

Subpart FC – Flight crew

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

OPERATIONAL MULTI-PILOT LIMITATION (OML)

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

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

ROUTE/AREA AND AERODROME KNOWLEDGE FOR COMMERCIAL AIR TRANSPORT OPERATIONS

For commercial air transport (CAT) operations, the experience of the route or area to be flown and of the aerodrome facilities and procedures to be used should include the following:

(a) Area and route knowledge

- (1) Area and route training should include knowledge of:
 - (i) terrain and minimum safe altitudes;
 - (ii) seasonal meteorological conditions;
 - (iii) meteorological, communication and air traffic facilities, services and procedures;
 - (iv) search and rescue procedures where available; and
 - (v) navigational facilities associated with the area or route along which the flight is to take place.
- (2) Depending on the complexity of the area or route, as assessed by the operator, the following methods of familiarisation should be used:
 - (i) for the less complex areas or routes, familiarisation by self-briefing with route documentation, or by means of programmed instruction; and
 - (ii) in addition, for the more complex areas or routes, in-flight familiarisation as a pilot-in-command/commander or co-pilot under supervision, observer, or familiarisation in a flight simulation training device (FSTD) using a database appropriate to the route concerned.

(b) Aerodrome knowledge

- (1) Aerodrome training should include knowledge of obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, applicable operating minima and ground movement considerations.
- (2) The operations manual should describe the method of categorisation of aerodromes and, in the case of CAT operations, provide a list of those aerodrome categorised as B or C.
- (3) All aerodromes to which an operator operates should be categorised in one of these three categories:
 - (i) category A - an aerodrome that meets all of the following requirements:
 - (A) an approved instrument approach procedure;

- (B) at least one runway with no performance limited procedure for take-off and/or landing;
 - (C) published circling minima not higher than 1 000 ft above aerodrome level; and
 - (D) night operations capability.
- (ii) category B - an aerodrome that does not meet the category A requirements or which requires extra considerations such as:
 - (A) non-standard approach aids and/or approach patterns;
 - (B) unusual local weather conditions;
 - (C) unusual characteristics or performance limitations; or
 - (D) any other relevant considerations including obstructions, physical layout, lighting etc.
 - (iii) category C - an aerodrome that requires additional considerations to a category B aerodrome;
 - (iv) offshore installations may be categorised as category B or C aerodromes, taking into account the limitations determined in accordance with AMC2 CAT.OP.MPA.105 Use of aerodromes and operating sites.
- (c) Prior to operating to a:
- (1) category B aerodrome, the pilot-in-command/commander should be briefed, or self-briefed by means of programmed instruction, on the category B aerodrome(s) concerned. The completion of the briefing should be recorded. This recording may be accomplished after completion or confirmed by the pilot-in-command/commander before departure on a flight involving category B aerodrome(s) as destination or alternate aerodromes.
 - (2) category C aerodrome, the pilot-in-command/commander should be briefed and visit the aerodrome as an observer and/or undertake instruction in a suitable FSTD. The completion of the briefing, visit and/or instruction should be recorded.

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

ROUTE/AREA AND AERODROME RECENCY

- (a) The 12-month period should be counted from the last day of the month:
 - (1) when the familiarisation training was undertaken; or
 - (2) of the latest operation on the route or area to be flown and of the aerodromes, facilities and procedures to be used.
- (b) When the operation is undertaken within the last 3 calendar months of that period, the new 12-month period should be counted from the original expiry date.

AMC2 ORO.FC.105(c) Designation as pilot-in-command/commander

ROUTE/AREA AND AERODROME RECENCY - PERFORMANCE CLASS B AEROPLANES OPERATED UNDER VFR BY NIGHT OR IFR IN CAT OPERATIONS

In the case of CAT operations with performance class B aeroplanes operating under visual flight rules (VFR) by night or instrument flight rules (IFR), the knowledge should be maintained as follows:

- (a) except for operations to the most demanding aerodromes, by completion of at least 10 flight sectors within the area of operation during the preceding 12 months in addition to any required self-briefing;
- (b) operations to the most demanding aerodromes may be performed only if:
 - (1) the pilot-in-command/commander has been qualified at the aerodrome within the preceding 36 months by a visit as an operating flight crew member or as an observer;
 - (2) the approach is performed in visual meteorological conditions (VMC) from the applicable minimum sector altitude; and
 - (3) an adequate self-briefing has been made prior to the flight.

GM1 ORO.FC.105(d) Designation as pilot-in-command/commander

PERFORMANCE CLASS B AEROPLANES OPERATED UNDER VFR BY DAY IN CAT OPERATIONS

For CAT operations under VFR by day with performance class B aeroplanes, the operator should take account of any requirement that might be stipulated in specific cases by the State of the aerodrome.

AMC1 ORO.FC.125 Differences training and familiarisation training

GENERAL

- (a) Differences training requires additional knowledge and training on the aircraft or an appropriate training device. It should be carried out:
 - (1) when introducing a significant change of equipment and/or procedures on types or variants currently operated; and
 - (2) in the case of aeroplanes, when operating another variant of an aeroplane of the same type or another type of the same class currently operated; or
 - (3) in the case of helicopters, when operating a variant of a helicopter currently operated.
- (b) Familiarisation training requires only the acquisition of additional knowledge. It should be carried out when:
 - (1) operating another helicopter or aeroplane of the same type; or
 - (2) when introducing a significant change of equipment and/or procedures on types or variants currently operated.

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

NON-MANDATORY (RECOMMENDATION) ELEMENTS

When developing the training programmes and syllabi, the operator should consider the non-mandatory (recommendation) elements for the relevant type that are provided in the data established in accordance with Regulation (EC) No 1702/2003⁸.

⁸ OJ L 243, 27.9.2003, p. 6.

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

FULL FLIGHT SIMULATORS (FFS)

The operator should classify any differences between the aircraft and FFS in accordance with the Air Transport Association (ATA) chapters as follows:

Compliance Levels

(a) Level A differences:

- (1) no influence on flight characteristics;
- (2) no influence on procedures (normal and/or abnormal);
- (3) differences in presentation; and
- (4) differences in operation.

Method: self-instruction via the operations manual or flight crew information.

(b) Level B differences:

- (1) no influence on flight characteristics;
- (2) influence on procedures (normal and/or abnormal); and
- (3) possible differences in presentation and operation.

Method: flight crew information, computer-based training, system device training or special instruction by instructor.

(c) Level C differences:

- (1) influence on flight characteristics;
- (2) influence on procedures (normal and/or abnormal); and
- (3) eventually differences in presentation and operation.

Method: special instruction by instructor, a selected partial training on another FSTD or aircraft or a waiver because of previous experience, special instruction or training programme.

(d) Level D differences:

- (1) influence on flight characteristics; and/or
- (2) influence on procedures (normal and/or abnormal); and/or
- (3) differences in presentation and/or operation; and
- (4) FSTD is level D qualified and is used for zero flight-time training (ZFTT).

Method: a specified partial training on another FSTD or aircraft or a waiver because of previous experience, special instruction or training programme.

AMC1 ORO.FC.200(a) Composition of flight crew

CREWING OF INEXPERIENCED FLIGHT CREW MEMBERS

The operator should establish procedures in the operations manual taking into account the following elements:

Aeroplanes

- (a) The operator should consider that a flight crew member is inexperienced, following completion of a type rating or command course, and the associated line flying under supervision, until he/she has achieved on the type either:**

- (1) 100 flight hours and flown 10 sectors within a consolidation period of 120 consecutive days; or
- (2) 150 flight hours and flown 20 sectors (no time limit).
- (b) A lesser number of flight hours or sectors, subject to any other conditions that the competent authority may impose, may be acceptable to the competent authority when one of the following applies:
 - (1) a new operator is commencing operations;
 - (2) an operator introduces a new aeroplane type;
 - (3) flight crew members have previously completed a type conversion course with the same operator;
 - (4) credits are defined in the data established in accordance with Regulation (EC) No 1702/2003; or
 - (5) the aeroplane has a maximum take-off mass of less than 10 tonnes or a maximum operational passenger seating configuration (MOPSC) of less than 20.

Helicopters

- (c) The operator should consider that, when two flight crew members are required, a flight crew member, following completion of a type rating or command course, and the associated line flying under supervision, is inexperienced until either:
 - (1) he/she has achieved 50 flight hours on the type and/or in the role within a period of 60 days; or
 - (2) he/she has achieved 100 flight hours on the type and/or in the role (no time limit).
- (d) A lesser number of flight hours, on the type and/or in the role, and subject to any other conditions which the competent authority may impose, may be acceptable to the competent authority when one of the following applies:
 - (1) a new operator is commencing operations;
 - (2) an operator introduces a new helicopter type;
 - (3) flight crew members have previously completed a type conversion course with the same operator (reconversion); or
 - (4) credits are defined in the data established in accordance with Regulation (EC) No 1702/2003.

AMC1 ORO.FC.205 Command course

COMBINED UPGRADING AND CONVERSION COURSE – HELICOPTER

If a pilot is converting from one helicopter type or variant to another when upgrading to commander:

- (a) the command course should also include a conversion course in accordance with ORO.FC.220; and
- (b) additional flight sectors should be required for a pilot transitioning onto a new type of helicopter.

AMC1 ORO.FC.115&215 Crew resource management (CRM) training

CRM TRAINING – CAT OPERATIONS

- (a) General

EN

EN

- (1) CRM training should reflect the culture of the operator as well as type of operation and be conducted by means of both classroom training and practical exercises including group discussions and accident and serious incident reviews to analyse communication problems and instances or examples of a lack of information or crew management.
 - (2) Whenever it is practicable to do so, consideration should be given to conducting relevant parts of CRM training in FSTDs that reproduce, in an acceptable way, a realistic operational environment and permit interaction. This includes, but is not limited to, appropriate line-oriented flight training (LOFT) scenarios conducted in FSTDs.
 - (3) It is recommended that, whenever possible, initial CRM training be conducted in a group session away from the pressures of the usual working environment so that the opportunity is provided for flight crew members to interact and communicate in an environment conducive to learning.
- (b) Initial CRM Training
- (1) Initial CRM training programmes are designed to provide knowledge of, and familiarity with, human factors relevant to flight operations. The course duration should be a minimum of 1 day for single-pilot operations and 2 days for all other types of operations. It should cover all the elements indicated in (f).
 - (2) The CRM trainer should:
 - (i) possess group facilitation skills;
 - (ii) have and maintain adequate knowledge of the operation and the aircraft type, preferably through current CAT experience as a flight crew member;
 - (iii) have successfully passed the human performance and limitations (HPL) examination whilst recently obtaining the airline transport pilot licence (ATPL) in accordance with Regulation (EU) No 1178/2011⁹; or followed a theoretical HPL course covering the whole syllabus of the HPL examination;
 - (iv) have completed initial CRM training;
 - (v) have received additional education in the fields of group management, group dynamics and personal awareness; and
 - (vi) be supervised by suitably qualified CRM training personnel when conducting his/her first initial CRM training session.
 - (3) The operator should ensure that initial CRM training addresses the nature of the operations of the operator concerned, as well as the associated procedures and the culture of the operator. This will include areas of operations that produce particular difficulties or involve adverse climatic conditions and any unusual hazards.
 - (4) If the operator does not have sufficient means to establish initial CRM training, use may be made of a course provided by another operator, or a third party or training organisation. In this event the operator should ensure that the content of the course meets his/her operational requirements. When crew members from several companies follow the same course, CRM core elements should be specific to the nature of operations of the companies and the trainees concerned.

⁹ OJ L 311, 25.11.2011, p. 1.

- (5) The flight crew member's CRM skills should not be assessed during initial CRM training.
- (c) Operator conversion course – CRM training
 - (1) If the flight crew member undergoes a conversion course with a change of aircraft type, elements of CRM should be integrated into all appropriate phases of the operator's conversion course, in accordance with (f).
 - (2) If the flight crew member undergoes a conversion course with a change of operator, elements of CRM should be integrated into all appropriate phases of the operator's conversion course, in accordance with (f).
 - (3) The flight crew member should not be assessed when completing elements of CRM training that are included in the operator conversion course.
- (d) Command course – CRM training
 - (1) The operator should ensure that elements of CRM are integrated into the command course in accordance with (f).
 - (2) The flight crew member should not be assessed when completing elements of CRM training that are included in the command course, although feedback should be given.
- (e) Recurrent CRM training
 - (1) The operator should ensure that:
 - (i) elements of CRM are integrated into all appropriate phases of recurrent training every year, in accordance with (f), and that modular CRM training covers the same areas over a maximum period of 3 years; and
 - (ii) relevant modular CRM training is conducted by CRM trainers qualified according to (b)(2).
 - (2) The flight crew member should not be assessed when completing elements of CRM training that are included in the recurrent training.
- (f) Implementation of CRM
 - (1) Table 1 indicates which elements of CRM should be included in each type of training.

Table 1: Elements of CRM to be included in training

Core Elements	Initial CRM Training	Operator conversion course when changing type	Operator conversion course when changing operator	Command course	Recurrent training
Human error and reliability, error chain, error prevention and detection		In-depth	Overview	Overview	
Operator safety culture, standard operating procedures (SOPs), organisational factors		Not required	In-depth		
Stress, stress management, fatigue & vigilance					
Information acquisition and processing situation awareness, workload management	In-depth		Not required	In-depth	Overview
Decision making					
Communication and coordination inside and outside the flight crew compartment		Overview	Overview		
Leadership and team behaviour synergy					
Automation, philosophy of the use of automation (if relevant to the type)	As required	In-depth	In-depth	As required	As required
Specific type-related differences			Not required		
Case studies	In-depth	In-depth	In-depth	In-depth	In-depth

- (g) Coordination between flight crew and cabin/technical crew training
 - (1) Operators should, as far as practicable, provide combined training for flight crew and cabin/technical crew including briefing and debriefing.
 - (2) There should be an effective liaison between flight crew and cabin/technical crew training departments. Provision should be made for transfer of relevant knowledge and skills between flight and cabin/technical crew instructors.
- (h) Assessment of CRM skills
 - (1) Assessment of CRM skills is the process of observing, recording, interpreting and debriefing crews and crew member's performance and knowledge using an acceptable methodology in the context of overall performance. It includes the concept of self-critique, and feedback which can be given continuously during training or in summary following a check. In order to enhance the effectiveness of the programme this methodology should, where possible, be agreed with flight crew representatives.
 - (2) NOTECHS (non-technical skills evaluation) or other acceptable methods of assessment should be used. The selection criteria and training requirements of the assessors and their relevant qualifications, knowledge and skills should be established.
 - (3) Assessment of CRM skills should:
 - (i) provide feedback to the crew and the individual and serve to identify retraining where needed; and
 - (ii) be used to improve the CRM training system.
 - (4) Prior to the introduction of CRM skills assessment, a detailed description of the CRM methodology including terminology used should be published in the operations manual.
 - (5) Methodology of CRM skills assessment
 - (i) The operator should establish the CRM training programme including an agreed terminology. This should be evaluated with regard to methods, length of training, depth of subjects and effectiveness.
 - (ii) A training and standardisation programme for training personnel should then be established.
 - (iii) The assessment should be based on the following principles:
 - (A) only observable, repetitive behaviours are assessed;
 - (B) the assessment should positively reflect any CRM skills that result in enhanced safety;
 - (C) assessments should include behaviour that contributes to a technical failure, such technical failure being errors leading to an event that requires debriefing by the person conducting the line check; and
 - (D) the crew and, where needed, the individual are verbally debriefed.
 - (6) De-identified summaries of all CRM assessments by the operator should be used to provide feedback and such feedback should be used to update and improve the operator's CRM training.
 - (7) Operators should establish procedures, including retraining, to be applied in the event that personnel do not achieve or maintain the required standards.
 - (8) If the operator proficiency check is combined with the type rating revalidation/renewal check, the assessment of CRM skills should satisfy the

multi-crew cooperation requirements of the type rating revalidation/renewal. This assessment should not affect the validity of the type rating.

- (i) Levels of training
 - (1) Overview. When overview training is required it should normally be instructional in style. Such training should refresh knowledge gained in earlier training.
 - (2) In-depth. When in-depth training is required it should normally be interactive in style and should include, as appropriate, case studies, group discussions, role play and consolidation of knowledge and skills. Core elements should be tailored to the specific needs of the training phase being undertaken.
- (j) Use of automation
 - (1) The operator conversion course should include training in the use and knowledge of automation and in the recognition of systems and human limitations associated with the use of automation. The operator should therefore ensure that the flight crew member receives training on:
 - (i) the application of the operations policy concerning the use of automation as stated in the operations manual; and
 - (ii) system and human limitations associated with the use of automation.
 - (2) The objective of this training should be to provide appropriate knowledge, skills and behavioural patterns for managing and operating automated systems. Special attention should be given to how automation increases the need for crews to have a common understanding of the way in which the system performs, and any features of automation that make this understanding difficult.

AMC1.1 ORO.FC.115&.215 Crew resource management (CRM) training

CRM TRAINER

The acceptable means of compliance are as set out in AMC1 ORO.FC.115&.215, except for (b)(2) of that AMC, for which the following qualifications and experience are also acceptable for a CRM trainer:

- (a) a flight crew member holding a recent qualification as a CRM trainer may continue to be a CRM trainer even after the cessation of active flying duties;
- (b) an experienced non-flight crew CRM trainer having a knowledge of HPL; and
- (c) a former flight crew member having knowledge of HPL may become a CRM trainer if he/she maintains adequate knowledge of the operation and aircraft type and meets the provisions of AMC1 ORO.FC.115&.215, (b)(2)(i), (iv), (v) and (vi).

GM1 ORO.FC.115&.215 Crew resource management (CRM) training

GENERAL

- (a) Crew resource management (CRM) is the effective utilisation of all available resources (e.g. crew members, aircraft systems, supporting facilities and persons) to achieve safe and efficient operation.
- (b) The objective of CRM is to enhance the communication and management skills of the flight crew member concerned. The emphasis is placed on the non-technical aspects of flight crew performance.

AMC1 ORO.FC.220 Operator conversion training and checking

OPERATOR CONVERSION TRAINING SYLLABUS

(a) General

- (1) The operator conversion training should include, in the following order:
 - (i) ground training and checking, including aircraft systems, and normal, abnormal and emergency procedures;
 - (ii) emergency and safety equipment training and checking, (completed before any flight training in an aircraft commences);
 - (iii) flight training and checking (aircraft and/or FSTD); and
 - (iv) line flying under supervision and line check.
- (2) When the flight crew member has not previously completed an operator's conversion course, he/she should undergo general first-aid training and, if applicable, ditching procedures training using the equipment in water.
- (3) Where the emergency drills require action by the non-handling pilot, the check should additionally cover knowledge of these drills.
- (4) The operator's conversion may be combined with a new type/class rating training as required by Regulation (EU) No 1178/2011.
- (5) The operator should ensure that the personnel integrating elements of CRM into conversion training are suitably qualified.

(b) Ground training

- (1) Ground training should comprise a properly organised programme of ground instruction supervised by training staff with adequate facilities, including any necessary audio, mechanical and visual aids. Self-study using appropriate electronic learning aids, computer-based training (CBT) etc. may be used with adequate supervision of the standards achieved. However, if the aircraft concerned is relatively simple, unsupervised private study may be adequate if the operator provides suitable manuals and/or study notes.
- (2) The course of ground instruction should incorporate formal tests on such matters as aircraft systems, performance and flight planning, where applicable.

(c) Emergency and safety equipment training and checking

- (1) Emergency and safety equipment training should take place in conjunction with cabin/technical crew undergoing similar training with emphasis on coordinated procedures and two-way communication between the flight crew compartment and the cabin.
- (2) On the initial conversion course and on subsequent conversion courses as applicable, the following should be addressed:
 - (i) Instruction on first-aid in general (initial conversion course only); instruction on first-aid as relevant to the aircraft type of operation and crew complement including those situations where no cabin crew is required to be carried (initial and subsequent).
 - (ii) Aero-medical topics including:
 - (A) hypoxia;
 - (B) hyperventilation;

- (C) contamination of the skin/eyes by aviation fuel or hydraulic or other fluids;
 - (D) hygiene and food poisoning; and
 - (E) malaria.
- (iii) The effect of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment.
 - (iv) Actual fire fighting, using equipment representative of that carried in the aircraft on an actual or simulated fire except that, with Halon extinguishers, an alternative extinguisher may be used.
 - (v) The operational procedures of security, rescue and emergency services.
 - (vi) Survival information appropriate to their areas of operation (e.g. polar, desert, jungle or sea) and training in the use of any survival equipment required to be carried.
 - (vii) A comprehensive drill to cover all ditching procedures where flotation equipment is carried. This should include practice of the actual donning and inflation of a life-jacket, together with a demonstration or audio-visual presentation of the inflation of life-rafts and/or slide-rafts and associated equipment. This practice should, on an initial conversion course, be conducted using the equipment in water, although previous certified training with another operator or the use of similar equipment will be accepted in lieu of further wet-drill training.
 - (viii) Instruction on the location of emergency and safety equipment, correct use of all appropriate drills, and procedures that could be required of flight crew in different emergency situations. Evacuation of the aircraft (or a representative training device) by use of a slide where fitted should be included when the operations manual procedure requires the early evacuation of flight crew to assist on the ground.

(d) Flight training

- (1) Flight training should be conducted to familiarise the flight crew member thoroughly with all aspects of limitations and normal, abnormal and emergency procedures associated with the aircraft and should be carried out by suitably qualified class and type rating instructors and/or examiners. For specific operations such as steep approaches, ETOPS, or operations based on QFE, additional training should be carried out, based on any additional elements of training defined for the aircraft type in the data in accordance with Regulation (EC) No 1702/2003, where they exist.
- (2) In planning flight training on aircraft with a flight crew of two or more, particular emphasis should be placed on the practice of LOFT with emphasis on CRM, and the use of crew coordination procedures, including coping with incapacitation.
- (3) Normally, the same training and practice in the flying of the aircraft should be given to co-pilots as well as commanders. The 'flight handling' sections of the syllabus for commanders and co-pilots alike should include all the requirements of the operator proficiency check required by ORO.FC.230.
- (4) Unless the type rating training programme has been carried out in an FSTD usable for ZFTT, the training should include at least three take-offs and landings in the aircraft.

(e) Line flying under supervision (LIFUS)

- (1) Following completion of flight training and checking as part of the operator's conversion course, each flight crew member should operate a minimum number of sectors and/or flight hours under the supervision of a flight crew member nominated by the operator.
 - (2) The minimum flight sectors/hours should be specified in the operations manual and should be determined by the following:
 - (i) previous experience of the flight crew member;
 - (ii) complexity of the aircraft; and
 - (iii) the type and area of operation.
 - (3) For performance class B aeroplanes, the amount of LIFUS required is dependent on the complexity of the operations to be performed.
- (f) Passenger handling for operations where no cabin crew is required
- Other than general training on dealing with people, emphasis should be placed on the following:
- (1) advice on the recognition and management of passengers who appear or are intoxicated with alcohol, under the influence of drugs or aggressive;
 - (2) methods used to motivate passengers and the crowd control necessary to expedite an aircraft evacuation; and
 - (3) the importance of correct seat allocation with reference to aircraft mass and balance. Particular emphasis should also be given on the seating of special categories of passengers.
- (g) Discipline and responsibilities, for operations where no cabin crew is required
- Emphasis should be placed on discipline and an individual's responsibilities in relation to:
- (1) his/her ongoing competence and fitness to operate as a crew member with special regard to flight and duty time limitation (FTL) requirements; and
 - (2) security procedures.
- (h) Passenger briefing/safety demonstrations, for operations where no cabin crew is required
- Training should be given in the preparation of passengers for normal and emergency situations.

AMC2 ORO.FC.220 Operator conversion training and checking

OPERATOR CONVERSION TRAINING SYLLABUS – FLIGHT ENGINEERS

- (a) Operator conversion training for flight engineers should approximate to that of pilots.
- (b) If the flight crew includes a pilot with the duties of a flight engineer, he/she should, after training and the initial check in these duties, operate a minimum number of flight sectors under the supervision of a nominated additional flight crew member. The minimum figures should be specified in the operations manual and should be selected after due note has been taken of the complexity of the aircraft and the experience of the flight crew member.

GM1 ORO.FC.220(b) Operator conversion training and checking

COMPLETION OF AN OPERATOR'S CONVERSION COURSE

- (a) The operator conversion course is deemed to have started when the flight training has begun. The theoretical element of the course may be undertaken ahead of the practical element.
- (b) Under certain circumstances the course may have started and reached a stage where, for unforeseen reasons, it is not possible to complete it without a delay. In these circumstances the operator may allow the pilot to revert to the original type.
- (c) Before the resumption of the operator conversion course, the operator should evaluate how much of the course needs to be repeated before continuing with the remainder of the course.

GM1 ORO.FC.220(d) Operator conversion training and checking

LINE FLYING UNDER SUPERVISION

- (a) Line flying under supervision provides the opportunity for a flight crew member to carry into practice the procedures and techniques he/she has been made familiar with during the ground and flight training of an operator conversion course. This is accomplished under the supervision of a flight crew member specifically nominated and trained for the task. At the end of line flying under supervision the respective crew member should be able to perform a safe and efficient flight conducted within the tasks of his/her crew member station.
- (b) A variety of reasonable combinations may exist with respect to:
 - (1) a flight crew member's previous experience;
 - (2) the complexity of the aircraft concerned; and
 - (3) the type of route/role/area operations.
- (c) Aeroplanes.

The following minimum figures for details to be flown under supervision are guidelines for operators to use when establishing their individual requirements:

- (1) turbo-jet aircraft
 - (i) co-pilot undertaking first operator conversion course:
 - (A) total accumulated 100 hours or minimum 40 flight sectors;
 - (ii) co-pilot upgrading to commander:
 - (A) minimum 20 flight sectors when converting to a new type;
 - (B) minimum 10 flight sectors when already qualified on the aeroplane type.

AMC1 ORO.FC.230 Recurrent training and checking

RECURRENT TRAINING SYLLABUS

- (a) Recurrent training

Recurrent training should comprise the following:

- (1) Ground training
 - (i) The ground training programme should include:

- (A) aircraft systems;
 - (B) operational procedures and requirements including ground de-icing/anti-icing and pilot incapacitation; and
 - (C) accident/incident and occurrence review.
- (ii) Knowledge of the ground training should be verified by a questionnaire or other suitable methods.
 - (iii) When the ground training is conducted within 3 calendar months prior to the expiry of the 12 calendar months period, the next ground and refresher training should be completed within 12 calendar months of the original expiry date of the previous training.
- (2) Emergency and safety equipment training
- (i) Emergency and safety equipment training may be combined with emergency and safety equipment checking and should be conducted in an aircraft or a suitable alternative training device.
 - (ii) Every year the emergency and safety equipment training programme should include the following:
 - (A) actual donning of a life-jacket, where fitted;
 - (B) actual donning of protective breathing equipment, where fitted;
 - (C) actual handling of fire extinguishers of the type used;
 - (D) instruction on the location and use of all emergency and safety equipment carried on the aircraft;
 - (E) instruction on the location and use of all types of exits;
 - (F) security procedures.
 - (iii) Every 3 years the programme of training should include the following:
 - (A) actual operation of all types of exits;
 - (B) demonstration of the method used to operate a slide where fitted;
 - (C) actual fire-fighting using equipment representative of that carried in the aircraft on an actual or simulated fire except that, with Halon extinguishers, an alternative extinguisher may be used;
 - (D) the effects of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment;
 - (E) actual handling of pyrotechnics, real or simulated, where applicable;
 - (F) demonstration in the use of the life-rafts where fitted. In the case of helicopters involved in extended over water operations, demonstration and use of the life-rafts.
- Helicopter water survival training
- Where life-rafts are fitted for helicopter extended overwater operations (such as sea pilot transfer, offshore operations, regular, or scheduled, coast-to-coast overwater operations), a comprehensive wet drill to cover all ditching procedures should be practised by aircraft crew. This wet drill should include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or audio-visual presentation of the inflation of life-

rafts. Crews should board the same (or similar) life-rafts from the water whilst wearing a life-jacket. Training should include the use of all survival equipment carried on board life-rafts and any additional survival equipment carried separately on board the aircraft;

- consideration should be given to the provision of further specialist training such as underwater escape training. Where operations are predominately conducted offshore, operators should conduct 3-yearly helicopter underwater escape training at an appropriate facility;
- wet practice drill should always be given in initial training unless the crew member concerned has received similar training provided by another operator;

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

- (iv) The successful resolution of aircraft emergencies requires interaction between flight crew and cabin/technical crew and emphasis should be placed on the importance of effective coordination and two-way communication between all crew members in various emergency situations.
- (v) Emergency and safety equipment training should include joint practice in aircraft evacuations so that all who are involved are aware of the duties other crew members should perform. When such practice is not possible, combined flight crew and cabin/technical crew training should include joint discussion of emergency scenarios.
- (vi) Emergency and safety equipment training should, as far as practicable, take place in conjunction with cabin/technical crew undergoing similar training with emphasis on coordinated procedures and two-way communication between the flight crew compartment and the cabin.

(3) CRM

- (i) Elements of CRM should be integrated into all appropriate phases of recurrent training.
- (ii) A specific modular CRM training programme should be established such that all major topics of CRM training are covered over a period not exceeding 3 years, as follows:
 - (A) human error and reliability, error chain, error prevention and detection;
 - (B) operator safety culture, standard operating procedures (SOPs), organisational factors;
 - (C) stress, stress management, fatigue and vigilance;
 - (D) information acquisition and processing, situation awareness, workload management;
 - (E) decision making;
 - (F) communication and coordination inside and outside the flight crew compartment;

- (G) leadership and team behaviour, synergy;
 - (H) automation and philosophy of the use of automation (if relevant to the type);
 - (I) specific type-related differences;
 - (J) case studies;
 - (K) additional areas which warrant extra attention, as identified by the safety management system.
- (iii) Operators should establish procedures to update their CRM recurrent training programme. Revision of the programme should be conducted over a period not exceeding 3 years. The revision of the programme should take into account the de-identified results of the CRM assessments of crews, and information identified by the safety management system.
- (4) Aircraft/FSTD training
- (i) General
 - (A) The aircraft/FSTD training programme should be established in a way that all major failures of aircraft systems and associated procedures will have been covered in the preceding 3 year period.
 - (B) When engine-out manoeuvres are carried out in an aircraft, the engine failure should be simulated.
 - (C) Aircraft/FSTD training may be combined with the operator proficiency check.
 - (D) When the aircraft/FSTD training is conducted within 3 calendar months prior to the expiry of the 12 calendar months period, the next aircraft/FSTD training should be completed within 12 calendar months of the original expiry date of the previous training.
 - (ii) Helicopters
 - (A) Where a suitable FSTD is available it should be used for the aircraft/FSTD training programme. If the operator is able to demonstrate, on the basis of a compliance and risk assessment, that using an aircraft for this training provides equivalent standards of training with safety levels similar to those achieved using an FSTD, the aircraft may be used for this training to the extent necessary.
 - (B) The recurrent training should include the following additional items, which should be completed in an FSTD:
 - settling with power and vortex ring;
 - loss of tail rotor effectiveness.
- (5) For operations with other-than-complex motor-powered aeroplanes, all training and checking should be relevant to the type of operation and class of aeroplane on which the flight crew member operates with due account taken of any specialised equipment used.

(b) Recurrent checking

Recurrent checking should comprise the following:

- (1) Operator proficiency checks
- (i) Aeroplanes

Where applicable, operator proficiency checks should include the following manoeuvres as pilot flying:

- (A) rejected take-off when an FSTD is available to represent that specific aeroplane, otherwise touch drills only;
- (B) take-off with engine failure between V_1 and V_2 (take-off safety speed) or, if carried out in an aeroplane, at a safe speed above V_2 ;
- (C) precision instrument approach to minima with, in the case of multi-engine aeroplanes, one-engine-inoperative;
- (D) non-precision approach to minima;
- (E) missed approach on instruments from minima with, in the case of multi-engined aeroplanes, one-engine-inoperative;
- (F) landing with one-engine-inoperative. For single-engine aeroplanes a practice forced landing is required.

(ii) Helicopters

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

- engine fire;
- fuselage fire;
- emergency operation of under carriage;
- fuel dumping;
- engine failure and relight;
- hydraulic failure;
- electrical failure;
- engine failure during take-off before decision point;
- engine failure during take-off after decision point;
- engine failure during landing before decision point;
- engine failure during landing after decision point;
- flight and engine control system malfunctions;
- recovery from unusual attitudes;
- landing with one or more engine(s) inoperative;
- instrument meteorological conditions (IMC) autorotation techniques;
- autorotation to a designated area;
- pilot incapacitation;
- directional control failures and malfunctions.

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

- precision instrument approach to minima;

- go-around on instruments from minima with, in the case of multi-engined helicopters, a simulated failure of one engine;
 - non-precision approach to minima;
 - in the case of multi-engined helicopters, a simulated failure of one engine to be included in either the precision or non-precision approach to minima;
 - landing with a simulated failure of one or more engines;
 - where appropriate to the helicopter type, approach with flight control system/flight director system malfunctions, flight instrument and navigation equipment failures.
- (C) Before a flight crew member without a valid instrument rating is allowed to operate in VMC at night, he/she should be required to undergo a proficiency check at night. Thereafter, each second proficiency check should be conducted at night.
- (iii) Once every 12 months the checks prescribed in (b)(1)(ii)(A) may be combined with the proficiency check for revalidation or renewal of the aircraft type rating.
 - (iv) Operator proficiency checks should be conducted by a type rating examiner (TRE) or a synthetic flight examiner (SFE), as applicable.
- (2) Emergency and safety equipment checks. The items to be checked should be those for which training has been carried out in accordance with (a)(2).
- (3) Line checks
- (i) Line checks should establish the ability to perform satisfactorily a complete line operation including pre-flight and post-flight procedures and use of the equipment provided, as specified in the operations manual. The route chosen should be such as to give adequate representation of the scope of a pilot's normal operations. When weather conditions preclude a manual landing, an automatic landing is acceptable. The commander, or any pilot who may be required to relieve the commander, should also demonstrate his/her ability to 'manage' the operation and take appropriate command decisions.
 - (ii) The flight crew should be assessed on their CRM skills in accordance with a methodology described in the operations manual. The purpose of such assessment is to:
 - (A) provide feedback to the crew collectively and individually and serve to identify retraining; and
 - (B) be used to improve the CRM training system.
 - (iii) CRM assessment alone should not be used as a reason for a failure of the line check.
 - (iv) When pilots are assigned duties as pilot flying and pilot monitoring they should be checked in both functions.
 - (v) Line checks should be conducted by a commander nominated by the operator. The operator should inform the competent authority about the persons nominated. The person conducting the line check, who is

described in (d)(5)(ii), should occupy an observer's seat where installed. His/her CRM assessments should solely be based on observations made during the initial briefing, cabin briefing, flight crew compartment briefing and those phases where he/she occupies the observer's seat.

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

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

- (4) When the operator proficiency check, line check or emergency and safety equipment check are undertaken within the final 3 calendar months of validity of a previous check, the period of validity of the subsequent check should be counted from the expiry date of the previous check.
- (5) In the case of single-pilot operations with helicopters, the recurrent checks referred to in (b)(1), (2) and (3) should be performed in the single-pilot role on a particular helicopter type in an environment representative of the operation.

(c) Flight crew incapacitation training, except single-pilot operations

- (1) Procedures should be established to train flight crew to recognise and handle flight crew incapacitation. This training should be conducted every year and can form part of other recurrent training. It should take the form of classroom instruction, discussion, audio-visual presentation or other similar means.
- (2) If an FSTD is available for the type of aircraft operated, practical training on flight crew incapacitation should be carried out at intervals not exceeding 3 years.

(d) Personnel providing training and checking

Training and checking should be provided by the following personnel:

- (1) ground and refresher training by suitably qualified personnel;
- (2) flight training by a flight instructor (FI), type rating instructor (TRI) or class rating instructor (CRI) or, in the case of the FSTD content, a synthetic flight instructor (SFI), providing that the FI, TRI, CRI or SFI satisfies the operator's experience and knowledge requirements sufficient to instruct on the items specified in paragraphs (a)(1)(i)(A) and (B);
- (3) emergency and safety equipment training by suitably qualified personnel;
- (4) CRM:
 - (i) integration of CRM elements into all the phases of the recurrent training by all the personnel conducting recurrent training. The operator should ensure that all personnel conducting recurrent training are suitably qualified to integrate elements of CRM into this training;
 - (ii) modular CRM training by at least one CRM trainer, who may be assisted by experts in order to address specific areas.

- (5) recurrent checking by the following personnel:
 - (i) operator proficiency check by a type rating examiner (TRE), class rating examiner (CRE) or, if the check is conducted in a FSTD, a TRE, CRE or a synthetic flight examiner (SFE), trained in CRM concepts and the assessment of CRM skills.
 - (ii) emergency and safety equipment checking by suitably qualified personnel.
- (e) Use of FSTD
 - (1) Training and checking provide an opportunity to practice abnormal/emergency procedures that rarely arise in normal operations and should be part of a structured programme of recurrent training. This should be carried out in an FSTD whenever possible.
 - (2) The line check should be performed in the aircraft. All other training and checking should be performed in an FSTD, or, if it is not reasonably practicable to gain access to such devices, in an aircraft of the same type or in the case of emergency and safety equipment training, in a representative training device. The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the aircraft type operated by the flight crew member.
 - (3) Because of the unacceptable risk when simulating emergencies such as engine failure, icing problems, certain types of engine(s) (e.g. during continued take-off or go-around, total hydraulic failure), or because of environmental considerations associated with some emergencies (e.g. fuel dumping) these emergencies should preferably be covered in an FSTD. If no FSTD is available these emergencies may be covered in the aircraft using a safe airborne simulation, bearing in mind the effect of any subsequent failure, and the exercise must be preceded by a comprehensive briefing.

AMC2 ORO.FC.230 Recurrent training and checking

FLIGHT ENGINEERS

- (a) The recurrent training and checking for flight engineers should meet the requirements for pilots and any additional specific duties, omitting those items that do not apply to flight engineers.
- (b) Recurrent training and checking for flight engineers should, whenever possible, take place concurrently with a pilot undergoing recurrent training and checking.
- (c) The line check should be conducted by a commander or by a flight engineer nominated by the operator, in accordance with national rules, if applicable.

GM1 ORO.FC.230 Recurrent training and checking

LINE CHECK AND PROFICIENCY TRAINING AND CHECKING

- (a) Line checks, route and aerodrome knowledge and recent experience requirements are intended to ensure the crew member's ability to operate efficiently under normal conditions, whereas other checks and emergency and safety equipment training are primarily intended to prepare the crew member for abnormal/emergency procedures.
- (b) The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards, and can provide the operator with a valuable indication of the usefulness of his/her training policy and methods. Line checks are a test of a flight crew member's ability to perform a

complete line operation, including pre-flight and post-flight procedures and use of the equipment provided, and an opportunity for an overall assessment of his/her ability to perform the duties required as specified in the operations manual. The line check is not intended to determine knowledge on any particular route.

(c) Proficiency training and checking

When an FSTD is used, the opportunity should be taken, where possible, to use LOFT.

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

SINGLE-ENGINE HELICOPTERS – AUTOROTATIVE LANDING

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

GM1 ORO.FC.235(f);(g) Pilot qualification to operate in either pilot's seat

DIFFERENCES BETWEEN LEFT AND RIGHT-HAND SEATS

The differences between left- and right-hand seats may not be significant in cases where, for example, the autopilot is used.

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

GENERAL

(a) Aeroplanes

- (1) When a flight crew member operates more than one aeroplane class, type or variant listed in Regulation (EU) No 1178/2011 and associated procedures for class-single pilot and/or type-single pilot, but not within a single licence endorsement, the operator should ensure that the flight crew member does not operate more than:
 - (i) three reciprocating engine aeroplane types or variants;
 - (ii) three turbo-propeller aeroplane types or variants;
 - (iii) one turbo-propeller aeroplane type or variant and one reciprocating engine aeroplane type or variant; or
 - (iv) one turbo-propeller aeroplane type or variant and any aeroplane within a particular class.
- (2) When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsement as defined by Regulation (EU) No 1178/2011 and associated procedures, the operator should ensure that:
 - (i) the minimum flight crew complement specified in the operations manual is the same for each type or variant to be operated;
 - (ii) the flight crew member does not operate more than two aeroplane types or variants for which a separate licence endorsement is required, unless credits related to the training, checking, and recent experience requirements are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants; and
 - (iii) only aeroplanes within one licence endorsement are flown in any one flight duty period, unless the operator has established procedures to ensure adequate time for preparation.

- (3) When a flight crew member operates more than one aeroplane type or variant listed in Regulation (EU) No 1178/2011 and associated procedures for type-single pilot and type-multi pilot, but not within a single licence endorsement, the operator should comply with points (a)(2) and (4).
- (4) When a flight crew member operates more than one aeroplane type or variant listed in Regulation (EU) No 1178/2011 and associated procedures for type multi-pilot, but not within a single licence endorsement, or combinations of aeroplane types or variants listed in Regulation (EU) No 1178/2011 and associated procedures for class single-pilot and type multi-pilot, the operator should comply with the following:
- (i) point (a)(2);
 - (ii) before exercising the privileges of more than one licence endorsement:
 - (A) flight crew members should have completed two consecutive operator proficiency checks and should have:
 - 500 hours in the relevant crew position in CAT operations with the same operator; or
 - for IFR and VFR night operations with performance class B aeroplanes, 100 hours or flight sectors in the relevant crew position in CAT operations with the same operator, if at least one licence endorsement is related to a class. A check flight should be completed before the pilot is released for duties as commander;
 - (B) in the case of a pilot having experience with an operator and exercising the privileges of more than one licence endorsement, and then being promoted to command with the same operator on one of those types, the required minimum experience as commander is 6 months and 300 hours, and the pilot should have completed two consecutive operator proficiency checks before again being eligible to exercise more than one licence endorsement;
 - (iii) before commencing training for and operation of another type or variant, flight crew members should have completed 3 months and 150 hours flying on the base aeroplane, which should include at least one proficiency check, unless credits related to the training, checking and recent experience requirements are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants;
 - (iv) after completion of the initial line check on the new type, 50 hours flying or 20 sectors should be achieved solely on aeroplanes of the new type rating, unless credits related to the training, checking and recent experience requirements are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants;
 - (v) recent experience requirements established in Regulation (EU) No 1178/2011 for each type operated;
 - (vi) the period within which line flying experience is required on each type should be specified in the operations manual;
 - (vii) when credits are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant type or variant, this should be reflected in the training required in ORO.FC.230 and:

- (A) ORO.FC.230 (b) requires two operator proficiency checks every year. When credits are defined in data established in accordance with Regulation (EC) No 1702/2003 for operator proficiency checks to alternate between the types, each operator proficiency check should revalidate the operator proficiency check for the other type(s). The operator proficiency check may be combined with the proficiency checks for revalidation or renewal of the aeroplane type rating or the instrument rating in accordance with Regulation (EU) No 1178/2011.
- (B) ORO.FC.230 (c) requires one line check every year. When credits are defined in data established in accordance for Regulation (EC) No 1702/2003 for line checks to alternate between types or variants, each line check should revalidate the line check for the other type or variant.
- (C) Annual emergency and safety equipment training and checking should cover all requirements for each type.

(b) Helicopters

- (1) If a flight crew member operates more than one type or variant the following provisions should be met:
 - (i) The recency requirements and the requirements for recurrent training and checking should be met and confirmed prior to CAT operations on any type, and the minimum number of flights on each type within a 3-month period specified in the operations manual.
 - (ii) ORO.FC.230 requirements with regard to recurrent training.
 - (iii) When credits related to the training, checking and recent experience requirements are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants, the requirements of ORO.FC.230 with regard to proficiency checks may be met by a 6 monthly check on any one type or variant operated. However, a proficiency check on each type or variant operated should be completed every 12 months.
 - (iv) For helicopters with a maximum certified take-off mass (MCTOM) of more than 5 700 kg, or with a maximum operational passenger seating configuration (MOPSC) of more than 19:
 - (A) the flight crew member should not fly more than two helicopter types, unless credits related to the training, checking and recent experience requirements are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants;
 - (B) a minimum of 3 months and 150 hours experience on the type or variant should be achieved before the flight crew member should commence the conversion course onto the new type or variant, unless credits related to the training, checking and recent experience requirements are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants;
 - (C) 28 days and/or 50 hours flying should then be achieved exclusively on the new type or variant, unless credits related to the training, checking and recent experience requirements are defined in data

- established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants; and
- (D) a flight crew member should not be rostered to fly more than one type or significantly different variant of a type during a single duty period.
- (v) In the case of all other helicopters, the flight crew member should not operate more than three helicopter types or significantly different variants, unless credits related to the training, checking and recent experience requirements are defined in data established in accordance with Regulation (EC) No 1702/2003 for the relevant types or variants.
- (c) Combination of helicopter and aeroplane
- (1) The flight crew member may fly one helicopter type or variant and one aeroplane type irrespective of their MCTOM or MOPSC.
 - (2) If the helicopter type is covered by paragraph (b)(1)(iv) then (b)(1)(iv)(B), (C) and (D) should also apply in this case.

AMC1 ORO.FC.A.245 Alternative training and qualification programme

COMPONENTS AND IMPLEMENTATION

- (a) Alternative training and qualification programme (ATQP) components

The ATQP should comprise the following:

- (1) Documentation that details the scope and requirements of the programme, including the following:
 - (i) The programme should demonstrate that the operator is able to improve the training and qualification standards of flight crew to a level that exceeds the standards prescribed in ORO.FC and Subpart E of Annex V (SPA.LVO).
 - (ii) The operator's training needs and established operational and training objectives.
 - (iii) A description of the process for designing and gaining approval for the operator's flight crew qualification programmes. This should include quantified operational and training objectives identified by the operator's internal monitoring programmes. External sources may also be used.
 - (iv) A description of how the programme will:
 - (A) enhance safety;
 - (B) improve training and qualification standards of flight crew;
 - (C) establish attainable training objectives;
 - (D) integrate CRM in all aspects of training;
 - (E) develop a support and feedback process to form a self-correcting training system;
 - (F) institute a system of progressive evaluations of all training to enable consistent and uniform monitoring of the training undertaken by flight crew;

- (G) enable the operator to be able to respond to new aeroplane technologies and changes in the operational environment;
 - (H) foster the use of innovative training methods and technology for flight crew instruction and the evaluation of training systems; and
 - (I) make efficient use of training resources, specifically to match the use of training media to the training needs.
- (2) A task analysis to determine the:
- (i) knowledge;
 - (ii) required skills;
 - (iii) associated skill-based training; and
 - (iv) validated behavioural markers, where appropriate.

For each aeroplane type/class to be included within the ATQP the operator should establish a systematic review that determines and defines the various tasks to be undertaken by the flight crew when operating that type/class. Data from other types/classes may also be used. The analysis should determine and describe the knowledge and skills required to complete the various tasks specific to the aeroplane type/class and/or type of operation. In addition, the analysis should identify the appropriate behavioural markers that should be exhibited. The task analysis should be suitably validated in accordance with (b)(3). The task analysis, in conjunction with the data gathering programme(s) permit the operator to establish a programme of targeted training together with the associated training objectives.

- (3) Curricula. The curriculum structure and content should be determined by task analysis, and should include proficiency objectives including when and how these objectives should be met.
- (i) The training programme should have the following structure:
- (A) Curriculum, specifying the following elements:
 - (a) Entry requirements: A list of topics and content, describing what training level will be required before start or continuation of training.
 - (b) Topics: A description of what will be trained during the lesson.
 - (c) Targets/Objectives
 - (1) Specific target or set of targets that have to be reached and fulfilled before the training course can be continued.
 - (2) Each specified target should have an associated objective that is identifiable both by the flight crew and the trainers.
 - (3) Each qualification event that is required by the programme should specify the training that is required to be undertaken and the required standard to be achieved.
 - (A) Daily lesson plan
 - (a) Each lesson/course/training or qualification event should have the same basic structure. The topics related to the lesson should be listed and the lesson targets should be unambiguous.

- (b) Each lesson/course or training event whether classroom, CBT or simulator should specify the required topics with the relevant targets to be achieved.
- (4) A specific training programme for:
- (i) each aeroplane type/class within the ATQP;
 - (ii) instructors (class rating instructor rating/synthetic flight instructor authorisation/type rating instructor rating — CRI/SFI/TRI), and other personnel undertaking flight crew instruction; and
 - (iii) examiners (class rating examiner/synthetic flight examiner/type rating examiner — CRE/SFE/TRE).

This should include a method for the standardisation of instructors and examiners.

Personnel who perform training and checking of flight crew in an operator's ATQP should receive the following additional training on:

- (A) ATQP principles and goals;
 - (B) knowledge/skills/behaviour as learned from task analysis;
 - (C) line oriented evaluation (LOE)/ LOFT scenarios to include triggers / markers / event sets / observable behaviour;
 - (D) qualification standards;
 - (E) harmonisation of assessment standards;
 - (F) behavioural markers and the systemic assessment of CRM;
 - (G) event sets and the corresponding desired knowledge/skills and behaviour of the flight crew;
 - (H) the processes that the operator has implemented to validate the training and qualification standards and the instructors part in the ATQP quality control; and
 - (I) line oriented quality evaluation (LOQE).
- (5) A feedback loop for the purpose of curriculum validation and refinement, and to ascertain that the programme meets its proficiency objectives.
- (i) The feedback should be used as a tool to validate that the curricula are implemented as specified by the ATQP; this enables substantiation of the curriculum, and that proficiency and training objectives have been met. The feedback loop should include data from operations flight data monitoring, the advanced flight data monitoring (FDM) programme and LOE/LOQE programmes. In addition, the evaluation process should describe whether the overall targets/objectives of training are being achieved and should prescribe any corrective action that needs to be undertaken.
 - (ii) The programme's established quality control mechanisms should at least review the following:
 - (A) procedures for approval of recurrent training;
 - (B) ATQP instructor training approvals;
 - (C) approval of event set(s) for LOE/LOFT;

- (D) procedures for conducting LOE and LOQE.
- (6) A method for the assessment of flight crew during conversion and recurrent training and checking. The assessment process should include event-based assessment as part of the LOE. The assessment method should comply with ORO.FC.230.
- (i) The qualification and checking programmes should include at least the following elements:
 - (A) a specified structure;
 - (B) elements to be tested/examined;
 - (C) targets and/or standards to be attained;
 - (D) the specified technical and procedural knowledge and skills, and behavioural markers to be exhibited.
 - (ii) An LOE event should comprise tasks and sub-tasks performed by the crew under a specified set of conditions. Each event has one or more specific training targets/objectives, which require the performance of a specific manoeuvre, the application of procedures, or the opportunity to practise cognitive, communication or other complex skills. For each event the proficiency that is required to be achieved should be established. Each event should include a range of circumstances under which the crews' performance is to be measured and evaluated. The conditions pertaining to each event should also be established and they may include the prevailing meteorological conditions (ceiling, visibility, wind, turbulence etc.), the operational environment (navigation aid inoperable etc.), and the operational contingencies (non-normal operation etc.).
 - (iii) The markers specified under the operator's ATQP should form one of the core elements in determining the required qualification standard. A typical set of markers is shown in the table below:

EVENT	MARKER
Awareness of Aeroplane Systems:	1. Monitors and reports changes in automation status
	2. Applies closed loop principle in all relevant situations
	3. Uses all channels for updates
	4. Is aware of remaining technical resources

- (iv) The topics / targets integrated into the curriculum should be measurable and progression on any training/course is only allowed if the targets are fulfilled.
- (7) A data monitoring/analysis programme consisting of the following:
 - (i) A flight data monitoring (FDM) programme as described in AMC1 ORO.AOC.130. Data collection should reach a minimum of 60 % of all

relevant flights conducted by the operator before ATQP approval is granted. This proportion may be increased as determined by the competent authority.

- (ii) An advanced FDM when an extension to the ATQP is requested: an advanced FDM programme is determined by the level of integration with other safety initiatives implemented by the operator, such as the operator's safety management system. The programme should include both systematic evaluations of data from an FDM programme and flight crew training events for the relevant crews. Data collection should reach a minimum of 80 % of all relevant flights and training conducted by the operator. This proportion may be varied as determined by the competent authority.

The purpose of an FDM or advanced FDM programme for ATQP is to enable the operator to:

- (A) provide data to support the programme's implementation and justify any changes to the ATQP;
- (B) establish operational and training objectives based upon an analysis of the operational environment; and
- (C) monitor the effectiveness of flight crew training and qualification.

- (iii) Data gathering: the data analysis should be made available to the person responsible for ATQP within the organisation. The data gathered should:
- (A) include all fleets that are planned to be operated under the ATQP;
 - (B) include all crews trained and qualified under the ATQP;
 - (C) be established during the implementation phase of ATQP; and
 - (D) continue throughout the life of the ATQP.
- (iv) Data handling: the operator should establish a procedure to ensure the confidentiality of individual flight crew members, as described by AMC1 ORO.AOC.130.
- (v) The operator that has a flight data monitoring programme prior to the proposed introduction of ATQP may use relevant data from other fleets not part of the proposed ATQP.

- (b) Implementation. The operator should develop an evaluation and implementation process including the following stages:

- (1) A safety case that demonstrates equivalency of:
- (i) the revised training and qualification standards compared to the standards of ORO.FC and/or Subpart E of Annex V (SPA.LVO) prior to the introduction of ATQP; and
 - (ii) any new training methods implemented as part of ATQP.

The safety case should encompass each phase of implementation of the programme and be applicable over the lifetime of the programme that is to be overseen. The safety case should:

- demonstrate the required level of safety;

- ensure the required safety is maintained throughout the lifetime of the programme; and
- minimise risk during all phases of the programme's implementation and operation.

The elements of a safety case include:

- planning: integrated and planned with the operation (ATQP) that is to be justified;
- criteria;
- safety-related documentation including a safety checklist;
- programme of implementation to include controls and validity checks; and
- oversight, including review and audits.

Criteria for the establishment of a safety case. The safety case should:

- be able to demonstrate that the required or equivalent level of safety is maintained throughout all phases of the programme;
- be valid to the application and the proposed operation;
- be adequately safe and ensure the required regulatory safety standards or approved equivalent safety standards are achieved;
- be applicable over the entire lifetime of the programme;
- demonstrate completeness and credibility of the programme;
- be fully documented;
- ensure integrity of the operation and the maintenance of the operations and training infrastructure;
- ensure robustness to system change;
- address the impact of technological advance, obsolescence and change; and
- address the impact of regulatory change.

- (2) A task analysis as required by (a)(2) to establish the operator's programme of targeted training and the associated training objectives.
- (3) A period of operation whilst data is collected and analysed to validate the safety case and task analysis. During this period the operator should continue to operate in accordance with ORO.FC and/or Subpart E of Annex V (SPA.LVO), as applicable. The length of this period should be determined by the competent authority.

GM1 ORO.FC.A.245 Alternative training and qualification programme

TERMINOLOGY

- (a) 'Line oriented evaluation (LOE)' is an evaluation methodology used in the ATQP to evaluate trainee performance, and to validate trainee proficiency. LOEs consist of flight simulator scenarios that are developed by the operator in accordance with a methodology approved as part of the ATQP. The LOE should be realistic and include appropriate weather scenarios and in addition should fall within an acceptable range of

difficulty. The LOE should include the use of validated event sets to provide the basis for event-based assessment.

- (b) 'Line oriented quality evaluation (LOQE)' is one of the tools used to help evaluate the overall performance of an operation. LOQEs consist of line flights that are observed by appropriately qualified operator personnel to provide feedback to validate the ATQP. The LOQE should be designed to look at those elements of the operation that are unable to be monitored by FDM or Advanced FDM programmes.
- (c) 'Skill-based training' requires the identification of specific knowledge and skills. The required knowledge and skills are identified within an ATQP as part of a task analysis and are used to provide targeted training.
- (d) 'Event-based assessment' is the assessment of flight crew to provide assurance that the required knowledge and skills have been acquired. This is achieved within an LOE. Feedback to the flight crew is an integral part of event-based assessment.
- (e) Safety case means a documented body of evidence that provides a demonstrable and valid justification that the ATQP is adequately safe for the given type of operation.

AMC1 ORO.FC.A.245(a) Alternative training and qualification programme

OPERATOR EXPERIENCE

The appropriate experience should be at least 2 years' continuous operation.

AMC1 ORO.FC.A.245(d)(e)(2) Alternative training and qualification programme

COMBINATION OF CHECKS

- (a) The line orientated evaluation (LOE) may be undertaken with other ATQP training.
- (b) The line check may be combined with a line oriented quality evaluation (LOQE).