates.

#### AMC1 MCAR.ORA.AeMC.210 Personnel requirements

##### GENERAL

- (a) An aero-medical examiner (AME) should have held AME as applicable in accordance with the scope defined in the terms of approval attached to the AeMC's certificate privileges and have performed at least 200 aero-medical examinations and assessments for a class 1, class 3 or equivalent military medical certificate before being nominated as head of an AeMC.

#### MCAR.ORA.AeMC.215 Facility requirements

The AeMC shall be equipped with medico-technical facilities adequate to perform aero-medical examinations necessary for the exercise of the privileges included in the scope of the approval.

#### AMC1 MCAR.ORA.AeMC.215 Facility requirements

##### MEDICAL-TECHNICAL FACILITIES

The medical-technical facilities of an AeMC should consist of the equipment of a general medical practice and, in addition, of equipment for:

- (a) Cardiology
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Facilities to perform:

- (1) 12-lead resting ECG;

(b) Ophthalmology

Facilities for the examination of:

- (1) near, intermediate and distant vision;
- (2) external eye, anatomy, media and funduscopy;
- (3) ocular motility;
- (4) binocular vision;
- (5) colour vision (anomaloscopy or equivalent);
- (6) visual fields;
- (7) refraction; and
- (8) heterophoria and
- (9) contrast sensitivity, including mesopic conditions with and without glare

(c) Hearing

- (1) pure-tone audiometer

(d) Otorhinolaryngology (ENT)

Facilities for the clinical examination of mouth and throat and:

- (1) otoscopy;
- (2) rhinoscopy;
- (3) tympanometry or equivalent; and
- (4) clinical assessment of vestibular system.

(e) Examination of pulmonary function

- (1) spirometry

(f) The following facilities should be available at the AeMC or arranged through contracted activities:

- (1) clinical laboratory facilities; and
  - (2) ultrasound of the abdomen.
  - (3) exercise ECG;
  - (4) 24-hour heart rhythm monitoring;
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- (5) 24-hour blood pressure monitoring; and
- (6) mental health assessment including psychometric testing.

#### MCAR.ORA.AeMC.220 Record-keeping

In addition to the records required in [MCAR.ORA.GEN.220](#), the AeMC shall:

- (a) maintain records with details of medical examinations and assessments performed for the issue, revalidation or renewal of medical certificates and their results, for a minimum period of 10 years after the last examination date; and
- (b) keep all medical records in a way that ensures that medical confidentiality is respected at all times.