
AIC

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FLIGHT ENGINEER'S LICENCE

1. INTRODUCTION

- 1.1 The purpose of this AIC is to supplement the regulatory requirements in accordance with the CAR 1996, Regulations 40 & 41 and Chapter 1 paragraph 3.3 of Annex 1 to the Chicago Convention.
- 1.2 This AIC sets forth a means that would be acceptable to DCA for the purpose of obtaining Flight Engineer's licence.

2. GENERAL REQUIREMENTS

- 2.1 Under provision of regulation 41(1) (I) of the Civil Aviation Regulation 1996 (CAR 1996), the Director General of DCA may grant a Flight Engineer's Licence. Such a licence entitles the holder to act as flight engineer in any aircraft registered in Malaysia for which the licence contains a valid aircraft rating. A licence will not be issued unless it contains at least one rating.
- 2.2 The applicant shall be not less than twenty one (21) years of age.

3. MEDICAL REQUIREMENTS

- 3.1 The privileges of the Flight Engineer's Licence may not be exercised unless it contains a valid Medical Certificate.
- 3.2 Unless an applicant for initial grant of the licence already holds a valid Class 1 Medical Certificate, he will be required to undergo an examination by the Designated Aviation Medical Examiner (DAME) and satisfy the examiner that he meets the medical standards laid down. These are set out in broad terms in Annex 1 to the Convention on International Civil Aviation. In general, applicants must be free from any physical disabilities or defect of hearing, vision and colour perception.
- 3.3 The normal period of validity for a Medical Certificate is twelve (12) months from the last day of the month in which it is issued. Provided the licence holder passes a further medical examination within the thirty (30) days preceding the date of expiry, a new certificate will be issued coming into effect from the date of expiry of the old certificate. If the medical examination for renewal of the certificate takes place outside this period, the new certificate will be issued as from the date on which the examination is passed.

4. PREVIOUS EXPERIENCE REQUIREMENTS

- 4.1 Before being permitted to fly as a flight engineer under training in fulfilment of the requirements specified in paragraph 5, or being permitted to enter for the technical examinations or flight tests detailed in paragraphs 6 & 7, a prospective candidate for the licence must satisfy the DCA that he has acceptable experience as an aircraft engineer, or as a professional pilot, or as an Air force Engineer, as specified below.

4.2 Aircraft Engineer Experience.

4.2.1 Where aircraft engineer experience is offered, prospective applicants must be able to show that they: -

4.2.1.1 Have completed a recognised aeronautical engineering apprenticeship or an equivalent course of training or education acceptable to the DCA, and normally have had at least twelve (12) months practical experience in the maintenance of large transport aircraft: *or*

4.2.1.2 Hold an Aircraft Maintenance Engineer's Licence (which may be a 'Licence Without Type Rating') valid for any of the following: -

- (i) Category A: Metal Aeroplanes.
- (ii) Category C: Jet Turbine or Propeller Turbine Engines.
- (iii) Category A & C: Rotorcraft (Turbine Engines).
- (iv) Category X: Instrument or Electrical or Automatic Pilot .
- (v) Category X: Instrument/ Automatic Pilots.
- (vi) Category R: Radio.

4.2.2 Has had at least twelve (12) months practical experience in the maintenance of transport aircraft, or

4.2.3 Professional Pilot Experience.

4.2.3.1 Where professional pilot experience is offered, prospective applicants must be able to show that they: -

- a. Hold a valid Senior Commercial Pilot's Licence (A/H) or Airline Transport Pilot's Licence (A/H), or
- b. Hold a valid Commercial Pilot's Licence (A/H) which includes a rating permitting them to act as a Systems Panel Operator on an aeroplane certificated for operation by three pilots and have two hundred (200) hours experience as a pilot of such aeroplanes, or
- c. Hold a valid Commercial Pilot's Licence (A/H) and have at least four hundred (400) hours experience as pilot-in-command or co-pilot on any of the types of aeroplanes / helicopter accepted by DCA.

4.2.4 Air Force Engineer Experience.

4.2.4.1 Where RMAF Air Engineer Experience is offered, prospective applicants must be able to show that they have obtained at least four hundred (400) hours flying experience in that capacity.

5. FLYING TRAINING REQUIREMENTS

5.1 Having had his previous experience assessed as acceptable, a prospective applicant for a Flight Engineer's Licence must undergo not less than one hundred (100) hours of supervised flight engineer flying rating in the first type of aircraft to be included in the licence. This may be reduced to fifty (50) hours where he holds a pilot's licence, which already includes an aircraft rating for that type. The required flying training hours may be obtained in the aircraft flight simulator but is limited up to fifty (50) hours.

5.2 The whole of the required flying training for initial grant of a licence must have been completed within the twelve (12) months immediately preceding the date of applicant for the licence.

5.3 Before a further type rating can be added to a licence the holder must obtain not less than fifty (50) hours flight engineer experience under supervision on the type. Up to half of this may be obtained on the aircraft flight simulator. The whole of this experience must be obtained within

the six (6) months immediately preceding the date of application for the additional rating.

5.4 The applicant shall have operational experience and in performing the duties of a flight engineer of an aircraft, under the supervision of a flight engineer accepted by DCA for that purpose, in at least the following areas:

- a) Normal procedures
 - pre-flight inspections
 - fuelling procedures, fuel management
 - inspection of maintenance documents
 - normal cockpit procedures during all phases of flight
 - crew co-ordination and procedures in case of crew incapacitation
 - defect reporting
- b) Abnormal and alternate (standby) procedures
 - recognition of abnormal functioning of aircraft systems
 - use of abnormal and alternate (standby) procedures
- c) Emergency procedures
 - recognition of emergency conditions
 - use of appropriate emergency procedures

5.5 The applicant shall have demonstrated the ability and skill to perform his duties as a flight engineer with a degree of competency appropriate to the privileges granted to the holder of a flight engineer licence, and to:

- a) use aircraft systems within the aircraft's capabilities and limitations;
- b) exercise good judgement and airmanship;
- c) apply aeronautical knowledge;
- d) perform all the duties as part of an integrated crew with the successful outcome never in doubt; and
- e) communicate effectively with the other flight crew members.

The use of a synthetic flight trainer for performing any of the procedures required during the demonstration of skill described in 5.5 shall be approved by DCA , which shall ensure that the synthetic flight trainer is appropriate to the task.

6. TECHNICAL KNOWLEDGE AND EXAMINATION REQUIREMENT

6.1 The flight engineer's licensing technical knowledge and examinations are in two parts:

6.1.1 Part 1 Aircraft (General)

6.1.1.1 This part is only for initial grant of the licence and is made up of three papers:

6.1.1.1.1 Technical Examination and Aircraft General Knowledge :

- a) basic principle of powerplants, gas turbines and/or piston engines; characteristics of fuels, fuel systems including fuel control; afterburners and injection systems, function and operation of engine ignition and starter systems;
- b) principle of operation, handling procedures and operating limitations of aircraft powerplants; effects of atmospheric conditions on engine performance;
- c) airframes, flight controls, structures, wheel assemblies, brake and anti-skid units, corrosion and fatigue life; identification of structural damage and defects;
- d) ice and rain protection systems;
- e) pressurization and air-conditioning systems, oxygen systems;
- f) hydraulic and pneumatic systems;
- g) basic electrical theory, electric systems (AC and DC), aircraft wiring systems, bonding and screening;
- h) principles of operation of instruments, compasses, auto-pilots, radio communication

equipment, radio and radar navigation aids, flight management systems, displays and avionics;

- i) limitation of appropriate aircraft;
- j) fire protection, detection, suppression and extinguishing systems;
- k) use and serviceability checks of equipment and systems of appropriate aircraft.
- l) operational procedures – principles of maintenance, procedures of the maintenance of airworthiness, defect reporting, pre-flight inspections, precautionary procedures for fuelling and use of external power , installed equipment and cabin systems; normal, abnormal and emergency procedures; operational procedures for carriage of freight and dangerous goods
- m) principles of flight- fundamentals of aerodynamics
- n) fundamentals of navigation; principles operation of self-contained systems
- o) operational aspects of meteorology

6.1.1.1.2 Documentation and Aviation Law.

- rules and regulations relevant to the holder of a flight engineer licence
- rules and regulations governing the operation of civil aircraft pertinent to the duties of a flight engineer.

6.1.1.1.3 Weight and Balance, Performance and Planning.

- effects of loading and mass distribution on aircraft handling, flight characteristics and performance; weight and balance calculation.
- use and practical application of performance data including procedures for cruise control.

6.1.1.1.4 Human Performance and Limitations.

- human performance relevant to the flight engineer.

6.1.1.1.5 Radio Telephony procedures and phraseology.

6.1.1.2 The examination pass mark is 70% and only failed papers need be taken again.

6.1.1.3 The syllabus for each of the papers may be obtained from the FCL office.

6.1.2 Part 2 Aircraft (Type)

6.1.2.1 This part consists of a single paper specific to the type of aircraft for which a rating is being sought. For initial grant of the licence it is taken on the first type of aircraft to be included in the licence. Subsequently it is taken on each type for which an additional rating is sought. The pass mark in each case is 70% overall and not less than 55% in any sub-section. The syllabus is may be obtained from the FCL office.

6.2 Technical examinations are held at the DCA centres. The dates and time at which examinations are to be held, application forms for enrolment and details of fees payable may be obtained from the FCL office.

6.3 The dates and times at which examinations are to be held are also published from time to time in Aeronautical Information Circulars.

6.4 Part 1 of the technical examinations may be taken at any time within the twelve (12) months immediately preceding the date of application for the licence.

6.5 Part 2 for the initial grant of the licence or for the subsequent addition of a further type rating may be taken at any time within the six (6) months immediately preceding the date of application for the licence or the additional rating; for initial issue of the licence Part 1 may be taken at the same time as Part 2 if the candidate so desires.

7. FLIGHT TEST REQUIREMENTS

- 7.1 Before an aircraft type can be included in the Aircraft Rating page of the licence, either for initial issue of the licence or an additional aircraft type, the applicant for the licence or additional rating must pass a flight test on the type. The syllabus for the test is available in the FEL requirements and may be obtained from authorized examiners or from the FCL office at PUTRAJAYA.
- 7.2 Type rating flight tests are conducted by Flight Engineer Type Rating Examiners authorized by the DCA for the purpose.
- 7.3 The whole or part of a type rating flight test may be conducted in flight or on a flight simulator approved by the DCA for the purpose. Separate items may be conducted on separate occasions and by different examiners but all the items must be passed within the 6 months immediately preceding the date of application for the licence or additional type rating.

8. ISSUE AND RENEWAL OF THE FLIGHT ENGINEER'S LICENCE

- 8.1 Application forms for grant and renewal of a Flight Engineer's Licence and details of fees payable may be obtained from the FCL office.
- 8.2 As soon as a candidate for the licence has met all the qualifying requirements he should send the completed application form together with the documentary evidence called for in the form and the licensing fee to the DCA at FCL office.
- 8.3 Licenses are issued for a period of ten (10) years at the conclusion of which they will normally be automatically renewed on yearly basis. Application and payment of the appropriate fee should be made to the FCL office.

9. MAINTENANCE OF AIRCRAFT RATING PRIVILEGES

- 9.1 Public Transport Flights.
 - 9.1.1 If the privileges of an aircraft rating entered in a licence are to be exercised on a flight being-conducted for the purpose of public transport, the holder must:
 - 9.1.1.1 Within the six (6) months immediately preceding the flight have:
 - 9.1.1.1.1 Undergone a test in the type of aircraft in which the privileges are to be exercised conducted by an Authorised Flight Engineer Type Rating Examiner. The test will consist of items selected from the syllabus and may be conducted in flight or in an approved flight simulator and;
 - 9.1.1.1.2 Have had included in the licence a Certificate of Test relating to the test and signed by the authorized examiner, or by the DCA (Flight crew Licensing office) on initial grant of the rating;
or
 - 9.1.1.2 Within the twelve (12) months immediately preceding the flight have:
 - 9.1.1.2.1 Undergone two tests as specified in paragraph 9.1.1.1.1 at an interval of not less than four months between them, and
 - 9.1.1.2.2 Had Certificate of Test entered in the licence accordingly, signed by persons authorized to sign such certificates.
- 9.2 Any Flight Other Than For Public Transport.
 - 9.2.1 If the privileges of an aircraft rating are to be exercised on any flight other than for the purposes of public transport, the holder of the licence in which it is contained must:
 - 9.2.1.1 Within the twelve (12) months immediately preceding the flight have undergone a test as specified in paragraph 9.1.1.1.1 and have had entered in his licence a Certificate of Test as specified in paragraph 9.1.1.1.2, or

9.2.1.2 Within the twelve (12) months immediately preceding the flight have had entered in the licence a Certificate of Experience, in respect of the type of aircraft in which the flight is to be conducted, signed and dated by an Authorised Flight Engineer Type Rating Examiner or by the DCA (Flight crew Licensing office). In order to have a Certificate of Experience entered in a licence the holder must produce evidence, by means of his personal flying log book, to the authorized person who is to sign the certificate that he has completed at least five (5) hours flying as a flight engineer in the preceding twelve (12) months, including at least one flight on each type of aircraft to which the certificate is to relate.

10. CONCLUSION

10.1 This AIC is issued in the exercise of the powers conferred under Section 240 of the Civil Aviation Act 1969. This AIC also makes amendments to AIC 16/2002 dated 12 Sep 2002, which is hereby superseded. This Aeronautical Information Circular (AIC) becomes effective on February 1st 2005.

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