



# **ANTR-FCL 4**

# **FLIGHT CREW LICENSING FLIGHT ENGINEERS**

**FOREWORD**

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## FOREWORD

- 1 The State of Bahrain Civil Aviation Affairs, known in these regulations as the “Authority” has implemented ANTR-FCL 4 based on the European Joint Aviation Requirements (JAR), with a view to harmonizing legislation.
  - 2 ICAO Annex 1 has been selected to provide the basic structure of ANTR-FCL, but with additional sub-division where considered appropriate.
  - 3 ANTR-FCL 1 contains regulations for Aeroplane pilots.  
ANTR-FCL 2 contains regulations for Helicopter pilots.  
ANTR-FCL 3 contains Medical regulations.  
ANTR-FCL 4 contains regulations for Flight Engineers
  - 4 The requirements ANTR-FCL 4 have been developed on the basis of ANTR-FCL 4 to facilitate comparison. For easy reference the same paragraph numbering for ANTR-FCL 1, 2 and 4 is used when addressing the same issue. Paragraphs that are not applicable for Flight Engineers are considered "intentionally left blank" and have been deleted without renumbering of the remaining paragraphs.
  - 5 The editing practices used in this document are as follows:
    - (a) ‘Shall’ is used to indicate a mandatory requirement and may appear in ANTRs.
    - (b) ‘Should’ is used to indicate a recommendation and normally appears in AMCs and IEMs.
    - (c) ‘May’ is used to indicate discretion by the Authority, the industry or the applicant, as appropriate.
    - (d) ‘Will’ indicates a mandatory requirement and is used to advise Flight Engineers of action incumbent on the Authority.
- NOTE: The use of the male gender implies the female gender and vice versa.*
- 6 The Authority has adopted associated compliance or interpretative material wherever possible and, unless specifically stated otherwise, clarification will be based on this material or other ANTR documentation.
  - 7 Definitions and abbreviations of terms used in ANTR-FCL that are specific to ANTR-FCL are given in ANTR-FCL 4.001 and IEM FCL 4.001.
  - 8 New, amended and corrected text will be enclosed within heavy brackets until a subsequent “amendment” is issued.
  - 9 Section 1 regulations are presented in Times Roman font and Section 2 material presented in Arial font.
  - 10 [This 3<sup>rd</sup> Edition Revision 1 is dated 01 March, 2011.]
  - 11 Please refer to the Volume 1 List of Effective Pages and Revision Page for current status.

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**SUBPART A****GENERAL REQUIREMENTS****ANTR-FCL 4.001 Definitions and Abbreviations**

(See IEM FCL 4.001)

Category (of aircraft):

Categorisation of aircraft according to specified basic characteristics, e.g. aeroplane, helicopter, glider, free balloon.

Conversion (of a licence):

The issue of an ANTR-FCL licence on the basis of a licence issued by an ICAO Contracting State.

Co-pilot:

“Co-pilot” means a pilot operating other than as pilot-in-command, an aircraft for which more than one pilot is required under the list of types of aeroplanes (see Appendix 1 to ANTR-FCL 1.220), or the type certification of the aircraft, or the operational regulations under which the flight is conducted, but excluding a pilot who is on board the aircraft for the sole purpose of receiving flight instruction for a licence or rating.

Dual instruction time:

Flight time or instrument ground time during which a person is receiving flight instruction from a properly authorised instructor.

Flight Engineer:

A Flight Engineer is a person who complies with the requirements in ANTR-FCL 4

Flight time:

The total time from the moment an airplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

Instrument time:

Instrument flight time or instrument ground time.

Instrument flight time:

Time during which a pilot is controlling an aircraft in flight solely by reference to instruments.

Instrument ground time:

Time during which a pilot is receiving instruction in simulated instrument flight in flight synthetic training devices (FSTDs).

Multi-crew co-operation:

The functioning of the flight crew as a team of co-operating members led by the pilot-in-command.

Multi-pilot aeroplanes:

Aeroplanes certificated for operation with a minimum crew of at least two pilots.

Night:

The period between the end of evening civil twilight and the beginning of morning civil twilight, or such other period between sunset and sunrise as may be prescribed by the appropriate Authority.

Other training devices:

Training aids other than flight simulators, flight training devices or flight and navigation procedures trainers which provide means for training where a complete flight deck environment is not necessary.

Private pilot:

A pilot who holds a licence which prohibits the piloting of aircraft in operations for which remuneration is given.

Professional pilot:

A pilot who holds a licence which permits the piloting of aircraft in operations for which remuneration is given.

Proficiency checks:

Demonstrations of skill to revalidate or renew ratings, and including such oral examination as the examiner may require.

Rating:

An entry in a licence stating special conditions, privileges or limitations pertaining to that licence.

Renewal (of e.g. a rating or approval):

The administrative action taken after a rating or approval has lapsed that renews the privileges of the rating or approval for a further specified period consequent upon the fulfilment of specified requirements.

Revalidation (of e.g. a rating or approval):

The administrative action taken within the period of validity of a rating or approval that allows the holder to continue to exercise the privileges of a rating or approval for a further specified period consequent upon the fulfilment of specified requirements.

Route sector:

A flight comprising take-off, departure, cruise of not less than 15 minutes, arrival, approach and landing phases.

Single-pilot aeroplanes:

Aeroplanes certificated for operation by one pilot.

Skill tests:

Skill tests are demonstrations of skill for licence or rating issue, including such oral examination as the examiner may require.

Solo flight time:

Flight time during which a student pilot is the sole occupant of an aircraft.

Student pilot-in-command (SPIC):

Flight time during which the flight instructor will only observe the student acting as pilot-in-command and shall not influence or control the flight of the aircraft.

Touring Motor Glider (TMG):

A motor glider having a certificate of airworthiness issued or accepted by the Authority having an integrally mounted, non-retractable engine and a non-retractable propeller plus those listed in Appendix 1 to ANTR-FCL 1.215. It shall be capable of taking off and climbing under its own power according to its flight manual.

Type (of aircraft):

All aircraft of the same basic design, including all modifications except those modifications which result in a change of handling, flight characteristics or flight crew complement.

For abbreviations see IEM FCL 4.001

#### **ANTR-FCL 4.005 Applicability**

(See Appendix 1 to ANTR-FCL 4.005)

(a) *General*

- (1) The requirements set out in ANTR-FCL for flight engineers shall apply to all arrangements made for training, testing and applications for the issue of licences, ratings, authorisations, approvals or certificates received by the Authority from 1 July 2007.
- (2) Whenever licences, ratings, authorisations, approvals or certificates are mentioned in ANTR-FCL, these are meant to be licences, ratings, authorisations, approvals or certificates issued in accordance with ANTR-FCL. In all other cases these documents are specified as ICAO licences.
- (3) Whenever a reference is made to JAA Member State for the purpose of mutual recognition of licences, ratings, authorisations, approvals or certificates, this means JAA full Member State.
- (4) All synthetic training devices mentioned in ANTR-FCL substituting an aircraft for training purposes are to be device qualified and in accordance with ANTR-FSTD A and user approved in accordance with ANTR-FCL by the Authority for the exercises to be conducted.

- (5) A licence issued on the basis of training performed outside of Bahrain, except training done according to ANTR-FCL 1.055(a)(1), shall have an entry to limit the privileges to aircraft registered in Bahrain.
  - (6) Rating(s) issued on the basis of training performed outside of Bahrain except training performed according to ANTR-FCL 1.055(a)(1), shall be limited to aircraft registered in Bahrain.
- (b) *Transitional arrangements*
- (1) Training for flight engineer's licences commenced prior to 1 July 2007 will be acceptable for the issue of licences or ratings, provided that training and testing is completed before 30 June 2010 for the applicable licence or rating.
  - (2) Licences and ratings, authorisations, approvals or medical certificates for flight engineer's licences issued before 1 July 2007 or issued in accordance with paragraph (1) above, shall continue to be valid with the same privileges, ratings and limitations, if any, provided that after 1 January 2008 all requirements for revalidation or renewal of such licences or ratings, authorisations, approvals or medical certificates shall be in accordance with the requirements of ANTR-FCL, except as specified in sub paragraph (4).
  - (3) Holders of a licence issued before 1 July 2007 or in accordance with (b)(1) above, may apply for the issue of the equivalent licence specified in ANTR-FCL 4. For the issue of such licences, the holder shall meet the requirements set out in Appendix 1 to ANTR-FCL 4.005.
- (c) *Continuation of examiners holding national authorisations.* Examiners holding authorisations prior to implementation date may be authorised as ANTR-FCL 4 (Flight Engineers) examiner provided that they have demonstrated a knowledge of ANTR-FCL and ANTR-OPS to the Authority. The authorisation will be for a maximum of 3 years. Thereafter re-authorisation will be subject to completion of the requirements set out in ANTR-FCL 4.425(a).

#### **ANTR-FCL 4.010 Basic authority to act as a flight crew member**

- (a) *Licence and rating.* A person shall not act as a flight crew member of a civil aeroplane registered in Bahrain unless that person holds a valid licence and rating complying with the requirements of ANTR-FCL and appropriate to the duties being performed, or an authorisation as set out in ANTR-FCL 4.230. The licence shall have been issued by:
- (1) the Authority; or
  - (2) another ICAO Contracting State and rendered valid in accordance with ANTR-FCL 4.015(b) or (c).
- (b) *Exercise of privileges.* The holder of a licence, rating, or authorisation shall not exercise privileges other than those granted by that licence, rating or authorisation.
- (c) *Appeals, Enforcement*
- (1) The Authority may at any time act on appeals, limit privileges, or suspend or revoke any licence, rating, authorisation, approval or certificate it has issued in accordance

with the requirements of ANTR-FCL if it is established that an applicant or a licence holder has not met, or no longer meets, the requirements of ANTR-FCL.

**ANTR-FCL 4.015 Acceptance of licences, ratings, authorisations, approvals or certificates**

(See Appendix 1 to ANTR-FCL 4.015)

(See AMC FCL 4.005 & 4.015)

(a) *Licences issued by ICAO Contracting States*

- (1) A licence issued by an ICAO Contracting State may be converted to a Bahraini licence, or rendered valid at the discretion of the Authority for use on aircraft registered in Bahrain in accordance with Appendix 1 to ANTR-FCL 4.015.
- (2) Validation of a flight engineer's licence shall not exceed one year from the date of validation, provided that the basic licence remains valid. Any further validation is subject to agreement by the Authority and to any conditions it sees fit to impose. The user of a licence validated by the Authority shall comply with the requirements stated in ANTR-FCL.
- (3) The requirements stated in (1) and (2) above shall not apply where aircraft registered in Bahrain are leased to a foreign operator, provided that the State of the operator has accepted for the period of lease the responsibility for the technical and/or operational supervision in accordance with ANTR-OPS 1.165. The licences of the flight crews of the foreign operator may be validated at the discretion of the Authority, provided that the privileges of the flight crew licence validation are restricted for use during the lease period only on nominated aircraft in specified operations not involving a Bahraini operator, directly or indirectly, through a wet lease or other commercial arrangement.

(b) *Reserved*

(c) *Conversion of a flight engineer licence issued by an ICAO Contracting State.*

A flight engineer licence issued by an ICAO Contracting State may be converted to a Bahraini licence provided that;

- (a) the foreign licence is acceptable to the Authority; and
  - (b) in addition, as from 01 January, 2015, by complying with the requirements shown in Appendix 1 to ANTR-FCL 4.015.
- (d) When the Authority issues a licence which deviates from ANTR-FCL, an endorsement shall be made on the licence, under item XIII.

**ANTR-FCL 4.016 Credit given to a holder of a foreign licence**

- (a) An applicant for a ANTR-FCL licence and IR, if applicable, already holding at least an equivalent licence issued in accordance with ICAO Annex 1 shall meet all the requirements of ANTR-FCL, except that the requirements of course duration, number of lessons and specific training hours may be reduced. The Authority may be guided as to the credits to be granted on the basis of a recommendation from an appropriate training organisation.

- (b) The holder of a F/EL issued in accordance with ICAO Annex 1 who meets the flying experience requirements of Appendix 1 to ANTR-FCL 4.015 may be exempted from the requirements to undergo approved training prior to undertaking the theoretical knowledge examinations and the skill test, if that licence contains a valid type rating for the aeroplane to be used for the F/EL skill test.

**ANTR-FCL 4.020 Credit for military service**

(See Appendix 1 to ANTR-FCL 4.005)

Application for credit:

Military flight crew members, having served or servicing in Bahrain and applying for licences or ratings specified in ANTR-FCL 4 shall apply to the Authority. The knowledge, experience and skill gained in military service will be credited towards the relevant requirements of ANTR-FCL 4 licences and ratings at the discretion of the Authority. The privileges of such licences shall be restricted to aircraft registered in the State of licence issue until the requirements set out in the Appendix 1 to ANTR-FCL 4.005 are met.

**ANTR-FCL 4.025 Validity of licences and ratings**

(See ANTR-FCL 3.105)

- (a) A licence holder shall not exercise the privileges granted by any licence or rating unless the holder maintains competency by meeting the relevant requirements of ANTR-FCL.
- (b) Validity of the licence and revalidation of a rating
- (1) The validity of the licence is determined by the validity of the ratings contained therein and the medical certificate (see ANTR-FCL 3.105).
  - (2) When issuing or revalidating/renewing a rating, the Authority may extend the validity period of the rating until the end of the month in which the validity would otherwise expire, that date remains the expiry date of the rating.
- (c) The licence will be issued for a maximum period of 5 years. Within this period of 5 years the licence will be re-issued by the Authority:
- (1) after initial issue or renewal of a rating;
  - (2) when paragraph XII in the licence is completed and no further spaces remain;
  - (3) for any administrative reason;
  - (4) at the discretion of the Authority when a rating is revalidated.

Valid ratings will be transferred to the new licence document by the Authority.

The licence holder shall apply to the Authority for the re-issue of the licence.

The application shall include the necessary documentation.



**ANTR-FCL 4.026 Recent experience for F/E**

A F/E shall not operate an aeroplane carrying passengers as F/E unless he has carried out at least one route sector in an aeroplane of the same type or a flight simulator of the aeroplane type to be used, in the preceding 90 days.

**ANTR-FCL 4.030 Arrangements for testing**

- (a) *Authorisation of examiners.* The Authority will designate and authorise as examiners suitably qualified persons of integrity to conduct on its behalf, skill tests and proficiency checks. The minimum qualifications for examiners are set out in ANTR-FCL 4 (Flight Engineers) Subpart I. Examiners' responsibilities and privileges will be notified to them individually in writing by the Authority.
- (b) *Number of examiners.* The Authority will determine the number of F/E examiners it requires, taking account of the number and geographic distribution of its flight engineer population.
- (c) *Notification of examiners.*
  - (1) The Authority will maintain a list of all examiners it has authorised stating for which roles they are authorised. The list will be made available to TRTOs, and FTOs within Bahrain. The Authority will determine by which means the examiners will be allocated to the skill test.
  - (2) The Authority will advise each applicant of the examiner(s) it has designated for the conduct of the skill test for the issue of a flight engineer licence.
- (d) Examiners shall not test applicants to whom flight instruction has been given by them for that licence except with the expressed consent in writing of the Authority.
- (e) *Pre-requisites for applicants undergoing a skill test.* Before a skill test for the issue of a licence or rating is taken the applicant shall have passed the associated theoretical knowledge examination. Instruction for the associated theoretical knowledge examination shall always have been completed before such skill tests are taken. The applicant for a skill test shall be recommended for the test by the organisation/person responsible for the training.

**ANTR-FCL 4.035 Medical fitness**

- (a) *Fitness.* The holder of a medical certificate shall be mentally and physically fit to exercise safely the privileges of the applicable licence.
- (b) *Requirement for medical certificate.* In order to apply for or to exercise the privileges of a licence, the applicant or the holder shall hold a medical certificate issued in accordance with the provisions of ANTR-FCL 3 (Medical) and appropriate to the privileges of the licence.
- (c) *Aeromedical disposition.* After completion of the examination the applicant shall be advised whether fit, unfit or referred to the Authority. The Authorised Medical Examiner (AME) shall inform the applicant of any condition(s) (medical, operational or otherwise) that may restrict flying training and/or the privileges of any licence issued.

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**ANTR-FCL 4.040 Decrease in medical fitness**

(See IEM FCL 3.040)

- (a) Holders of medical certificates shall not exercise the privileges of their licences, related ratings or authorisations at any time when they are aware of any decrease in their medical fitness which might render them unable to safely exercise those privileges.
- (b) Holders of medical certificates shall not take any prescription or non-prescription medication or drug, or undergo any other treatment, unless they are completely sure that the medication, drug or treatment will not have any adverse effect on their ability to perform safely their duties. If there is any doubt, advice shall be sought from the AMS, an AMC, or an AME. Further advice is given in ANTR-FCL 3 (see IEM FCL 3.040).
- (c) Holders of medical certificates shall, without undue delay, seek the advice of the AMS, an AMC or an AME when becoming aware of:
  - (1) hospital or clinic admission for more than 12 hours; or
  - (2) surgical operation or invasive procedure; or
  - (3) the regular use of medication; or
  - (4) the need for regular use of correcting lenses.
- (d) Holders of medical certificates who are aware of:
  - (1) any significant personal injury involving incapacity to function as a member of a flight crew; or
  - (2) any illness involving incapacity to function as a member of a flight crew throughout a period of 21 days or more; or
  - (3) being pregnant,  
  
shall inform the Authority in writing of such injury or pregnancy, and as soon as the period of 21 days has elapsed in the case of illness. The medical certificate shall be deemed to be suspended upon the occurrence of such injury or the elapse of such period of illness or the confirmation of the pregnancy, and:
  - (4) in the case of injury or illness the suspension shall be lifted upon the holder being medically examined under arrangements made by the Authority and being pronounced fit to function as a member of the flight crew, or upon the Authority exempting, subject to such conditions as it thinks fit, the holder from the requirement of a medical examination; and
  - (5) in the case of pregnancy, the suspension may be lifted by the Authority for such period and subject to such conditions as it thinks fit and shall cease upon the holder being medically examined under arrangements made by the Authority after the pregnancy has ended and being pronounced fit to resume her functions as a member of the flight crew.

**ANTR-FCL 4.045 Special circumstances**

- (a) It is recognised that the provisions of all parts of ANTR-FCL will not cover every possible situation. Where the application of ANTR-FCL would have anomalous consequences, or where the development of new training or testing concepts would not comply with the requirements, an applicant may ask the Authority concerned for an exemption. An exemption may be granted only if it can be shown that the exemption will ensure or lead to at least an equivalent level of safety.
- (b) The exemptions are divided into short term exemptions and long term exemptions (more than 6 months).

**ANTR-FCL 4.050 Crediting of flight time**

- (a) Unless otherwise specified in ANTR-FCL 4, flight time to be credited for a F/E licence or a TRI(E) rating shall have been flown as flight engineer in multi-pilot aeroplanes operated with a flight crew including a F/E.
- (b) Flight engineer under instruction or supervision: an applicant for a F/EL is credited in full with all simulator time under instruction of a TRI(E) provided that the training is performed in a multi-pilot environment.

**ANTR-FCL 4.055 Training organisations**

(See Appendix 1 to ANTR-FCL 4.055)

(See IEM FCL 4.055)

- (a) Flying training organisations (FTOs): see ANTR-FCL 1 (Aeroplane).
- (b) Type rating training organisations (TRTO's) wishing to offer training for type rating only shall be approved by the Authority. Requirements for approval of TRTO's are given in Appendix 1 to ANTR-FCL 4.055.
- (c) Organisations specialising in theoretical knowledge instruction located in Bahrain will be granted approval by the Authority subject to complying with those parts of Appendix 1 of ANTR-FCL 4.055 relevant to the specialised knowledge instruction they are providing.

**ANTR-FCL 4.070 Normal residency**

Normal residency means the place where a person usually lives for at least 185 days in each calendar year because of personal and occupational ties or, in the case of a person with no occupational ties, because of personal ties which show close links between that person and the place where she or he is living.

**ANTR-FCL 4.075 Format and specifications for flight crew licences**

(See Appendix 1 to ANTR-FCL 4.075)

The flight crew licence issued in accordance with ANTR-FCL 4 will conform to the following specifications.

- (a) *Content.* The item number shown will always be printed in association with the item heading. Items I to XI are the "permanent" items and items XII to XIV are the "variable" items which may appear on a separate or detachable part of the main form. Any separate or detachable part shall be clearly identifiable as part of the licence.

- (1) Permanent items
  - (I) State of licence issue.
  - (II) Title of licence.
  - (III) Serial number commencing with the postal code of the issuing state and followed by a code of numbers and/or letters in Arabic numerals and in Roman script.
  - (IV) Name of holder, (in Roman alphabet, if script of national language is other than Roman).
  - (V) Holder's address.
  - (VI) Nationality of holder.
  - (VII) Signature of holder.
  - (VIII) Authority and, where necessary, conditions under which the licence was issued.
  - (IX) Certification of validity and authorisation for the privileges granted.
  - (X) Signature of the officer issuing the licence and the date of issue.
  - (XI) Seal or stamp of the Authority.
- (2) Variable items
  - (XII) Ratings - type, instructor, etc., with dates of expiry. Radio telephony (R/T) privileges may appear on the licence form or on a separate certificate.
  - (XIII) Remarks i.e. special endorsements relating to limitations and endorsements for privileges.
  - (XIV) Any other details required by the Authority.
- (b) *Material.* The paper or other material used will prevent or readily show any alterations or erasures. Any entries or deletions to the form will be clearly authorised by the Authority.
- (c) *Colour.* White material will be used for flight engineer licences issued in accordance with ANTR-FCL 4.
- (d) *Language.* Licences shall be written in the English language and such other languages as the Authority deems appropriate.

**ANTR-FCL 4.080 Recording of flight time**

Details of all flights flown as a flight engineer shall be kept in a reliable record in a logbook format acceptable to the Authority.

**Appendix 1 to ANTR-FCL 4.005****Minimum requirements for the issue of a ANTR-FCL licence/authorisation**

(See ANTR-FCL 4.005(b)(3))

(See AMC FCL 4.005 &amp; 4.015)

**1 Flight Engineer licences**

A flight engineer licence previously issued by the Authority may be replaced by a ANTR-FCL 4 licence subject, where applicable, to conditions. For the replacement of such licences the holder shall:

- (a) complete, as a proficiency check, the type rating revalidation requirements of ANTR-FCL 4.245 relevant to the privileges of the licence held;
- (b) demonstrate to the satisfaction of the Authority that a knowledge of the relevant parts of ANTR-OPS and ANTR-FCL (see AMC FCL 4.005 & 4.015) has been acquired;
- (c) demonstrate a knowledge of English in accordance with ANTR-FCL 4.160
- (d) comply with the experience requirements and any further requirements as set out in the table below :

Licence held	Total flying experience as flight engineer	Any further requirements	Replacement ANTR-FCL licence	Removal of conditions
(1)	(2)	(3)	(4)	(5)
Flight Engineer	>1 500 as flight engineer on aeroplanes	none	F/EL	Not applicable

**2. Instructor ratings**

Rating, authorisation or privileges held	Experience	Any further requirements	Replacement ANTR-FCL rating
(1)	(2)	(3)	(4)
TRI(E)	As required under ANTR-FCL 4 (Flight Engineers) for the relevant rating	Demonstrate to the satisfaction of the Authority a knowledge of the relevant parts of ANTR-FCL 4 (Flight Engineers) and ANTR-OPS as set out in AMC FCL 4.005 & 4.015.	TRI(E) *

**3 SFI(E) authorisation**

A SFI(E) authorisation may be replaced by a ANTR-FCL 4 (Flight Engineers) authorisation provided that the holder complies with the experience requirements and any further requirements as set out in the table below:

Authorisation held	Experience	Any further requirements	Replacement ANTR-FCL authorisation
(1)	(2)	(3)	(4)
SFI(E)	>1 500 hrs as flight engineer on aeroplanes	(i) hold or have held a flight engineer licence acceptable to the Authority. (ii) have completed the flight simulator content of the applicable type rating course including MCC.	SFI(E)
SFI(E)	3 years recent experience as a SFI(E) acceptable to the Authority	have completed the flight simulator content of the applicable type rating course including MCC.	SFI(E)

This authorisation will be for a maximum period of 3 years.

Further re-authorisation will be subject to completion of the requirements set out in ANTR-FCL 4.415.

**Appendix 1 to ANTR-FCL 4.015****Minimum requirements for the validation of flight engineer licences**

(See ANTR-FCL 4.015)

(See AMC FCL 4.005 &amp; 4.015)

- 1 The minimum requirements for the validation of a flight engineer licence are specified below.
- 2 A flight engineer licence issued in accordance with ICAO Annex 1 may be validated subject to conditions in order to permit flights (other than flight instruction) in aeroplanes registered in Bahrain. To validate such licences, the holder shall:
  - (a) complete, as a skill test, the type rating revalidation requirements of ANTR-FCL 4.245 relevant to the privileges of the licence held. A skill test or proficiency check previously conducted to JAR-FCL 4.245, or to a standard acceptable to the Authority, and valid at the time of application would meet this requirement.
  - (b) demonstrate to the satisfaction of the Authority that a knowledge of the relevant parts of ANTR-OPS and ANTR-FCL (see AMC FCL 4.005 & 4.015) has been acquired;
  - (c) demonstrate a knowledge of English in accordance with ANTR-FCL 4.160(d);
  - (d) [hold a valid ANTR-FCL Class 2 medical certificate;]
  - (e) meet any published additional requirements that the Authority deems necessary; and
  - (f) as from 01 January, 2015, comply with the experience requirements set out in column (2) of the following table in relation to the validation conditions specified in column (3):

Licence held	Total flying experience as flight engineer	Validation conditions	
(1)	(2)	(3)	
Flight engineer	>1 500 hours as flight engineer on aeroplanes in commercial air transport	Commercial air transport in aeroplanes as flight engineer	(a)
Flight engineer	>1 000 hours as flight engineer on aeroplanes in other than commercial air transport	Other than commercial air transport in aeroplanes as flight engineer	(b)



**Appendix 1 to ANTR-FCL 4.055****Type Rating Training Organisations for the issue of type ratings only**

(See ANTR-FCL 4.055(b) and (c))

(See ANTR-FCL 4.261(c) for approval of courses)

(See IEM FCL 4.055)

**INTRODUCTION**

- 1 A type rating training organisation (TRTO) is an organisation staffed, equipped and operated in a suitable environment offering type rating training, and/or MCC-training, and/or synthetic flight instruction and, if applicable, theoretical instruction for specific training programmes.
- 2 A TRTO wishing to offer approved training to meet ANTR-FCL requirements shall obtain the approval of the Authority. No such approval will be granted by the Authority unless:
  - (a) the Authority can enforce the ANTR-FCL requirements; and
  - (b) the TRTO meets all requirements of ANTR-FCL

This Appendix gives the requirements for the issue, revalidation and variation of the approval of a TRTO.

**OBTAINING APPROVAL**

- 3 A TRTO seeking approval shall provide to the Authority operations and training manuals, including quality systems, and descriptions of its training schemes as required by paragraph 17 and 25 through 27. After consideration of the application, the TRTO will be inspected to ensure that it meets the requirements set out in this Appendix. Subject to satisfactory inspection, approval of the TRTO will initially be granted for a period of one year. Revalidation of the approval may be granted for further periods of up to three years. The Authority is not obliged to grant an approval for a TRTO outside Bahrain if the personnel resources are not available or the cost of processing the application for approval and inspections puts undue burden on the Authority.
- 4 All training courses shall be approved (see IEM FCL 4.055 (to be developed)).
- 5 Approval will be varied, suspended or revoked by the Authority if any of the approval requirements or standards cease to be maintained to the minimum approved level.
- 6 If a TRTO wishes to make changes to an approved course or to its operations or training manual the approval of the Authority shall be obtained before the changes are implemented. TRTOs need not advise the Authority of minor changes in day-to-day operations. Where any doubt exists as to whether a proposed change is minor, the Authority shall be consulted.
- 7 A TRTO may make training arrangements with other training organisations or make use of alternative base aerodromes as part of its overall training organisation, subject to the approval of the Authority.

**FINANCIAL RESOURCES**

- 8 (a) A TRTO shall satisfy the Authority that sufficient funding is available to conduct training to the approved standards.
  - (b) A TRTO shall nominate a person acceptable to the Authority who shall satisfy the Authority that sufficient funding is available to conduct training to the approved standard. Such person shall be known as the accountable manager.

## INSPECTION

- 9 In addition to the initial inspection, the Authority will make certain inspections to determine the TRTO's compliance with ANTRs and the approval.
- 10 During such visits, access shall be given by the TRTO to training records, authorisation sheets, technical logs, lectures, study notes and briefings and any other relevant material. A copy of any report on a visit to a TRTO will be made available to that TRTO.

## MANAGEMENT AND STAFFING

- 11 The management structure shall allow supervision of all grades of staff by persons having the experience and qualities necessary to ensure the maintenance of high standards. Details of the management structure, indicating individual responsibilities, shall be included in the TRTO's Operations Manual.
- 12 A Head of Training (HT) acceptable to the Authority shall be nominated. The HT's responsibilities shall include ensuring that the TRTO is in compliance with ANTR-FCL requirements. This person is ultimately directly responsible to the Authority.
- 13 The TRTO shall have adequate personnel necessary to accomplish the training objectives. The duties of each instructor shall be identified and documented.

## FLIGHT ENGINEER INSTRUCTOR

- 14 Flight Engineer Instructors shall hold:
  - (a) a flight engineer licence and rating(s) related to the flying training courses they are appointed to conduct; or
  - (b) an authorisation from the Authority to conduct specific training in a TRTO (see ANTR-FCL 4.300).

## INSTRUCTORS FOR SYNTHETIC FLIGHT TRAINING

- 15 For flight training duties, instructors shall hold or have held a flight engineer licence and have instructional experience appropriate to the training courses they are appointed to conduct. For multi crew type rating and/or MCC flight training on a flight simulator and/or FTD, instructors shall hold a Flight Engineer Instructor rating or a SFI(E) authorisation.

## THEORETICAL KNOWLEDGE INSTRUCTION

- 16 The theoretical knowledge instruction shall be conducted by an authorised instructor holding the appropriate type rating or any instructor having appropriate experience in aviation and knowledge of the aircraft concerned, e.g. flight engineer, maintenance engineer, flight operations officer.

## TRAINING STANDARDS

- 17 The TRTO shall establish a system to ensure that the training centre operations and training are run efficiently and effectively. The quality system shall determine the effectiveness of TRTO policies, procedures, and training.

## RECORDS

- 18 A TRTO shall maintain the following records and retain for a period of at least 5 years, using appropriate administrative staff:
- (a) F/E trainee's assessments before and during the course;
  - (b) details of theoretical knowledge, flying, and simulated flight training given to individual trainees; and
  - (c) personal information, (expiry dates of medical certificates, ratings, etc.) related to TRTO's personnel.
- 19 The format of the trainee's training records shall be specified in the Training Manual.
- 20 The TRTO shall submit training records and reports as required by the Authority.

## TRAINING PROGRAMME

- 21 A training programme shall be developed for each type of course offered. This programme shall include a breakdown of flying and ground training in either a week-by-week or phase presentation, a list of standard exercises and a syllabus summary. In particular, synthetic flight training and theoretical knowledge instruction shall be phased in such a manner as to ensure that trainees shall be able to apply to flying exercises the knowledge gained on the ground. Arrangements should be made so that problems encountered in instruction can be resolved during subsequent flight training.

Flight training for type rating for multi-pilot aeroplanes operated with a flight crew including a F/E shall be conducted with a flight crew of three using the MCC concept. The type rating course of a flight engineer shall be conducted by a flight engineer instructor.

## TRAINING AEROPLANES

- 22 Each aeroplane must be equipped as required in the training specifications concerning the approved course in which it is used.

## FACILITIES

- 23 Suitable training facilities shall be provided.

## REQUIREMENTS FOR ENTRY TO TRAINING

- 24 The TRTOs shall be responsible for ensuring that trainees meet at least the pre-requisite conditions for type rating training as set out in ANTR-FCL 4.250.

## TRAINING MANUAL AND OPERATIONS MANUAL

- 25 A TRTO shall provide and maintain a Training Manual and an Operations Manual containing information and instructions to enable staff to perform their duties and to give guidance to trainees on how to comply with course requirements. A TRTO shall make available to staff and, where appropriate, to trainees the information contained in the Training Manual, the Operations Manual and the TRTO's approval documentation. The amendment procedure shall be stated and amendments properly controlled.

- 26 The Training Manual shall state the standards, objectives and training goal for each phase of training that the trainees are required to comply with, including stating the entry requirements for each course, as applicable.

It shall contain the information set out in IEM FCL 4.055, as applicable.

- 27 The Operations Manual shall provide relevant information to particular groups of staff, e.g. TRI(E), synthetic flight instructors, ground instructors, operations and maintenance staff, etc. and shall contain the information set out in IEM FCL 4.055, as applicable.

**Appendix 1 to ANTR-FCL 4.075**  
**Specifications for flight crew licences**  
(See ANTR-FCL 4.075)

GENERAL

- 1 A valid licence including a valid medical certificate has always to be carried by the flight engineer when exercising the privileges of the licence.
- 2 A document containing a photo shall be carried for purposes of identification of the holder of the licence.
- 3 Any medical endorsements (e.g. use of spectacles, etc.) will be entered on the medical certificate (see ANTR-FCL 3 IEM FCL 3.100) and at the discretion of the Authority on the licence.

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**SUBPART D****FLIGHT ENGINEER LICENCE - F/EL****ANTR-FCL 4.135 Student flight engineer**

A student flight engineer shall meet the requirements specified by the Authority.

**ANTR-FCL 4.140 Minimum age**

An applicant for a F/EL shall be at least 18 years of age.

**ANTR-FCL 4.145 Medical fitness**

[An applicant for a F/EL shall hold a valid Class 2 medical certificate. In order to exercise the privileges of the F/EL a valid Class 2 medical certificate shall be held.]

**ANTR-FCL 4.150 Privileges and conditions**

- (a) *Privileges.* Subject to any other conditions specified in ANTRs, the privileges of the holder of a F/EL are to act as a flight engineer in any multi-pilot aeroplane operated with a flight crew including a F/E.
- (b) *Conditions.* An applicant for a F/EL who has complied with the conditions specified in ANTR-FCL 4.140, 4.145 and 4.160 through 4.170 shall have fulfilled the requirements for the issue of a F/EL containing the type rating for the aeroplane used in the skill test.
- (c) *Restricted period.*
  - (1) the privileges of the F/EL will be restricted until he has achieved 100 hours of flying experience as a F/E under the direct supervision of a TRI(E).
  - (2) from the 100 hours of flying experience, 50 hours may be credited in a flight simulator as F/E under restriction by a TRI(E) of which up to 25 hours may be substituted as pilot.

**ANTR-FCL 4.160 Theoretical and practical knowledge and skill**

(See Appendix 1, 2 and 3 to ANTR-FCL 4.160)

An applicant for a F/EL shall:

- (a)
  - (1) hold a theoretical ATP(A) in accordance with ANTR-FCL 1.285; or
  - (2) have passed an ICAO ATP(A) theory test, including RT privileges or hold a R/T certificate/licence;
- (b)
  - (1) have completed an approved technical training course of the maintenance of JAR 25/FAR 25/CS 25, BCAR, or AIR 2051 aeroplanes as in Appendix 1 to ANTR-FCL 4.160; or
  - (2) have a university level of education in aeronautical engineering and have practical experience acceptable to the Authority in the maintenance of JAR 25/FAR 25, CS 25 BCAR, or AIR 2051 aeroplanes; or

- (3) hold an Aircraft Maintenance Licence class B1/B2/C according to Part 66 or equivalent national licence/approval.
- (c) have completed a "flight appreciation course" (see Appendix 2 to ANTR-FCL 4.160);
- (d) have demonstrated the ability to use the English language as set out in Appendix 3 to ANTR-FCL 4.160.

**ANTR-FCL 4.165 Flight instruction and experience**

- (a) An applicant for a restricted F/EL shall have completed an approved course of flying training for a type rating on a multi-pilot aeroplane operated with a flight crew including a F/E at an approved Type Rating Training Organisation.
- (b) An applicant who holds or has held an ICAO professional aeroplane pilot licence with IR or has equivalent experience as a military pilot is credited with the "flight appreciation course" as in ANTR-FCL 4.160(c).

**ANTR-FCL 4.170 Skill**

(See Appendix 1 and 2 to ANTR-FCL 4.240)

An applicant for a F/EL shall have demonstrated the ability to perform as a flight engineer in an aeroplane the procedures and manoeuvres described in Appendices 1 and 2 to ANTR-FCL 4.240.



**Appendix 1 to ANTR-FCL 4.160**  
**Technical Training Course (TTC)**  
 (See ANTR-FCL 4.160(b)(1))

**INTRODUCTION**

- 1 The TTC shall be undertaken by an applicant for a F/EL with no previous experience in the maintenance of JAR 25/FAR 25, CS 25, BCAR or AIR 2051 aeroplanes.
- 2 The aim of the TTC is:
  - to familiarise the applicant with the basic maintenance procedures;
  - to give additional technical background knowledge, especially with respect to the implication of systems malfunctions;
  - to train the applicant to oversee maintenance procedures in daily and routine operations of maintenance related to the MEL.

**INSTRUCTORS**

- 3 Instructors for a TTC shall be acceptable to the Authority.

**THEORETICAL KNOWLEDGE INSTRUCTION**

- 4 The theoretical knowledge instruction shall be given in an approved FTO or Part 147 Training Organisation.
- 5 The theoretical knowledge instruction consists of 100 hours in addition to the following parts of the ATPL(A) syllabus in ANTR-FCL 1:
 

1	Airframe and Systems	21 01
2	Electrics	21 02
3	Powerplant and Emergency Equipment	21 03/04
4	Flight Instruments and Automatic Flight Control Systems	22 01/02

**PRACTICAL SKILLS**

- 6 The practical part of a TTC shall be given in a training centre of an approved Part 145 maintenance organisation.
- 7 The practical training need not to be related to a single aeroplane type.
- 8 The applicant shall work together with experienced maintenance staff in the following departments:
 

1	Fuselage and Flight Controls	5 days
2	Engines	5 days
3	Instruments	5 days

4	Landing Gear and Brakes	5 days
5	Cabin/Cockpit/Emergency Equipment	5 days
6	Ground Handling and Servicing	5 days

## CERTIFICATE OF COMPLETION

- 9 Following successful completion of the technical training, the Training Organisation carrying out the theoretical knowledge instruction and/or the practical skill training, shall provide the applicant with a certificate of satisfactory completion of the course, or part thereof.

**Appendix 2 to ANTR-FCL 4.160****Flight Appreciation Course**

(See ANTR-FCL 4.160(c))

## INTRODUCTION

- 1 The flight appreciation course shall be undertaken by any applicant for a F/EL with no previous IR experience as professional or military pilot.
- 2 The aim of the flight appreciation course is to familiarize the applicant with basic piloting skills and the use of instruments and navigation aids to comply with IFR procedures during departure, intermediate and final approach to landing phases of flight.

## PROVISION OF COURSES

- 3 The flight appreciation course shall be undertaken at an FTO approved in accordance with ANTR-FCL Appendix 1 to 1.055 or at a TRTO approved in accordance with ANTR-FCL Appendix 1 to 4.055.
- 4 The course shall be acceptable to the Authority.
- 5 The course shall be undertaken on a flight simulator, an FNPT II or an aeroplane equipped for IR flying. The procedural flying element of the course may be undertaken on a FNPT II.
- 6 The course may be combined with the Type Rating course required for the final issue of a F/EL.

## INSTRUCTORS

- 7 Instructors for the flight appreciation course shall be the holders of:
  - a) a FI(A) rating if conducted in an aeroplane;
  - b) a SFI(A) authorisation or a TRI(A) rating if conducted in a simulator;
  - c) a FI(A) rating or SFI(A) authorisation if conducted in a FNPT II.

## TRAINING PROGRAM

- 8 A training programme shall be developed as appropriate to the type of aeroplane, simulator or FNPT II to be used for the course. The training programme shall be acceptable to the Authority.
- 9 The training programme shall include not less than 8 hours of flight instruction on an aeroplane or simulator or FNPT II, and not less than 10 hours of briefing and ground instruction. The flight instruction shall include:
  - a) aircraft handling in clean, approach and landing configuration;
  - b) aircraft trim and the effects of configuration/power changes,
  - c) approach to the stall and recovery from incipient stage of stall warning;
  - d) basic instrument flying on full panel;

- e) use of autopilot
- f) use of flight director, if available;
- g) tracking of VOR/NDB radials;
- h) approach and go-around;
- i) situation awareness

#### LEVEL OF PROFICIENCY

- 10 The instructor shall ensure that the applicant has achieved a satisfactory understanding of basic aeroplane handling, and the use of flight instruments and navigation aids.
- 11 At the completion of the course, the instructor shall provide the applicant with a record of the ground briefing or instruction giving the flight time and exercises undertaken and a statement to the effect that the aim of the course has been achieved. The record shall be retained by the applicant for submission to the Authority at the time of license application.

**Appendix 3 to ANTR-FCL 4.160****Use of English language**

(See ANTR-FCL 4.160)

- 1 An applicant for a F/EL must as a crew member in a multi-pilot operated aeroplane:
  - (a) be able to monitor the communication in English during all phases of flight between the aeroplane and ground stations, including weather information.
  - (b) be able to read and demonstrate an understanding of technical manuals written in English, e.g. Operation Manual, Aeroplane Flight Manual etc.
  - (c) be able to communicate with other crew members in English during all phases of flight relevant to the function on board, including flight preparation.
  
- 2 This shall be demonstrated by complying with one of the following alternative requirements:
  - (a) having graduated from an I/R or ATP course given in English, or the course according to Appendix 1 to ANTR-FCL 4.160 given in English; or
  - (b) having passed:
    - an IR; or
    - ATPL skill test or proficiency check; or
    - the skill test or proficiency check in accordance with ANTR-FCL 4.170 during which the two-way radiotelephony communication is performed in English; or
  - (c) having passed a specific examination on behalf of the Authority after having undertaken a course of training enabling the applicant to meet the objectives listed in 1(a), (b) and (c).

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**SUBPART F****TYPE RATINGS (FLIGHT ENGINEERS)****ANTR-FCL 4.220 Type ratings (F/E)**

(See Appendix 1 to ANTR-FCL 4.220)

*Listing.* Type ratings for aeroplanes will be issued according to the list of types of aeroplanes (see Appendix 1 to ANTR-FCL 4.220). Type ratings may also be issued for multi-pilot aeroplanes operated with a flight crew including a F/E. In order to change to another variant of the aeroplane within one type rating, differences or familiarisation training is required (see Appendix 1 to ANTR-FCL 4.220).

**ANTR-FCL 4.225 Circumstances in which type ratings are required**

The holder of a flight engineer licence shall not act in any capacity as a flight engineer of an aeroplane except as a flight engineer undergoing skill testing or receiving flight instruction unless the holder has a valid and appropriate type rating. When a type rating is issued limiting the privileges, or to any conditions agreed within the Authority, such limitation shall be endorsed on the rating.

**ANTR-FCL 4.230 Special authorisation of type ratings**

For the non-revenue special purpose flights e.g. aircraft flight testing, special authorisation may be provided in writing to the licence holder by the Authority in place of issuing the type rating in accordance with ANTR-FCL 4.225. This authorisation shall be limited in validity to completing a specific task.

**ANTR-FCL 4.235 Type ratings - Privileges, number and variants**

(See Appendix 1 to ANTR-FCL 4.220)

- (a) *Privileges.* Subject to ANTR-FCL 4.220 above, the privileges of the holder of a type rating are to act as a flight engineer on the type of aeroplane specified in the rating.
- (b) *Number of type ratings held.* There is no ANTR-FCL limit to the number of ratings that may be held at one time. ANTR-OPS, however, may restrict the number of ratings that can be exercised at any one time.
- (c) *Variants.* If the variant has not been flown within a period of 2 years following the differences training, further differences training or a proficiency check in that variant will be required.
  - (1) Differences training requires additional knowledge and training on an appropriate training device or the aeroplane:

The differences training shall be entered in the flight engineer's logbook or equivalent document and signed by a TRI(E) or SFI(E) as appropriate.
  - (2) Familiarisation training requires the acquisition of additional knowledge.

**ANTR-FCL 4.240 Type ratings - Requirements**

(See Appendices 1 and 2 to ANTR-FCL 4.240)

(See IEM FCL 4.240(b))

- (a) *General*

- (1) An applicant for a type rating for a multi-pilot type of aeroplane operated by a flight crew including a F/E shall comply with the requirements for type ratings set out in ANTR-FCL 4.250, 4.261 and 4.262.
  - (2) The type rating course, including theoretical knowledge, shall be completed within the 6 months preceding the skill test.
  - (3) At the discretion of the Authority, an aeroplane type rating may be issued to an applicant who meets the requirements for that rating of another State, provided ANTR-FCL 4.250 is met. Such a rating will be restricted to aeroplanes registered in that State, or operated by an operator of that State. The restriction may be removed when the holder has completed at least 500 hours of flight as a F/E on the type and complied with the revalidation requirements of ANTR-FCL 4.245.
  - (4) A type rating contained in a licence issued by another State may be transferred to a ANTR-FCL licence, subject to the appropriate proficiency check, provided the applicant is in current flying practice and has not less than 500 hours flying experience as a flight engineer on that type, provided ANTR-FCL 4.250 is met.
- (b) *Skill test*
- (1) The skill test contents and sections for a F/E type rating on multi-pilot aeroplanes requiring a minimum crew of three are set out in Appendices 1 and 2 to ANTR-FCL 4.240; and
  - (2) Each applicable item in the appropriate skill test shall be satisfactorily completed within the six months immediately preceding the date of receipt of the application for the rating.

#### **ANTR-FCL 4.245 Type ratings - Validity, revalidation and renewal**

(See Appendices 1 and 2 to ANTR-FCL 4.240)

- (a) *Type ratings, aeroplane – Validity.* Type ratings for aeroplanes are valid for one year from the date of issue, or the date of expiry if revalidated within the validity period.
- (b) *Type ratings, aeroplane – Revalidation.* For revalidation of type ratings aeroplane, the applicant shall complete:
  - (1) a proficiency check in accordance with Appendix 1 to ANTR-FCL 4.240 in the relevant type of aeroplane within the three months immediately preceding the expiry date of the rating; and
  - (2) at least ten route sectors as flight engineer of the relevant type of aeroplane, or one route sector as flight engineer of the relevant type of aeroplane flown with a TRE(E) during the period of validity of the rating.
- (c) An applicant who fails to achieve a pass in all sections of a proficiency check before the expiry date of a type rating shall not exercise the privileges of that rating until the proficiency check has successfully been completed.
- (d) Extension of the validity period or revalidation of ratings in special circumstances:
  - (1) When the privileges of an aircraft type rating are being exercised solely on an aeroplane registered in another State, the Authority may at its discretion extend the



validity period of the rating, or revalidate the rating provided the requirements of that State are fulfilled.

- (2) When the privileges of an aircraft type rating are being exercised in a Bahraini registered aeroplane being operated by an operator of another State under the provisions of Article 83bis of the International Convention on Civil Aviation, Chicago, the Authority may at its discretion extend the validity period of the rating, or revalidate the rating provided the requirements of that other State are fulfilled.
  - (3) Any rating extended or revalidated under the provisions of (1) or (2) above shall be revalidated in accordance with ANTR-FCL 4.245(b) before the privileges are exercised on aircraft registered in and operated by a Bahraini operator
  - (4) A rating issued or used in another State may remain in a ANTR-FCL licence at the discretion of the Authority provided the requirements of that State are fulfilled and the rating is restricted to aircraft registered in that State.
- (e) *Expired Ratings.* If a type rating has expired, the applicant shall meet any refresher training requirements as determined by the Authority and complete a proficiency check in accordance with Appendix 1 to ANTR-FCL 4.240. The rating will be valid from the date of completion of the renewal requirements.

#### **ANTR-FCL 4.250 Type ratings – Multi-Crew Co-operation (MCC)**

An applicant for the first issue of a type rating shall hold a certificate of satisfactory completion of multi-crew co-operation course (MCC) (see ANTR-FCL 4.261). If the MCC course is to be added to the type rating course, this requirement is not applicable.

#### **ANTR-FCL 4.261 Type ratings - Knowledge and flight instruction**

(See Appendix 2 to ANTR-FCL 4.240)

(See Appendix 1 to ANTR-FCL 4.261)

(See AMC FCL 4.261)

- (a) *Theoretical knowledge instruction and checking requirements.* An applicant for a type rating for multi-pilot aeroplanes operated with a flight crew including a F/E shall have completed the required theoretical knowledge instruction (see Appendix 1 to ANTR-FCL 4.261(a)) and demonstrated the level of knowledge required for the safe operation of the applicable aeroplane type.
- (b) *Flight instruction.* An applicant for a type rating for multi-pilot aeroplanes operated with a flight crew including a F/E shall have completed a course of flight instruction related to the type rating skill test (see Appendix 2 to ANTR-FCL 4.240).
- (c) *Conduct of training courses*
  - (1) Training courses for the above purpose shall be conducted by a TRTO. Training courses may also be conducted by a facility or a sub-contracted facility provided by an operator or a manufacturer.
  - (2) Such courses shall be approved by the Authority and such facilities shall meet the relevant requirements of Appendix 1 to ANTR-FCL 4.055, as determined by the Authority.

- (d) *Multi-crew co-operation training.* The MCC training should be combined with the initial type rating course. The MCC training shall comprise at least 25 hours of theoretical knowledge instruction and exercises, and 4 hours of simulator training in addition to the type rating course (see AMC FCL 4.261).

**ANTR-FCL 4.262 Type ratings – Skill**

(See Appendix 1 and 2 to ANTR-FCL 4.240)

*Flight engineer skill test.* An applicant for a type rating for a multi-pilot aeroplane operated with a flight crew including a F/E shall have demonstrated the skill required for the safe operation of the applicable type of aeroplane in a multi-crew environment as a F/E as set out in Appendices 1 and 2 to ANTR-FCL 4.240.

**Appendix 1 to ANTR-FCL 4.220****List of Type of aeroplane**

(See ANTR-FCL 4.220(c))

- 1 This Appendix includes aeroplanes type certificated in JAA Member States and does not include:
  - (a) aeroplanes not type certificated in accordance with FAR/JAR/CS 23, FAR/JAR/CS 23 Commuter Category, FAR/JAR/CS 25, BCAR or AIR 2051;
  - (b) aeroplanes type certificated in the State of Bahrain under special registration such as military, ex-military, experimental or vintage aeroplanes;

Aeroplanes not listed may be entered into a ANTR-FCL licence, but the rating privileges are restricted to aeroplanes on the register of the State of rating issue.

- 2 Explanation of table (refer to ANTR-FCL 4.235(c)):
  - (a) the symbol (D) in column 3 indicates that differences training is required when moving between variants or other types of aeroplane which are separated by the use of a line in column 2;
  - (b) although the licence endorsement (column 4) contains all aeroplanes listed in column 2, the required familiarisation or differences training has still to be completed;
  - (c) the specific variant on which the skill test for the type rating has been completed will be recorded according to ANTR-FCL 4.080 (to be developed).

## List of AEROPLANE Types Requiring a Flight Engineer \*

1 Manufacturer	2 A/C Certification	3	4 Licence Endorsement
Aerospatiale/BAC	Concorde		Concorde
Aero Spaceline	377 SGTf Super Guppy		Super Guppy
Airbus	A300 - B1 - B2 series - B4 series - C4-200 series - F4-200 series		A300
	A300 - 300-600ST (Beluga)		A300-600ST
Boeing	B707 - 100 series - 300 series - 400 series		B707
	B727 -100 series -200 series		B727
	B747 - 100 series - 200 series - 300 series	(D)	B747 100-300-S.P.
	- S.P.		
Boeing/McDonnell-Douglas	Douglas-3A-S1C3G		DC3
	DC4		DC4
	DC6 series		DC6
	DC7C		DC7
	DC8-33 DC8-50, 60, 70 series		DC8
	DC10 series		DC10
Lockheed	L382 G		Hercules
	L188 Electra series A	(D)	L188 Electra
	L188 Electra series C		
	L1011 series		L1011
Short Brothers	SC5 Belfast		Belfast

\* Multi-pilot aeroplanes may be operated with a F/E as an additional member of the flight crew.

**Appendix 1 to ANTR-FCL 4.240****Skill test and proficiency check for aeroplane type ratings**

(See ANTR-FCL 4.240 through 4.262)

- 1 The applicant shall have completed the required instruction in accordance with the syllabus given in Appendix 2 to ANTR-FCL 4.240. The administrative arrangements for confirming the applicant's suitability to take the test, including disclosure of the applicant's training record to the examiner, shall be determined by the Authority.
- 2 Items to be covered in skill tests/proficiency checks are given in the applicable Appendix 2 to ANTR-FCL 4.240. With the approval of the Authority, several different skill test/proficiency check scenarios may be developed containing simulated line operations. The examiner will select one of these scenarios. Flight simulators, if available and other training devices as approved shall be used.
- 3 The applicant shall pass all sections of the skill test/proficiency check. If any item in a section is failed, that section is failed. Failure in more than one section will require the applicant to take the entire test/check again. Any applicant failing only one section shall take the failed section again. Failure in any section of the re-test/re-check including those sections that have been passed at a previous attempt will require the applicant to take the entire test/check again.
- 4 Further training may be required after a failed test/check. Failure to achieve a valid pass in all sections in two attempts shall require further training as determined by the examiner. There is no limit to the number of skill tests/proficiency checks that may be attempted.

**CONDUCT OF THE TEST/CHECK - GENERAL**

- 5 The Authority will provide the examiner with safety criteria to be observed in the conduct of the test/check.
- 6 Should an applicant choose not to continue with a test/check for reasons considered inadequate by the examiner, the applicant will be regarded as having failed those items not attempted. If the test/check is terminated for reasons considered adequate by the examiner, only those items not completed shall be tested in a further flight.
- 7 At the discretion of the examiner any manoeuvre or procedure of the test/check may be repeated once by the applicant. The examiner may stop the test/check at any stage if it is considered that the applicant's competency requires a complete re-test/re-check.
- 8 Checks and procedures shall be carried out/completed in accordance with the authorised check list for the aeroplane used in the test/check and, if applicable, with the MCC concept. Performance data for take-off, approach and landing shall be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane used.

**SPECIAL REQUIREMENTS FOR THE SKILL TEST/PROFICIENCY CHECK**

- 9 The test/check shall be performed in a multi-crew environment.
- 10 The test/check should be accomplished as far as possible in a simulated commercial air transport environment under IFR. An essential element is the ability to plan and conduct the flight from routine briefing material.

## FLIGHT TEST TOLERANCE

- 11 The applicant shall demonstrate the ability to:
- (a) operate the aeroplane systems within its limitations;
  - (b) exercise good judgement and airmanship;
  - (c) apply aeronautical knowledge;
  - (d) understand and apply crew co-ordination and incapacitation procedures, if applicable; and
  - (e) communicate effectively with the other crew members.

## CONTENT OF THE SKILL TEST/PROFICIENCY CHECK

- 12 (a) The skill test and proficiency check contents and sections are set out in Appendix 2 to ANTR-FCL 4.240. The format and application form to the skill test may be determined by the Authority.
- (b) The skill test shall be completed with a flight crew including a F/E using the MCC concept.
- (c) When the type rating course includes not more than 2 hours flight training on the aeroplane, the skill test may be simulator only and may be completed before the flight training on the aeroplane. In that case, a certificate of completion of the type rating course including the flight training on the aeroplane shall be forwarded to the Authority before the new type rating is entered in the applicant's licence.

**Appendix 2 to ANTR-FCL 4.240****Content of the F/E Type rating/Training/Skill Test and proficiency check on multi-pilot aeroplanes requiring a minimum crew of three**

(See ANTR-FCL 4.240 through 4.262 and 4.295)

1 The following symbols mean:

F/E = Trained for the issue of a type rating as applicable.

X = Flight Simulators shall be used for this exercise, if available, otherwise an aeroplane shall be used if appropriate for the manoeuvre or procedure.

N/A = Not applicable for flight engineers.

F/E# = The training shall be complimented by supervised aeroplane inspection

2 The practical training shall be conducted at least at the training equipment level shown as F/E, or may be conducted up to any higher equipment level shown by the arrow (----->)

The following abbreviations are used to indicate the training equipment used:

A = Aeroplane

FS = Flight Simulator

FTD = Flight Training Device

OTD = Other Training Devices

3 Where the letter “M” appears in the skill test/ proficiency check column this will indicate a mandatory exercise.

4 A flight simulator shall be used for practical training and testing if the simulator forms part of an approved type-rating course. The following considerations will apply to the approval of the course:

(a) the qualification of the flight simulator or FNTP II as set out in ANTR-FSTD A;

(b) the qualifications of the instructor and examiner;

(c) the amount of line-orientated training provided on the course;

(d) the qualifications and previous line operating experience of the engineer under training;  
and

(e) the amount of supervised line flying experience provided after the issue of the new type rating.

Manoeuvres/Procedures (including Multi-Crew Cooperation)	PRACTICAL TRAINING				Instructors initials when training completed	F/E/L/TYPE-RATING SKILL TEST/PROF. CHECK	
	OTD	FTD	FS	A		Chkd in FS A	Examiner's initials when test completed
<b>SECTION 1</b>							
<b>1. Flight preparation</b>							
1.1 Performance calculation	F/E						
1.2 Aeroplane ext. visual inspect.; location of each item and purpose of inspection	F/E#			F/E		M if aircraft is used	
1.3 Cockpit inspection		F/E----->	----->	----->		M	
1.4 Use of checklist prior to starting engines, starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies.	F/E----->	----->	----->	----->		M	
1.5 Taxiing in compliance with air traffic control or instructions of instructor.			F/E----->	----->			
1.6 Before take-off checks		F/E----->	----->	----->		M	
<b>SECTION 2</b>							
<b>2. Take-offs</b>							
2.1 Normal take offs with different flap settings, including expedited take off.			F/E----->	----->			
2.2 Instrument take-off; transition to instrument flight is required during rotation or immediately after becoming airborne.			F/E----->	----->	N/A	N/A	N/A
2.3 Cross wind take-off (A, if practicable)			F/E----->	----->	N/A	N/A	N/A
2.4 Take-off at maximum take-off mass (actual or simulated maximum take-off mass)			F/E----->	----->			
2.5 Take-offs with simulated engine failure			F/E----->	----->		M	
2.5.1 shortly after reaching $V_2$ , or							
2.5.2 between $V_1$ and $V_2$ , or			F/E	X		M FS Only	
2.6 Rejected take-off at a reasonable speed before reaching $V_1$			F/E----->	X		M	



Manoeuvres/Procedures (including Multi-Crew Cooperation)	PRACTICAL TRAINING				Instructors initials when training completed	F/EL/TYPE-RATING SKILL TEST/PROF. CHECK	
	OTD	FTD	FS	A		Chkd in FS A	Examiner's initials when test completed
<b>SECTION 3</b>							
<b>3. Flight Manoeuvres and Procedures</b>			F/E----->	----->			
3.1 Turns with and without spoilers.			F/E----->	----->			
3.2 Tuck under and Mach buffets after reaching the critical Mach number, and other specific flight characteristics of the aeroplane (e.g. Dutch Roll)			F/E----->	X An aircraft may not be used for this exercise			
3.3 Normal operation of systems and controls engineer's panel.	F/E----->	----->	----->	----->		M	
3.4 Normal and abnormal operations of following systems:						A mandatory minimum of 3 abnormal shall be selected from 3.4.0 to 3.4.14 inclusive. M	
3.4.0 Engine (if necessary propeller)	F/E----->	----->	----->	----->			
3.4.1 Pressurisation and air-conditioning	F/E----->	----->	----->	----->			
3.4.2 Pitot/static system	F/E----->	----->	----->	----->			
3.4.3 Fuel system	F/E----->	----->	----->	----->			
3.4.4 Electrical system	F/E----->	----->	----->	----->			
3.4.5 Hydraulic system	F/E----->	----->	----->	----->			
3.4.6 Flight control and Trim-system	F/E----->	----->	----->	----->			
3.4.7 Anti- and de-icing system, Glare shield heating	F/E----->	----->	----->	----->			
3.4.8 Autopilot/Flight director	F/E----->	----->	----->	----->			
3.4.9 Stall warning devices or stall avoidance devices, and stability augmentation devices.	F/E----->	----->	----->	----->			
3.4.10 Ground proximity warning system, weather radar, radio altimeter, transponder.		F/E----->	----->	----->			
3.4.11 Radios, navigation equipment, instruments, flight management system.	F/E----->	----->	----->	----->			
3.4.12 Landing gear and brake-system.	F/E----->	----->	----->	----->			
3.4.13 Slat and flap system.	F/E----->	----->	----->	----->			
3.4.14 Auxiliary power unit.	F/E----->	----->	----->	----->			
<b>3.5 Intentionally left blank</b>							

Manoeuvres/Procedures (including Multi-Crew Cooperation)	PRACTICAL TRAINING					F/EL/TYPE-RATING SKILL TEST/PROF. CHECK	
	OTD	FTD	FS	A	Instructors initials when training completed	Chkd in FS A	Examiner's initials when test completed
<b>3.6 Abnormal and emergency procedures:</b>						A mandatory minimum of 3 items shall be selected from 3.6.1 to 3.6.9 inclusive. M	
3.6.1 Fire drills e.g. Engine, APU, cabin, cargo compartment, flight deck, wing and electrical fires including evacuation.		F/E----->	----->	----->			
3.6.2 Smoke control and removal .		F/E----->	----->	----->			
3.6.3 Engine failures, shut-down and restart at a safe height.		F/E----->	----->	----->			
3.6.4 Fuel dumping (simulated).		F/E----->	----->	----->		FS only	
3.6.5 Windshear at Take off/landing.			F/E	X		FS only	
3.6.6 Simulated cabin pressure failure/Emergency descent.			F/E----->	----->			
3.6.7 Incapacitation of flight crew member.		F/E----->	----->	----->			
3.6.8 Other emergency procedures as outlined in the appropriate aeroplane Flight Manual.		F/E----->	----->	----->			
<b>3.6.9 ACAS event</b>	F/E--->	----->	----->			FS only	
3.7 Steep turns with 45° bank, 180° to 360° left and right.		F/E----->	----->	----->	N/A	N/A	N/A
3.8 Early recognition and counter measures on approaching stall (up to activation of stall warning device) in take-off configuration, (flaps in take-off position), in cruising flight configuration and in landing configuration (flaps in landing position, gear extended)			F/E----->	----->			
3.8.1 Recovery from full stall or after activation of stall warning device in climb, cruise and approach configuration.			F/E----->	X			
<b>3.9 Instrument flight procedures.</b>							
3.9.1 Adherence to departure and arrival routes and ATC instructions.		F/E----->	----->	----->			
3.9.2 Holding procedures.		F/E----->	----->	----->	N/A	N/A	N/A
3.9.3 Precision approaches down to a decision height (DH) not less than 60 m (200 ft)			F/E----->	----->			
3.9.3.1 manually, without flight director.			F/E----->	----->		N/A	N/A
3.9.3.2 manually, with flight director.			F/E----->	----->		N/A	N/A
3.9.3.3 with autopilot.			F/E----->	----->			

Manoeuvres/Procedures (including Multi-Crew Cooperation)	PRACTICAL TRAINING				Instructors initials when training completed	F/EL/TYPE-RATING SKILL TEST/PROF. CHECK	
	OTD	FTD	FS	A		Chkd in FS A	Examiner's initials when test completed
3.9.3.4 manually, with one engine simulated in-operative;					N/A	N/A	N/A
engine failure has to be simulated during final approach from before passing the outer marker (OM) until touchdown or through the complete missed approach procedure.			F/E----->	----->		M	
3.9.4 non-precision approach down to the MDH/A			F/E----->	----->			
3.9.5 Circling approach under following conditions:  a) approach to the authorised minimum circling approach altitude at the aerodrome in question in accordance with the local instrument approach facilities in simulated instrument flight conditions;  followed by:  b) circling approach to another runway at least 90° off centreline from final approach used in item a), at the authorised minimum circling approach altitude;  Remark: if a) and b) are not possible due to ATC reasons a simulated low visibility pattern may be performed.			F/E----->	----->			

Manoeuvres/Procedures (including Multi-Crew Cooperation)	PRACTICAL TRAINING				Instructors initials when training completed	F/EL/TYPE-RATING SKILL TEST/PROF. CHECK	
	OTD	FTD	FS	A		Chkd in FS A	Examiner's initials when test completed
<b>SECTION 4</b>							
<b>4. Missed Approach Procedures</b>			F/E ----->	----->			
4.1 Go-around with all engines operating after an ILS approach on reaching decision height.			>				
4.2 Other missed approach procedures.			F/E----->	----->			
4.3 Manual go-around with engine simulated inoperative after an instrument approach on reaching DH, MDH or MAPt			F/E----->	----->		M	
4.4 Rejected landing at 15 m (50ft) above runway threshold and go-around.			F/E----->	----->			
<b>SECTION 5</b>							
<b>5. Landings</b>							
5.1 Normal landings also after an ILS approach with transition to visual flight on reaching DH.			F/E----->	----->			
5.2 Landing with simulated jammed horizontal stabiliser in any out-of-trim position.			F/E----->	X an aircraft may not be used for this exercise			
5.3 Cross wind landings (A, if practicable).			F/E----->	----->	N/A	N/A	N/A
5.4 Traffic pattern and landing without extended or with partly extended flaps and slats.			F/E----->	----->			
5.5 Landing with critical engine simulated inoperative.			F/E----->	----->		M	
5.6 Landing with two engines simulated inoperative:  - Aeroplanes with three engines: the centre engine and one outboard engine as far as practicable according to data of the AFM.  - Aeroplanes with four engines: two engines at one side.			F/E	X		M FS only (skill test only)	

General remarks:

Special requirements for extension of a type rating for instrument approaches down to a decision height of less than 200 feet (60m), i.e. Cat II/III operations. (Refer to Subpart E, ANTR-FCL 1.180)

Manoeuvres/Procedures (including Multi-Crew Cooperation)	PRACTICAL TRAINING				Instructors initials when training completed	F/EL/TYPERATING SKILL TEST/PROF. CHECK	
	OTD	FTD	FS	A		Chkd in FS A	Examiner's initials when test completed
<b>SECTION 6</b>							
<b>6.Additionnal authorisation for instrument approaches down to a decision height of less than 60 m (200 ft) (CAT II/III)</b>  The following manoeuvres and procedures are the minimum training requirements to permit instrument approaches down to a DH of less than 60 m (200 ft).  During the following instrument approaches and missed approach procedures all aeroplane equipment required for type certification of instrument approaches down to a DH of less than 60 m (200 ft) shall be used.							
6.1 Rejected take-off at minimum authorised RVR.			F/E----->	X an aircraft may not be used for this exercise		M	
6.2 ILS Approaches  in simulated instrument flight conditions down to the applicable DH using flight guidance system. Standard procedures of crew coordination (task sharing, call out procedures, mutual surveillance, information, and support) shall be observed.			F/E----->	----->		M	
6.3 Go-around  after approaches as indicated in 6.2 on reaching DH. The training also shall include go-around due to (simulated) insufficient RVR, wind shear, aeroplane deviation in excess of approach limits for a successful approach, and ground/airborne equipment failure prior to reaching DH and, go-around with simulated airborne equipment failure. Special attention shall be given to go-around procedures with pre-calculated manual or automatic go-around attitude guidance.			F/E----->	----->		M	

Manoeuvres/Procedures (including Multi-Crew Cooperation)	PRACTICAL TRAINING				Instructors initials when training completed	F/EL/TYPE-RATING SKILL TEST/PROF. CHECK	
	OTD	FTD	FS	A		Chkd in FS A	Examiner's initials when test completed
6.4 Landing(s).  with visual reference established at decision height following an instrument approach. Depending on the specific flight guidance system, an automatic landing shall be performed.			F/E----->	----->		M	

*Note: CAT II/III operations shall be accomplished in accordance with Operational Rules.*

**Appendix 1 to ANTR-FCL 4.261(a)****Theoretical knowledge instruction and checking requirements for type ratings**

(See ANTR-FCL 4.261(a))

- 1 The theoretical knowledge instruction shall be conducted by an authorised instructor holding the appropriate type rating or any instructor having appropriate experience in aviation and knowledge of the aircraft concerned, e.g. flight engineer, maintenance engineer, flight operations officer.
- 2 The theoretical knowledge instruction shall cover the syllabus in AMC FCL 4.261(a), as appropriate to the aeroplane type concerned with the following content:
  - (a) Aeroplane structure and equipment, normal operation of systems and malfunctions
    - Dimensions
    - Engine including auxiliary power unit
    - Fuel system
    - Pressurisation and air-conditioning
    - Ice protection, windshield wipers and rain repellent
    - Hydraulic systems
    - Landing gear
    - Flight controls, lift devices
    - Electrical power supply
    - Flight instruments, communication, radar and navigation equipment
    - Cockpit, cabin and cargo compartment
    - Emergency equipment
  - (b) Limitations
    - General limitations
    - Engine limitations
    - System limitations
    - Minimum equipment list
  - (c) Performance, flight planning and monitoring
    - Performance
    - Flight planning
    - Flight monitoring
  - (d) Load, balance and servicing
    - Load and balance
    - Servicing on ground
  - (e) Emergency procedures
  - (f) Special requirements for extension of a type rating for instrument approaches down to a decision height of less than 200 ft (60 m)
    - Airborne equipment, procedures and limitations
  - (g) Special requirements for “glass cockpit” aeroplanes
    - Electronic flight instrument systems (e.g. EFIS, EICAS)
  - (h) Flight management systems (FMS)
- 3 For the initial issue of type ratings the written or computer based examination shall at least comprise one hundred multi-choice questions distributed appropriately across the main

subjects of the syllabus. The pass mark shall be 75% in each of the main subjects of the syllabus.

- 4 For proficiency checks theoretical knowledge shall be verified by a multi-choice questionnaire or other suitable methods.



**Appendix 1 to ANTR-FCL 4.261(d)**  
**Multi-crew co-operation course (Aeroplane)**  
(See ANTR-FCL 4.261(d))  
(See AMC FCL 4.261(d))

- 1 The aim of the course is to become proficient in multi-crew co-operation (MCC) in order to operate safely multi-pilot multi-engine aeroplanes under IFR and, for that purpose, to ensure that:
  - a. The pilot-in-command fulfils his managing and decision-making functions irrespective whether he is PF or PNF.
  - b. The tasks of PF and PNF and F/E are clearly specified and distributed in such a manner that the PF can direct his full attention to the handling and control of the aircraft.
  - c. Co-operation is effected in an orderly manner appropriate to the normal, abnormal or emergency situations encountered.
  - d. Mutual supervision, information and support is ensured at all times.

#### INSTRUCTORS

- 2 Instructors for MCC training shall be thoroughly familiar with human factors and crew resource management (CRM). They should be current with the latest developments in human factors training and CRM techniques.

#### THEORETICAL KNOWLEDGE

- 3 The theoretical knowledge syllabus is set out in AMC FCL 4.261(d). An approved MCC theoretical knowledge course shall comprise not less than 25 hours.

#### FLYING TRAINING

- 4 The flying training syllabus is set out in AMC FCL 4.261(d).

#### CERTIFICATE OF COMPLETION

- 5 On completion of the course, the applicant may be issued with a certificate of satisfactory completion of the course.

#### CROSS-CREDITING

- 6 A holder of a certificate of completion of MCC training on aeroplanes shall be exempted from the requirement to complete the theoretical knowledge syllabus as set out in AMC FCL 4.261(d).

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**SUBPART H**  
**INSTRUCTORS**

**ANTR-FCL 4.300 Instruction - General**

- (a) A person shall not carry out the flight instruction required for the issue of any flight engineer licence or rating unless that person has:
- (1) a flight engineer licence containing an instructor rating; or
  - (2) a specific authorisation granted by the Authority in cases where:
    - (i) new aeroplanes are introduced; or
    - (ii) vintage aeroplanes or aeroplanes of special manufacture are registered for which no person has an instructor rating.
- (b) A person shall not carry out synthetic flight instruction unless holding a TRI(E) rating or a SFI(E) authorisation.

Paragraph (a)(2) above is also valid for the synthetic flight instruction.

**ANTR-FCL 4.305 Instructor rating and authorisation - Purposes**

Two instructors categories are recognised.

- (a) Flight engineer instructor rating TRI(E).
- (b) Synthetic flight engineer instructor authorisation SFI(E).

**ANTR-FCL 4.310 Instructor ratings - General**

*Prerequisites.* All instructors shall hold at least the licence and rating for which instruction is being given (unless specified otherwise).

**ANTR-FCL 4.315 Instructor ratings - Period of validity**

- (a) All instructors ratings and authorisations are valid for a period of three years.
- (b) The validity period for a specific authorisation shall not exceed 3 years.
- (c) An applicant who fails to achieve a pass in all sections of a proficiency check before the expiry date of an instructor rating shall not exercise the privileges of that rating until the proficiency check has successfully been completed.

**ANTR-FCL 4.360 Flight engineer instructor rating (TRI(E)) - Privileges**  
(See ANTR-FCL 4.245)

The privileges of the holder of a TRI(E) rating are to instruct for the issue of a flight engineer licence and type ratings, and the training required for F/E multi-crew co-operation (see ANTR-FCL 4.245).

**ANTR-FCL 4.365 TRI(E)- Requirements**

(See Appendix 1 to ANTR-FCL 4.365)

(See AMC FCL 4.365)

An applicant for the initial issue of a TRI(E) rating shall have:

- (a)
  - (1) successfully completed an approved TRI(E) course at an approved FTO or TRTO (see Appendix 1 to ANTR-FCL 4.365);
  - (2) completed at least 1 500 hours flight time as a F/E;
  - (3) completed within the 12 months preceding the application at least 30 route sectors, to include take-offs and landing as flight engineer on the applicable aeroplane type, or a similar type as agreed by the Authority, of which not more than 15 sectors may be completed in a flight simulator; and
  - (4) conducted on a complete type rating course of at least three hours of flight instruction related to the duties of a TRI(E) on the applicable type of aeroplane and/or flight simulator under the supervision and to the satisfaction of a TRI(E) notified by the Authority for this purpose.
- (b) Before the privileges are extended to further types, the holder shall have:
  - (1) completed, within the 12 months preceding the application, at least 15 route sectors as flight engineer on the applicable type of aeroplane, or a similar type as agreed by the Authority, of which not more than 7 sectors may be completed in a flight simulator;
  - (2) satisfactorily completed the relevant technical training content of an approved TRI(E) course (see Appendix 1 to ANTR-FCL 4.365) in a FTO or a TRTO; and
  - (3) conducted on a complete type rating course at least 3 hours of flight instruction related to the duties of a TRI(E) on the applicable type of aeroplane and/or flight simulator under the supervision and to the satisfaction of a TRI(E) notified by the Authority for this purpose.

**ANTR-FCL 4.370 TRI(E) rating - Revalidation and renewal**

(See Appendix 1 to ANTR-FCL 4.365)

- (a) For revalidation of a TRI(E) rating, the applicant shall within the last 12 months preceding the expiry date of the rating:
  - (1) conduct one of the following parts of an approved type rating/refresher/recurrent training course:
    - (i) one simulator session of at least 3 hours; or
    - (ii) one flight exercise of at least 1 hour including 2 take-offs and landings; or
  - (2) receive TRI(E) refresher training acceptable to the Authority.
- (b) If the rating has lapsed the applicant shall have:

- (1) completed within the 12 months preceding the application, at least 30 route sectors to include take-offs and landings as flight engineer on the applicable aeroplane type, or a similar type as agreed by the Authority, of which not more than 15 sectors may be completed in a flight simulator;
- (2) successfully completed the relevant parts of an approved TRI(E) course (see Appendix 1 to ANTR-FCL 4.365), taking into account the recent experience of the applicant; and
- (3) conducted on a complete type rating course at least 3 hours of flight training related to the duties of a TRI(E) on the applicable type of aeroplane and/or flight simulator under the supervision and to the satisfaction of a TRI(E) notified by the Authority for this purpose.

#### **ANTR-FCL 4.405 Synthetic flight instructor authorisation (SFI(E)) – Privileges**

(See ANTR-FCL 4.261(d))

The privileges of the holder of a SFI(E) authorisation are to carry out synthetic flight instruction for type ratings, and the instruction required for F/E multi-crew co-operation (see ANTR-FCL 4.261(d)).

#### **ANTR-FCL 4.410 SFI(E) - Requirements**

(See Appendix 1 to ANTR-FCL 4.240)

(See Appendix 1 to ANTR-FCL 4.365)

- (a) An applicant for a SFI(E) authorisation shall:
  - (1) hold or have held a flight engineer licence or a non ANTR-FCL flight engineer licence acceptable to the Authority;
  - (2) have completed the simulator content of the applicable type rating course at an approved FTO or TRTO;
  - (3) have at least 1 500 hours flying experience as flight engineer;
  - (4) have completed an approved TRI(E) course (see Appendix 1 to ANTR-FCL 4.365);
  - (5) have conducted on a complete type rating course at least 3 hours of synthetic flight instruction related to the duties of a TRI(E) on a flight simulator of the applicable type of aeroplane under the supervision and to the satisfaction of a TRI(E) notified by the Authority for this purpose;
  - (6) have completed within a period of 12 months preceding the application, a proficiency check as set out in Appendix 1 to ANTR-FCL 4.240 on a flight simulator of the applicable type; and
  - (7)
    - (i) have completed within a period of 12 months preceding the application at least three route sectors as an observer on the flight deck of the applicable type or similar type as agreed by the Authority, or
    - (ii) have completed within a period of 12 months, preceding the application, at least 2 LOFT based simulator sessions conducted by qualified flight crew as an observer on the flight deck of the applicable type or similar type as agreed by the Authority. These simulator sessions shall include:

- (A) flight between 2 different airports of at least 2 hours duration each, and
  - (B) associated pre-flight planning and de-briefing.
- (b) If the privileges are to be extended to further types of aeroplanes, the holder shall have:
- (1) satisfactorily completed the simulator content of the relevant type rating course; and
  - (2) conducted on a complete type rating course at least 3 hours of synthetic flight instruction related to the duties of a TRI(E) on a flight simulator of the applicable type of aeroplane under the supervision of a TRI(E) notified by the Authority for this purpose.

**ANTR-FCL 4.415 SFI(E) - Revalidation and renewal**

- (a) For revalidation of a SFI(E) authorisation, the applicant shall within the last 12 months preceding the expiry date of the validity period of the authorisation:
- (1) conduct one simulator session of at least 3 hours as part of as a complete type rating/refreshers/recurrent training course; and
  - (2) have completed a proficiency check as set out in Appendix 1 to ANTR-FCL 4.240 on a flight simulator of the appropriate type.
- (b) If the authorisation has lapsed the applicant shall have:
- (1) completed the simulator content of the applicable type rating course;
  - (2) successfully completed an approved TRI(E) course according to the requirements of the Authority (see Appendix 1 to ANTR-FCL 4.365); and
  - (3) conducted on a complete type rating course at least 3 hours of synthetic flight instruction related to the duties of a TRI(E) on a simulator of the applicable type of aeroplane under the supervision and to the satisfaction of a TRI(E) notified by the Authority for this purpose.
  - (4) completed a proficiency check as set out in Appendix 1 to ANTR-FCL 4.240 on a flight simulator of the appropriate type.

**Appendix 1 to ANTR-FCL 4.365****Course for the type rating instructor rating for Flight Engineers (TRI(E))**

(See ANTR-FCL 4.365 )

- 1 The aim of the TRI(E) course is to train Flight Engineer licence holders with more than 1 500 hours as a F/E to the level of proficiency necessary for the issue of a TRI(E) or SFI(E) rating. The course shall be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and/or synthetic flight instruction in order to instruct for any type rating.

**TEACHING AND LEARNING**

- 2 The syllabus is set out in AMC FCL 4.365. An approved TRI(E) Teaching and Learning course shall comprise not less than 25 hours. Pilots holding or having held a FI(A) or a TRI(A) rating are credited for the TRI(E) Teaching and Learning part of the TRI(E) course.

**TECHNICAL TRAINING**

- 3 The technical training syllabus is set out in AMC FCL 4.365.

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**SUBPART I****EXAMINERS****ANTR-FCL 4.425 Examiners - General**(a) *Prerequisites*

- (1) Examiners shall hold a F/E licence and rating at least equal to the licence or rating for which they are authorised to conduct skill tests or proficiency checks and, unless specified otherwise, the privilege to instruct for this licence or rating.
- (2) Examiners shall be qualified to act as flight engineer of the aircraft during a skill test or a proficiency check, unless otherwise specified, and shall meet the applicable experience requirements set out in ANTR-FCL 4.370. Where no qualified examiner is available and, at the discretion of the Authority, examiners/inspectors may be authorised without meeting the relevant type rating requirements as mentioned above.
- (3) The applicant for an examiner authorisation shall have conducted at least one skill test in the role of an examiner for which the authorisation is sought, including briefing, conduct of the skill test, assessment of the applicant to whom the skill test is given, debriefing and recording/documentation. This "Examiner Authorisation Acceptance Test" will be supervised by an inspector of the Authority or by a senior examiner specifically authorised by the Authority for this purpose.

(b) *Compliance with ANTRs.* Examiners will be authorised in accordance with ANTR-FCL 4.030. The examiner shall comply with appropriate examiner's standardisation arrangements made or approved by the Authority.

(c) *Entries in the licence.* In licences where revalidation entries may be made by the examiner, the examiner will:

- (1) complete the following details: ratings, date of check, valid until, authorisation number and signature;
- (2) submit the original of the skill test/proficiency check form to the issuing Authority and hold one copy of the check form on personal file.

**ANTR-FCL 4.430 Examiners - period of validity**

An examiner's authorisation is valid for not more than three years. Examiners are re-authorised at the discretion of the Authority.

**ANTR-FCL 4.440 Flight engineer examiner (TRE(E)) – Privileges / Requirements**

The privileges of a TRE(E) are to conduct:

- (a) skill tests for the issue of flight engineer licence and type ratings;
- (b) proficiency checks for revalidation or renewal of flight engineer type ratings, provided that the examiner has completed not less than 1 500 hours flight time as a flight engineer on multi-pilot aeroplanes operated with a flight crew including a F/E and holds a TRI(E) authorisation.

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## **SECTION 2 – ACCEPTABLE MEANS OF COMPLIANCE (AMC)/ INTERPRETATIVE AND EXPLANATORY MATERIAL (IEM)**

### **1 GENERAL**

- 1.1 This Section contains Acceptable Means of Compliance and Interpretative/Explanatory Material that has been agreed for inclusion in ANTR-FCL 4.
- 1.2 Where a particular ANTR paragraph does not have an Acceptable Means of Compliance or any Interpretative/Explanatory Material, it is considered that no supplementary material is required.

### **2 PRESENTATION**

- 2.1 The Acceptable Means of Compliance and Interpretative/Explanatory Material are presented in full page width on loose pages, each page being identified by the date of issue or the Change number under which it is amended or reissued.
- 2.2 A numbering system has been used in which the Acceptable Means of Compliance or Interpretative/Explanatory Material uses the same number as the ANTR paragraph to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material from the ANTR itself.
- 2.3 The acronyms AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:

Acceptable Means of Compliance (AMC) illustrate a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met. It should however be noted that where a new AMC is developed, any such AMC (which may be additional to an existing AMC) will be amended into the document following consultation under the NPA procedure.

Interpretative/Explanatory Material (IEM) helps to illustrate the meaning of a requirement.

- 2.4 Explanatory Notes not forming part of the AMC or IEM text appear in a smaller typeface.
- 2.5 New, amended or corrected text is enclosed within heavy brackets

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## AMC/IEM A

## GENERAL REQUIREMENTS

IEM FCL 4.001  
Abbreviations

A	Aeroplane
A/C	Aircraft
AMC	Acceptable Means of Compliance
AMC	Aeromedical Centre
AME	Authorised Medical Examiner
AMS	Aeromedical Section
ATC	Air Traffic Control
ATP	Airline Transport Pilot
ATPL	Airline Transport Pilot Licence
CFI	Chief Flying Instructor
CGI	Chief Ground Instructor
CP	Co-pilot
CPL	Commercial Pilot Licence
CRE	Class Rating Examiner
CRI	Class Rating Instructor
CQB	Central Question Bank
ANTR-FCL	Flight Crew Licensing
FE	Flight Examiner
F/E	Flight Engineer
F/EL	Flight Engineer Licence
FI	Flight Instructor
FIE	Flight Instructor Examiner
FNPT	Flight and Navigation Procedures Trainer
FS	Flight Simulator
FSTD	Flight Synthetic Training Device
FTO	Flying Training Organisation
H	Helicopter
HT	Head of Training
ICAO	International Civil Aviation Organisation
IEM	Interpretative and Explanatory Material
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
IR	Instrument Rating
IRE	Instrument Rating Examiner
IRI	Instrument Rating Instructor
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
LOFT	Line Orientated Flight Training
MCC	Multi Crew Co-operation
ME	Multi-engine
MEL	Minimum Equipment List
MEP	Multi-engine Piston

MET	Multi-engine Turbo-prop
MPA	Multi-pilot Aeroplane
MPH	Multi-pilot Helicopter
nm	Nautical Miles
OML	Operational Multicrew Limitation
OSL	Operational Safety Pilot Limitation
OTD	Other Training Devices
PF	Pilot Flying
PIC	Pilot-In-Command
PICUS	Pilot-In-Command Under Supervision
PNF	Pilot Not Flying
PPL	Private Pilot Licence
R/T	Radiotelephony
SE	Single-engine
SEP	Single Engine Piston
SET	Single-engine Turbo-prop
SFE	Synthetic Flight Examiner
SFI	Synthetic Flight Instructor
SFI(E)	Synthetic Flight Instructor (Flight Engineer)
SPA	Single-pilot Aeroplane
SPH	Single-pilot Helicopter
SPIC	Student Pilot-In-Command
TMG	Touring Motor Glider
TR	Type Rating
TRE	Type Rating Examiner
TRE(E)	Type Rating Examiner (Flight Engineer)
TRI	Type Rating Instructor
TRI(E)	Type Rating Instructor (Flight Engineer)
TRTO	Type Rating Training Organisation
TTC	Technical Training Course
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

**AMC FCL 4.005 & 4.015****Knowledge requirements for the issue of an ANTR-FCL licence****ANTR-FCL PART 4 (FLIGHT ENGINEERS)****ANTR-FCL SUBPART A – GENERAL REQUIREMENTS**

- 4.010 – Basic authority to act as a flight crew member
- 4.015 – Acceptance of licences, ratings, authorisations, approvals or certificates
- 4.016 – Credit given to a holder of a licence issued by an ICAO Contracting State
- 4.020 – Credit for military service
- 4.025 – Validity of licences and ratings
- 4.035 – Medical fitness
- 4.040 – Decrease in medical fitness
- 4.050 – Crediting of flight time
- 4.080 – Recording of flight time
- Appendix 1 to ANTR-FCL 4.005 – Minimum requirements for the issue of a licence/authorisation
- Appendix 1 to ANTR-FCL 4.015 – Minimum requirements for the validation of flight engineer licences.

**ANTR-FCL SUBPART D – COCKPIT FLIGHT ENGINEERS**

- 4.140 – Student F/E
- 4.140 – Minimum Age
- 4.145 – Medical fitness
- 4.150 – Privileges and conditions
- 4.160 – Theoretical and practical knowledge and skill
- 4.165 – Flight instruction and experience
- 4.170 – Skill

**ANTR-FCL SUBPART F – TYPE RATINGS**

- 4.220 – Type Ratings
- 4.225 – Circumstances in which type ratings are required
- 4.230 – Special authorisation of type rating
- 4.235 – Type Ratings - Privileges, number, variants
- 4.240 – Type Ratings - Requirements
- 4.245 – Validity, revalidation and renewal
- 4.250 – Type rating – Multi-crew Co-operation
- Appendix 1 to ANTR-FCL 4.240 through ANTR-FCL 4.260 – Skill test and Proficiency check for Aeroplane Type Ratings
- Appendix 2 to ANTR-FCL 4.240 – Content of the F/E Type rating training & test/proficiency checks on multi-pilot aeroplanes requiring a minimum crew of three

**ANTR-FCL SUBPART H – INSTRUCTORS**

- 4.300 – Instruction – General
- 4.305 – Instructor ratings and authorisation – Purposes
- 4.310 – Instructor ratings – General

- 4.315 – Instructor ratings – Period of validity
- 4.360 – Flight engineer instructor rating (TRI(E)) – Privileges
- 4.365 – TRI(E) – Requirements
- 4.370 – TRI(E) rating – Revalidation and renewal
- 4.405 – Synthetic flight instructor authorisation (SFI(E)) – Privileges
- 4.410 – SFI(E) – Requirements
- 4.415 – SFI(E) – Revalidation and renewal
- Appendix 1 to ANTR-FCL 4.365 – Course for the type rating instructor rating for Flight Engineers (TRI(E))

## **ANTR–OPS SECTION 1 – REQUIREMENTS**

### **ANTR–OPS SUBPART A – APPLICABILITY**

- 1.001 – Applicability

### **ANTR–OPS SUBPART B – GENERAL**

- 1.005 – General
- 1.010 – Exemptions
- 1.025 – Common Language
- 1.030 – Minimum Equipment Lists – Operators Responsibilities
- 1.040 – Additional Crew Members
- 1.060 – Ditching
- 1.065 – Carriage of weapons of war and munitions of war
- 1.070 – Carriage of sporting weapons and ammunition
- 1.075 – Method of carriage of persons
- 1.085 – Crew responsibilities
- 1.090 – Authority of the commander
- 1.100 – Admission to flight deck
- 1.105 – Unauthorised carriage
- 1.110 – Portable electronic devices
- 1.115 – Alcohol and drugs
- 1.120 – Endangering safety
- 1.130 – Manuals to be carried
- 1.135 – Additional information and forms to be carried
- 1.140 – Information retained on the ground
- 1.145 – Power to inspect
- 1.150 – Production of documentation and records
- 1.160 – Preservation, production and use of flight recorder recordings

### **ANTR–OPS SUBPART D – OPERATIONAL PROCEDURES**

- 1.200 – Operations manual
- 1.210 – Establishment of procedures
- 1.225 – Aerodrome Operating Minima
- 1.260 – Carriage of Persons with Reduced Mobility
- 1.265 – Carriage of inadmissible passengers, deportees or persons in custody



- 1.270 – Stowage of baggage and cargo
- 1.280 – Passenger seating
- 1.285 – Passenger briefing
- 1.290 – Flight preparation
- 1.295 – Selection of aerodromes
- 1.300 – Submission of ATS Flight Plan
- 1.305 – Re/defuelling with passengers embarking, on board or disembarking
- 1.310 – Crew Members at stations
- 1.315 – Assisting means for emergency evacuation
- 1.320 – Seats, safety belts and harnesses
- 1.325 – Securing of passenger cabin and galley(s)
- 1.330 – Accessibility of emergency equipment
- 1.335 – Smoking on board
- 1.340 – Meteorological conditions
- 1.345 – Ice and other contaminants
- 1.350 – Fuel and oil supply
- 1.355 – Take-off conditions
- 1.360 – Application of take-off minima
- 1.365 – Minimum flight altitudes
- 1.370 – Simulated abnormal situations in flight
- 1.375 – In-flight fuel management
- 1.385 – Use of supplemental oxygen
- 1.390 – Cosmic radiation
- 1.395 – Ground proximity detection
- 1.400 – Approach and landing conditions
- 1.405 – Commencement and continuation of approach
- 1.410 – Operating procedures – Threshold crossing height
- 1.415 – Journey log
- 1.420 – Occurrence reporting
- 1.425 – Accident reporting
- Appendix 1 to ANTR–OPS 1.305 – Re/defuelling with passengers embarking, on board or disembarking
- Appendix 1 to ANTR–OPS 1.375 – In-flight fuel management

#### **ANTR–OPS SUBPART E – ALL WEATHER OPERATIONS**

- 1.435 – Terminology
- 1.440 – Low visibility operations – General operating rules
- 1.445 – Low visibility operations – Aerodrome considerations
- 1.450 – Low visibility operations – Training and Qualifications
- 1.455 – Low visibility operations – Operating Procedures
- 1.460 – Low visibility operations – Minimum equipment
- 1.465 – VFR Operating Minima
- Appendix 1 to ANTR–OPS 1.430 – Aerodrome Operating Minima

- Appendix 2 to ANTR–OPS 1.430(c) – Aeroplane categories – All Weather Operations

#### **ANTR–OPS SUBPART J – MASS AND BALANCE**

- 1.625 – Mass and balance documentation
- Appendix 1 to ANTR–OPS 1.625 – Mass and balance documentation

#### **ANTR–OPS SUBPART K – INSTRUMENTS AND EQUIPMENT**

- 1.630 – General introduction
- 1.640 – Aeroplane operating lights
- 1.650 – Day VFR operations – Flight and navigational instruments and associated equipment
- 1.660 – Altitude alerting system
- 1.665 – Ground proximity warning system
- 1.670 – Airborne weather radar equipment
- 1.675 – Equipment for operations in icing conditions
- 1.680 – Cosmic radiation detection equipment
- 1.690 – Crew member interphone system
- 1.695 – Public address system
- 1.700 – Cockpit voice recorders – 1
- 1.705 – Cockpit voice recorders – 2
- 1.710 – Cockpit voice recorders – 3
- 1.715 – Flight data records – 1
- 1.720 – Flight data records – 2
- 1.725 – Flight data records – 3
- 1.770 – Supplement oxygen – pressurised aeroplanes
- 1.775 – Supplement oxygen – non-pressurised aeroplanes
- 1.780 – Crew Protective Breathing Equipment
- 1.820 – Automatic Emergency Locator Transmitter

#### **ANTR–OPS SUBPART N – FLIGHT CREW**

- 1.940 – Composition of Flight Crew
- 1.945 – Conversion Training and checking
- 1.950 – Differences Training and Familiarisation training
- 1.955 – Nomination as Commander
- 1.960 – Commanders holding a Commercial Pilot Licence
- 1.965 – Recurrent training and checking
- 1.968 – Pilot qualification to operate in either pilot's seat
- 1.970 – Recent experience
- 1.975 – Pilot-in-Command – Route and Aerodrome Competence Qualification
- 1.978 – Advanced Qualification Programme
- 1.980 – Operation on more than one type or variant
- 1.985 – Training Records
- Appendix 1 to ANTR–OPS 1.940 – In flight relief of flight crew members
- Appendix 2 to ANTR–OPS 1.940 – Single-pilot operations under IFR or at night

- Appendix 1 to ANTR–OPS 1.965 – Recurrent training and checking – Pilots
- Appendix 1 to ANTR–OPS 1.968 – Pilot qualification to operate in either pilot’s seat

**ANTR–OPS SUBPART O – CABIN CREW**

- 1.990 – Number and Composition of Cabin Crew

**ANTR–OPS SUBPART P – MANUALS, LOGS AND RECORDS**

- 1.1040 – General rules for Operations Manuals
- 1.1045 – Operations Manual – structure and contents
- 1.1050 – Aeroplane Flight Manual
- 1.1055 – Journey log
- 1.1060 – Operational flight plan
- Appendix 1 to ANTR–OPS 1.1045 – Operations Manual Contents

**ANTR–OPS SUBPART Q – FLIGHT AND DUTY TIME LIMITATIONS AND REST REQUIREMENTS**

RESERVED

**ANTR–OPS SUBPART R – TRANSPORT OF DANGEROUS GOODS BY AIR**

- 1.1215 – Provision of Information

**ANTR–OPS SUBPART S – SECURITY**

- 1.1235 – Security requirements
- 1.1240 – Training programmes
- 1.1245 – Reporting acts of unlawful interference
- 1.1250 – Aeroplane search procedure checklist
- 1.1255 – Flight crew compartment security

**IEM FCL to ANTR-FCL 4.055**  
**Training and Operations Manual for TRTOs**  
 See Appendix 1 to ANTR-FCL 4.055

**TRAINING MANUAL**

Training Manuals for use at a TRTO conducting approved training courses include the following:

**Part 1 – The Training Plan**

The aim of the course (ATP, CPL/IR, CPL, F/E 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.
Pre-entry requirements	Minimum age, educational requirements (including language), medical requirements.  Any individual State requirements.
Credits for previous experience	To be obtained from the Authority before training begins.
Training Syllabi	The flying syllabus (multi-engine), the synthetic flight training syllabus and the theoretical knowledge training syllabus.
The time scale and scale, in weeks, for each syllabus	Arrangements of the course and the integration of syllabi time.
Training programme	The general arrangements of daily and weekly programmes for flying, ground and synthetic flight training.  Bad weather constraints.  Programme constraints in terms of maximum student training times, (flying, theoretical knowledge, synthetic) e.g. per day/week/month. Restrictions in respect of duty periods for students. Maximum flying hours in any day/night; maximum number of training flights in any day/night.  Minimum rest period between duty periods.
Training records	Rules for security of records and documents. Attendance records. The form of training records to be kept. Persons responsible for checking records and students' log books. The nature and frequency of record checks. Standardisation of entries in training records. Rules concerning log book entries.
Safety training	Individual responsibilities. Essential exercises. Emergency drills (frequency). Dual checks (frequency at various stages).

Tests and examinations	<p>Flying (a) Progress checks (b) Skill tests</p> <p>Theoretical Knowledge (a) Progress tests (b) Theoretical knowledge examinations</p> <p>Authorisation for test. Rules concerning refresher training before retest. Test reports and records. Procedures for examination paper preparation, type of question and assessment, standard required for 'Pass'. Procedure for question analysis and review and for raising replacement papers. Examination resit procedures.</p>
Training effectiveness	<p>Individual responsibilities. General assessment. Liaison between departments. Identification of unsatisfactory progress (individual students). Actions to correct unsatisfactory progress. Procedure for changing instructors. Maximum number of instructor changes per student. Internal feedback system for detecting training deficiencies. Procedure for suspending a student from training. Discipline. Reporting and documentation.</p>
Standards and Level of performance at various stages	<p>Individual responsibilities. Standardisation. Standardisation requirements and procedures. Application of test criteria.</p>

## Part 2 – Briefing and Air Exercises

Air Exercise	<p>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 sub-titles. This should normally be the same as the air exercise specification for the flight instructor rating course.</p>
Air exercise reference List	<p>An abbreviated list of the above exercises giving only main and sub-titles for quick reference, and preferably in flip-card form to facilitate daily use by flight instructors.</p>
Course structure - Phase of training	<p>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 shall be stated and when progress tests are to be conducted, etc.</p>

Course structure integration of syllabi	– The manner in which theoretical knowledge, synthetic flight training and flying training 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 synthetic flight training.
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 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, e.g. night flying.
Instructional methods	The TRTO requirements, particularly in respect of pre- and post-flying briefing, adherence to syllabi and training specifications, authorisation of solo flights, etc.
Progress tests	The instructions given to examining staff in respect of the conduct and documentation of all progress tests.
Glossary of terms	Definition of significant terms as necessary.
Appendices	Progress test report forms. Skill test report forms. TRTO certificates of experience, competence, etc. as required.

### Part 3 – Synthetic Flight Training

Structure generally as for Part 2.

### Part 4 – Theoretical knowledge instruction

Structure generally as for Part 2 but with a training specification and objectives for each subject. Individual lesson plans to include mention of the specific training aids available for use.

## OPERATIONS MANUAL

Operations Manual for use at an TRTO conducting approved integrated or modular flying training courses include the following:

- (a) General
- A list and description of all volumes in the Operations Manual
  - Administration (function and management)
  - Responsibilities (all management and administrative staff)
  - Student discipline and disciplinary action
  - Approval/authorisation of flights
  - Preparation of flying programme (restriction of numbers of aeroplanes in poor weather)
  - Command of aeroplane
  - Responsibilities of pilot-in-command
  - Carriage of passengers
  - Aeroplane documentation
  - Retention of documents
  - Flight crew qualification records (licences and ratings)
  - Revalidation (medical certificates and ratings)
  - Flying duty period and flight time limitations (flying instructors)
  - Flying duty period and flight time limitations (students)
  - Rest periods (flying instructors)
  - Rest periods (students)

- Pilots'/Flight Engineers' log books
  - Flight planning (general)
  - Safety (general) – equipment, radio listening watch, hazards, accidents and incidents (including reports), safety pilots etc.
- (b) Technical
- Aeroplane descriptive notes
  - Aeroplane handling (including checklists, limitations, aeroplane maintenance and technical logs, in accordance with relevant ANTRs, etc.)
  - Emergency procedures
  - Radio and radio navigation aids
  - Allowable deficiencies (based on MMEL, if available)
- (c) Route
- Performance (legislation, take-off, route, landing etc.)
  - Flight planning (fuel, oil, minimum safe altitude, navigation equipment etc.)
  - Loading (loadsheets, mass, balance, limitations)
  - Weather minima (flying instructors)
  - Weather minima (students – at various stages of training)
  - Training routes/areas
- (d) Staff Training
- Appointments of persons responsible for standards/competence of flying staff
  - Initial training
  - Refresher training
  - Standardisation training
  - Proficiency checks
  - Upgrading training
  - TRTO staff standards evaluation

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## AMC/IEM F

### TYPE RATINGS

**IEM FCL 4.240(b)****F/EL/type rating/training/skill test and proficiency check form on multi-engine multi-crew aeroplanes**

See ANTR-FCL 4.240

**APPLICATION AND REPORT FORM**

Applicant's last name:		First names:	
Type of licence:		Number:	
State:	Type rating as pilot-in-command/co-pilot*	Signature of applicant:	
Multi-engine aeroplane:		Proficiency check:	
Training record:		Type rating:	
Skill test:		F/EL:	

*Satisfactory completion of Type rating - training according to requirements is certified below:*

<b>1</b>	<b>Theoretical training for the issue of a type rating performed during period</b>		
From:	to:	at:	
Mark obtained:	% (Pass mark 75%):	Type and number of licence:	
Signature of instructor:		Name in capital letters:	

<b>2</b>	<b>Simulator (aeroplane type):</b>	Three or more axes:	YES*	NO*	Ready for service and used
Simulator manufacturer:		motion / system:			
Simulator operator:		Visual aid:	YES*	NO*	
Total training time at the controls:					
Instrument approaches at aerodromes:					
To a decision altitude/height of:					
Location/date/time:		Signature of type rating instructor/examiner (E)*:			
Type and No of licence:		Name in capital letters:			

<b>3</b>	<b>Intentionally left blank:</b>				

<b>4</b>	Skill test/Proficiency Check Remark: if the applicant failed the examiner shall indicate the reasons why	<i>Passed*</i>	<i>Failed*</i>	Flight Simulator:
Location and date				Type and number of licence
Signature of authorised examiner*				Name in capital letters

*\*delete as necessary*

**AMC FCL 4.261(d)****Multi-crew co-operation course (Aeroplane)**

See ANTR-FCL 4.261(d)

See Appendix 1 to ANTR-FCL 4.261(d)

**MULTI-CREW CO-OPERATION TRAINING**

- 1 The objectives of MCC training are optimum decision making, communication, division of tasks, use of checklists, mutual supervision, teamwork, and support throughout all phases of flight under normal, abnormal and emergency conditions. The training emphasises the development of non-technical skills applicable to working in a multi-crew environment.
- 2 The training should focus on teaching students the basics on the functioning of crew members as teams in a multi-crew environment, not simply as a collection of technically competent individuals. Furthermore, the course should provide students with opportunities to practice the skills that are necessary to be effective team leaders and members. This requires training exercises which include students as crew members in the PF and PNF and F/E roles.
- 3 Students should be made familiar with inter-personal interfaces and how to make best use of crew co-operation techniques and their personal and leadership styles in a way that fosters crew effectiveness. Students should be made aware that their behaviour during normal circumstances can have a powerful impact on crew functioning during high workload and stressful situations.
- 4 Research studies strongly suggest that behavioural changes in any environment cannot be accomplished in a short period even if the training is very well designed. Trainees need time, awareness, practice and feedback, and continual reinforcement to learn lessons that will endure. In order to be effective, multi-crew co-operation training should be accomplished in several phases spread over a period.

**BASIC MULTI-CREW CO-OPERATION COURSE**

- 5 The contents of the basic MCC course should cover theoretical knowledge training, practice and feedback in:
  - a. interfaces
    - examples of software, hardware, environment and liveware mismatches in practice
  - b. leadership/"followership" and authority
    - managerial and supervisory skills
    - assertiveness
    - barriers
    - cultural influence
    - PF and PNF roles
    - professionalism
    - team responsibility
  - c. personality, attitude and motivation
    - listening
    - conflict resolution
    - mediating
    - critique (pre-flight analyses and planning, ongoing-review, postflight)
    - team building
  - d. effective and clear communication during flight
    - listening

- feedback
  - standard phraseologies
  - assertiveness
  - participation
- e. crew co-ordination procedures
- flight techniques and cockpit procedures
  - standard phraseologies
  - discipline
- 6 The use of checklists is of special importance for an orderly and safe conduct of the flights. Different philosophies have been developed for the use of checklists. Whichever philosophy is used depends on the complexity of the aircraft concerned, the situation presented, the flight crew composition and their operating experience and the operator's procedures as laid down in the Flight Operations Manual.
- 7 Mutual supervision, information and support.
- a. Any action in handling the aircraft should be performed by mutual supervision. The pilot responsible for the specific action or task (PF or PNF) should be advised when substantial deviations (flight path, aircraft configuration etc.) are observed.
- b. Call-out procedures are essential, especially during take-off and approach, to indicate progress of the flight, systems status etc.
- c. Operation of aircraft systems, setting of radios and navigation equipment etc. should not be performed without demand by the PF or without information to the PF and his confirmation.
- 8 The contents of paragraphs 3 and 4 can best be practised by performing the exercises in IEM FCL 1.261(d) in simulated commercial air transport operations.
- 9 Practice and feedback of MCC with regard to the L-L (liveware-liveware) interface should also make provision for students for self and peer critique in order to improve communication, decision making and leadership skills. This phase is best accomplished through the use of flight simulators and video equipment. Video feedback is particularly effective because it allows participants to view themselves from a third-person perspective; this promotes acceptance of one's weak areas which encourages attitude and behavioural changes.

## EXERCISES

- 10 The exercises should be accomplished as far as possible in a simulated commercial air transport environment. The instruction should cover the following areas:
- a. pre-flight preparation including documentation, and computation of take-off performance data;
  - b. pre-flight checks including radio and navigation equipment checks and setting;
  - c. before take-off checks including powerplant checks, and take-off briefing by PF;
  - d. normal take-offs with different flap settings, tasks of PF and PNF and F/E, call-outs;
  - e. rejected take-offs; crosswind take-offs; take-offs at maximum take-off mass; engine failure after  $V_1$ ;
  - f. normal and abnormal operation of aircraft systems, use of checklists;
  - g. selected emergency procedures to include engine failure and fire, smoke control and removal, windshear during take-off and landing, emergency descent, incapacitation of a flight crew member;
  - h. early recognition of and reaction on approaching stall in differing aircraft configurations;
  - i. instrument flight procedures including holding procedures; precision approaches using raw navigation data, flight director and automatic pilot, one engine simulated inoperative approaches, non-precision and circling approaches, approach briefing by PF, setting of

navigation equipment, call-out procedures during approaches; computation of approach and landing data;

- j. go-arounds; normal and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.
- k. landings, normal, crosswind and with one engine simulated inoperative, transition from instrument to visual flight on reaching decision height or minimum descent height/altitude.

Where MCC training is combined with training for an initial type rating on a multi-pilot aeroplane, the exercises (a), (b), (c), (f), (g) and (j) may be conducted in a FTD as part of an approved course.

#### REINFORCEMENT

- 11 No matter how effective the classroom curriculum, interpersonal drills, LOFT exercises, and feedback techniques are, a single exposure during the multi-crew co-operation course for the initial issue of a multi-pilot aeroplane type rating will be insufficient. The attitudes and influences which contribute to ineffective crew co-ordination are ubiquitous and may develop over a pilot's lifetime. Thus it will be necessary that the training of non-technical skills will be an integral part of all recurrent training for revalidation of a multi-pilot aeroplane type rating as well as of the training for the issue of further multi-pilot type ratings.

**Appendix 1 to AMC FCL 4.261(d)****Multi-crew co-operation course (Aeroplane) – Certificate of completion of MCC training**

See ANTR-FCL 4.261(d)

**CERTIFICATE OF COMPLETION OF MCC-TRAINING**

Applicant's last name:		First names:	
Type of licence:		Number:	State:
issued on:		passed on:	
	Signature of applicant:		

*The satisfactory completion of MCC-Training according to requirements is certified below:*

<b>TRAINING</b>			
<b>Multi-crew co-operation training received during period:</b>			
from:	to:	at:	FTO /TRTO / operator*
Location and date:		Signature of Head of TRTO/FTO or authorised instructor*:	
Type and number of licence and State of issue:		Name in capital letters of authorised instructor:	

\* Delete as appropriate

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**AMC/IEM H**  
**INSTRUCTOR RATING**

**AMC FCL 4.365****Course for the type rating instructor rating for Flight Engineer (TRI(E))**

See ANTR-FCL 4.365

**COURSE OBJECTIVE**

The aim of the course is to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and synthetic flight instruction in order to instruct for the issue of a F/EL and any type rating for which the applicant is qualified (see ANTR-FCL 4.365).

**PART 1****TEACHING AND LEARNING**

Item No.

## 1. THE LEARNING PROCESS

- Motivation
- Perception and understanding
- Memory and its application
- Habits and transfer
- Obstacles to learning
- Incentives to learning
- Learning methods
- Rates of learning

## 2. THE TEACHING PROCESS

- Elements of effective teaching
- Planning of instructional activity
- Teaching methods
- Teaching from the "known" to the "unknown"
- Use of "lesson plans"

## 3. TRAINING PHILOSOPHIES

- Value of a structured (approved) course of training
- Importance of a planned syllabus
- Integration of theoretical knowledge and flight instruction

## 4. TECHNIQUES OF APPLIED INSTRUCTION

- (a) Theoretical knowledge - Classroom instruction techniques
  - Use of training aids
  - Group lectures
  - Individual briefings
  - Student participation/discussion
- (b) FLIGHT - Airborne instruction techniques
  - The flight/cockpit environment
  - Techniques of applied instruction
  - Post flight and inflight judgement and decision making

## 5. STUDENT EVALUATION AND TESTING

## (a) Assessment of student performance

The function of progress tests  
 Recall of knowledge  
 Translation of knowledge into understanding  
 Development of understanding into actions  
 The need to evaluate rate of progress

## (b) Analysis of student errors

Establish the reason for errors  
 Tackle major faults first, minor faults second  
 Avoidance of over criticism  
 The need for clear concise communication

## 6. TRAINING PROGRAMME DEVELOPMENT

Lesson planning  
 Preparation  
 Explanation and demonstration  
 Student participation and practice  
 Evaluation

## 7. HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION

Physiological factors  
 Psychological factors  
 Human information processing  
 Behavioural attitudes  
 Development of judgement and decision making

## 8. HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT

Selection of a safe altitude  
 Importance of "touch drills"  
 Situational awareness  
 Adherence to correct procedures

## 9. TRAINING ADMINISTRATION

Flight/theoretical knowledge instruction records  
 Pilot's personal flying log book  
 The flight/ground curriculum  
 Study material  
 Official forms  
 Aircraft Flight/Owner's Manuals/Pilot's Operating Handbooks  
 Flight authorisation papers  
 Aircraft documents  
 The private pilot's licence regulations

**PART 2****TECHNICAL TRAINING**

1. The course should be related to the type of aeroplane on which the applicant wishes to instruct. A training programme should give details of all theoretical knowledge instruction.
2. Identification and application of human factors (as set in the ATPL syllabus 040) related to multi-crew co-operation aspects of the training.



3. The content of the instruction programme should cover training exercises as applicable to the aeroplane type.

#### Training Exercises

4. Flight Simulator (items marked \* should be performed in an aeroplane if a simulator is not available)
  - (a) use of checklist, setting of radios/navigation aids and panels, power setting calculation/derating, fuel calculation, weather information, performance;
  - (b) starting engines normal/abnormal;
  - (c)\* take-off checks normal/abnormal;
  - (d)\* aborted take-off prior reaching  $V_1$ ;
  - (e)\* engine failure during take-off between  $V_1$  and  $V_2$ ;
  - (f) climb check, normal/abnormal;
  - (g) cruise check normal/abnormal;
  - (h)\* descent check, normal/abnormal;
  - (i)\* pre-landing check normal/abnormal;
  - (j)\* system monitoring/handling, emergency situations during all phases of flight;
  - (k) instrument approach to required minimum decision height or minimum descent height/altitude, manual one engine simulated inoperative during approach and landing or go around, two engines out approach (if applicable);
  - (l) rejected landing and go around; and
  - (m) on ground emergency.

#### Category II and III operations, if applicable

5.
  - (a) precision approaches, automatic with auto-throttle and flight director go-around caused by aircraft or ground equipment deficiencies;
  - (b) go around caused by weather conditions;
  - (c) go around at DH caused by offset position from centreline; and
  - (d) one of the CAT II/CAT III approaches must lead to a landing.

#### Aeroplane (not applicable for SFI(E) authorisation or zero flight time training by a TRI(E))

6.
  - (a) familiarisation with controls during outside checks;
  - (b) use of checklist, setting of radios and navigation aids, starting engines;
  - (c) taxiing;
  - (d) take-off;
  - (e) engine failure during take-off shortly after  $V_2$ , after reaching climb out attitude;
  - (f) other emergency procedures (if necessary);

- (g) instrument approach to required minimum DH, manual one engine out during approach and landing or go around;
- (h) one engine simulated inoperative go around from required minimum DH; and
- (i) one engine (critical) simulated inoperative landing.