

Document	BAR 1 Part 66 Aircraft Maintenance Licence Acceptable Means of Compliance and Guidance Material	
Version	01	



**Brunei Department of Civil Aviation**  
**Brunei Darussalam**  
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## **Brunei Aviation Requirements**

# **BAR 1 Part 66 Aircraft Maintenance Licence Acceptable Means of Compliance and Guidance Material**

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## SUBPART A — AIRCRAFT MAINTENANCE LICENCE

### SECTION A TECHNICAL REQUIREMENTS

#### GM 66.A.3 Licence categories

Individual aircraft maintenance licence holders need not be restricted to a single category. Provided that each qualification requirement is satisfied, any combination of categories may be granted.

#### AMC 66.A.10 Application

- (1) Maintenance experience should be written up in a manner that the reader has a reasonable understanding of where, when and what maintenance constitutes the experience. A task-by-task account is not necessary but at the same time a bland statement 'X years maintenance experience completed' is not acceptable. A log book of maintenance experience is desirable and some competent authorities may require such log book to be kept. It is acceptable to cross refer in the DCA Form 19 to other documents containing information on maintenance.
- (2) Applicants claiming the maximum reduction in 66.A.30 (a) total experience based upon having successfully completed 147.A.200 approved basic training should include the Part-147 certificate of recognition for approved basic training.
- (3) Applicants claiming reduction in 66.A.30 (a) total experience based upon having successfully completed technical training in an organisation or institute recognised by the competent authority as a competent organisation or institute, should include the relevant certificate of successful completion of training.

#### GM 66.A.20 (a) Privileges

- (1) The following definitions apply:

Electrical system means the aircraft electrical power supply source, plus the distribution system to the different components contained in the aircraft and relevant connectors. Lighting systems are also included in this definition. When working on cables and connectors which are part of these electrical systems, the following typical practices are included in the privileges:

- Continuity, insulation and bonding techniques and testing;
- Crimping and testing of crimped joints;
- Connector pin removal and insertion;
- Wiring protection techniques.

Avionics system means an aircraft system that transfers, processes, displays or stores analogue or digital data using data lines, data buses, coaxial cables, wireless or other data transmission medium, and includes the system's components and connectors. Examples of avionics systems include the following:

- Autoflight;
- Communication, Radar and Navigation;
- Instruments (see NOTE below);
- In Flight Entertainment Systems;

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- Integrated Modular Avionics (IMA);
- On-Board Maintenance Systems;
- Information Systems;
- Fly by Wire Systems (related to ATA27 'Flight Controls');
- Fibre Optic Control Systems.

NOTE: Instruments are formally included within the privileges of the B2 licence holders. However, maintenance on electromechanical and pitot-static components may also be released by a B1 license holder.

Simple test means a test described in approved maintenance data and meeting all the following criteria:

- The serviceability of the system can be verified using aircraft controls, switches, Built-in Test Equipment (BITE), Central Maintenance Computer (CMC) or external test equipment not involving special training.
- The outcome of the test is a unique go – no go indication or parameter, which can be a single value or a value within an interval tolerance. No interpretation of the test result or interdependence of different values is allowed.
- The test does not involve more than 10 actions as described in the approved maintenance data (not including those required to configure the aircraft prior to the test, i.e. jacking, flaps down, etc or to return the aircraft to its initial configuration). Pushing a control, switch or button, and reading the corresponding outcome may be considered as a single step even if the maintenance data shows them separated.

Troubleshooting means the procedures and actions necessary, using approved maintenance data, in order to identify the root cause of a defect or malfunction. It may include the use of BITE or external test equipment.

Line maintenance means any maintenance that is carried out before flight to ensure that the aircraft is fit for the intended flight. It may include:

- trouble shooting;
- defect rectification;
- component replacement with use of external test equipment, if required. Component replacement may include components such as engines and propellers;
- scheduled maintenance and/or checks including visual inspections that will detect obvious unsatisfactory conditions/discrepancies but do not require extensive in depth inspection. It may also include internal structure, systems and powerplant items which are visible through quick opening access panels/doors;
- minor repairs and modifications which do not require extensive disassembly and can be accomplished by simple means;
- for temporary or occasional cases (Airworthiness Directives, hereinafter AD; service bulletins, hereinafter SB) the quality manager may accept base maintenance tasks to be performed by a line maintenance organisation provided all requirements are fulfilled. The Member State will prescribe the conditions under which these tasks may be performed.

Base Maintenance means any task falling outside the criteria that are given above for Line Maintenance.

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Aircraft maintained in accordance with 'progressive' type programmes need to be individually assessed in relation to this paragraph. In principle, the decision to allow some 'progressive' checks to be carried out is determined by the assessment that all tasks within the particular check can be carried out safely to the required standards at the designated line maintenance station.

- (2) The category B3 licence does not include any A subcategory. Nevertheless, this does not prevent the B3 licence holder from releasing maintenance tasks typical of the A1.2 subcategory for piston-engine non-pressurized aeroplanes of 2 000 kg MTOM and below, within the limitations contained in the B3 licence.
- (3) The category C licence permits certification of scheduled base maintenance by the issue of a single certificate of release to service for the complete aircraft after the completion of all such maintenance. The basis for this certification is that the maintenance has been carried out by competent mechanics and category B1, B2 and B3 support staff, as appropriate, have signed for the maintenance tasks under their respective specialisation. The principal function of the category C certifying staff is to ensure that all required maintenance has been called up and signed off by the category B1, B2 and B3 support staff, as appropriate, before issue of the certificate of release to service. Only category C personnel who also hold category B1, B2 or B3 qualifications may perform both roles in base maintenance.

## **AMC 66.A.20 (b) 2 Privileges**

The 6 months maintenance experience in 2 years should be understood as consisting of two elements, duration and nature of the experience. The minimum to meet the requirements for these elements may vary depending on the size and complexity of the aircraft and type of operation and maintenance.

- (1) Duration:

Within an approved maintenance organization:

- 6 months continuous employment within the same organisation; or
- 6 months split up into different blocks, employed within the same or in different organisations.

The 6 months period can be replaced by 100 days of maintenance experience in accordance with the privileges, whether they have been performed within an approved organisation or as independent certifying staff according to M.A.801 (b) 2, or as a combination thereof.

When licence holder maintains and releases aircraft in accordance with M.A.801 (b) 2, in certain circumstances this number of days may even be reduced by 50% when agreed in advance by the competent authority. These circumstances consider the cases where the licence holder happens to be the owner of an aircraft and carries out maintenance on his own aircraft, or where a licence holder maintains an aircraft operated for low utilization, that does not allow the licence holder to accumulate the required experience. This reduction should not be combined with the 20% reduction permitted when carrying out technical support, or maintenance planning, continuing airworthiness management or engineering activities. To avoid a too long period without experience, the working days should be spread over the intended 6 months period.

- (2) Nature of the experience:

Depending on the category of the aircraft maintenance licence, the following activities are considered relevant for maintenance experience:

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- Inspection;
- Operational and functional testing;
- Trouble-shooting;
- Repairing;
- Modifying;
- Changing component;
- Supervising these activities;
- Releasing aircraft to service.

For category A licence holders, the experience should include exercising the privileges, by means of performing tasks related to the authorization on at least one aircraft type for each licence subcategory. This means tasks as mentioned in AMC 145.A.30 (g), including servicing, component changes and simple defect rectifications.

For category B1, B2 and B3, for every aircraft included in the authorization the experience should be on that particular aircraft or on a similar aircraft within the same licence (sub) category. Two aircraft can be considered as similar when they have similar technology, construction and comparable systems, which means equally equipped with the following (as applicable to the licence category):

- Propulsion systems (piston, turboprop, turbofan, turboshaft, jet-engine or push propellers); and
- Flight control systems (only mechanical controls, hydro-mechanically powered controls or electro-mechanically powered controls); and
- Avionic systems (analogue systems or digital systems); and
- Structure (manufactured of metal, composite or wood).

For licences endorsed with (sub) group ratings:

- In the case of B1 licence endorsed with (sub)group ratings (either manufacturer sub-group or full (sub)group) as defined in 66.A.45 the holder should show experience on at least one aircraft type per (sub)group and per aircraft structure (metal, composite, wood).
- In the case of a B2 licence endorsed with (sub) group ratings (either manufacturer subgroup or full (sub)group) as defined in 66.A.45 the holder should show experience on at least one aircraft type per (sub)group.
- In the case of a B3 licence endorsed with the rating '*piston-engine non-pressurized aeroplanes of 2000kg MTOM and below*' as defined in 66.A.45, the holder should show experience on at least one aircraft type per aircraft structure (metal, composite, wooden).

For category C, the experience should cover at least one of the aircraft types endorsed on the licence.

For a combination of categories, the experience should include some activities of the nature shown in paragraph 2 in each category.

A maximum of 20% of the experience duration required may be replaced by the following relevant activities on an aircraft type of similar technology, construction and with comparable systems:

- Aircraft maintenance related training as an instructor/assessor or as a student;

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- Maintenance technical support/engineering;
- Maintenance management/planning.

The experience should be documented in an individual log book or in any other recording system (which may be an automated one) containing the following data:

- Date;
- Aircraft type;
- Aircraft identification i.e. registration;
- ATA chapter (optional);
- Operation performed i.e. 100 FH check, MLG wheel change, engine oil check and complement, SB embodiment, trouble shooting, structural repair, STC embodiment...;
- Type of maintenance i.e. base, line;
- Type of activity i.e. perform, supervise, release;
- Category used A, B1, B2, B3 or C.
- Duration in days or partial-days.

### **GM 66.A.20 (b) 2 Privileges**

The sentence *'met the provision for the issue of the appropriate privileges'* included in 66.A.20(b)2 means that during the previous 2 years the person has met all the requirements for the endorsement of the corresponding aircraft rating (for example, in the case of aircraft in Group 1, theoretical plus practical element plus, if applicable, on-the-job training). This supersedes the need for 6 months of experience for the first 2 years. However, the requirement of 6 months of experience in the preceding 2 years will need to be met after the second year.

### **AMC 66.A.20 (b) 3 Privileges**

The wording *'has the adequate competence to certify maintenance on the corresponding aircraft'* means that the licence holder and, if applicable, the organisation where he/she is contracted/employed, should ensure that he/she has acquired the appropriate knowledge, skills, attitude and experience to release the aircraft being maintained. This is essential because some systems and technology present in the particular aircraft being maintained may not have been covered by the training/examination/experience required to obtain the licence and ratings.

This is typically the case, among others, in the following situations:

- Type ratings which have been endorsed on a licence in accordance with Appendix I to AMC to Part-66 'List of Type Ratings' after attending type training/on-the-job training which did not cover all the models/variants included in such rating. For example, a licence endorsed with the rating Airbus A318/A319/A320/A321 (CFM56) after attending type training/on-the-job training covering only the Airbus 320 (CFM56).
- Type ratings which have been endorsed on a licence in accordance with Appendix I to AMC to Part-66 'List of Type Ratings' after a new variant has been added to the rating in Appendix I, without performing difference training. For example, a licence endorsed with the rating Boeing 737-600/700/800/900 for a person who already had the rating Boeing 737-600/700/800, without performing any difference training for the 737-900.



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- Work being carried out on a model/variant for which the technical design and maintenance techniques have significantly evolved from the original model used in the type training/on-the-job training.
- Specific technology and options selected by each customer which may not have been covered by the type training/on-the-job training.
- Changes in the basic knowledge requirements of Appendix I to Part-66 not requiring re-examination of existing licence holders (grandfathered privileges).
- The endorsement of group/subgroup ratings based on experience on a representative number of tasks/aircraft or based on type training/examination on a representative number of aircraft.
- Persons meeting the requirements of 6 months of experience every 2 years only on certain similar aircraft types as allowed by AMC 66.A.20(b)2.
- Persons holding a Part-66 licence with limitations, obtained through conversion of national qualifications (66.A.70), where such limitations are going to be lifted after performing the corresponding basic knowledge examinations. In this case, the type ratings endorsed in the licence may have been obtained in the national system without covering all the aircraft systems (because of the previous limitations) and there will be a need to assess and, if applicable, to train this person on the missing systems.

Additional information is provided in AMC 145.A.35 (a).

#### **GM 66.A.20 (b) 4 Privileges**

- (1) Holders of a Part-66 aircraft maintenance licence may not exercise certification privileges unless they have a general knowledge of the language used within the maintenance environment including knowledge of common aeronautical terms in the language. The level of knowledge should be such that the licence holder is able to:
  - read and understand the instructions and technical manuals used for the performance of maintenance;
  - make written technical entries and any maintenance documentation entries, which can be understood by those with whom they are normally required to communicate;
  - read and understand the maintenance organisation procedures;
  - communicate at such a level as to prevent any misunderstanding when exercising certification privileges.
- (2) In all cases, the level of understanding should be compatible with the level of certification privileges exercised.

#### **AMC 66.A.25 Basic knowledge requirements**

- (1) For an applicant being a person qualified by holding an academic degree in an aeronautical, mechanical or electronic discipline from a recognised university or other higher educational institute the need for any examination will depend upon the course taken in relation to Appendix I to Part-66.
- (2) Knowledge gained and examinations passed during previous experiences, for example, in military aviation and civilian apprenticeships will be credited where the competent authority is satisfied that such knowledge and examinations are equivalent to that required by Appendix I to Part-66.

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## **GM 66.A.25 (a) Basic knowledge requirements**

The levels of knowledge for each licence (sub) category are directly related to the complexity of the certifications related to the corresponding licence (sub) category, which means that category A should demonstrate a limited but adequate level of knowledge, whereas category B1, B2 and B3 should demonstrate a complete level of knowledge in the appropriate subject modules.

## **AMC 66.A.30 (a) Basic experience requirements**

- (1) For a category C applicant holding an academic degree the representative selection of tasks should include the observation of hangar maintenance, maintenance planning, quality assurance, record-keeping, approved spare parts control and engineering development.
- (2) While an applicant to a category C licence may be qualified by having 3 years experience as category B1 or B2 certifying staff only in line maintenance, it is however recommended that any applicant to a category C holding a B1 or B2 licence demonstrate at least 12 months experience as a B1 or B2 support staff.
- (3) A skilled worker is a person who has successfully completed a training, acceptable to the competent authority, involving the manufacture, repair, overhaul or inspection of mechanical, electrical or electronic equipment. The training would include the use of tools and measuring devices.
- (4) Maintenance experience on operating aircraft:
  - Means the experience of being involved in maintenance tasks on aircraft which are being operated by airlines, air taxi organisations, owners, etc;
  - Should cover a wide range of tasks in length, complexity and variety;
  - opposed to only the training school environment.
  - May be gained within different types of maintenance organisations (Part-145, M.A. Subpart F, FAR-145, etc) or under the supervision of independent certifying staff;
  - May be combined with Part-147 approved training so that periods of training can be intermixed with periods of experience, similar to an apprenticeship.

## **AMC 66.A.30 (d) Basic experience requirements**

To be considered as recent experience; at least 50% of the required 12-month recent experience should be gained within the 12 month period prior to the date of application for the aircraft maintenance licence. The remainder of the recent experience should have been gained within the 7-year period prior to application. It must be noted that the rest of the basic experience required by 66.A.30 must be obtained within the 10 years prior to the application as required by 66.A.30 (f).

## **AMC 66.A.30 (e) Basic experience requirements**

- (1) For category A the additional experience of civil aircraft maintenance should be a minimum of 6 months. For category B1, B2 or B3 the additional experience of civil aircraft maintenance should be a minimum of 12 months.
- (2) Aircraft maintenance experience gained outside a civil aircraft maintenance environment may include aircraft maintenance experience gained in armed forces, coast guards, police etc. or in aircraft manufacturing.

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## **GM 66.A.40 Continued validity of the aircraft maintenance licence**

The validity of the aircraft maintenance licence is not affected by recency of maintenance experience whereas the validity of the 66.A.20 privileges is affected by maintenance experience as specified in 66.A.20 (a).

## **GM 66.A.45 (b) Endorsement with aircraft ratings**

An aircraft type rating includes all the aircraft models/variants listed in column 2 of Appendix I to AMC to Part-66.

When a person already holds a type rating on the licence and such type rating is amended in the Appendix I to AMC to Part 66 in order to include additional models/variants, there is no need for additional type training for the purpose of amending the type rating on the licence. The rating should be amended to include the new variants, upon request by the applicant, without additional requirements. However, it is the responsibility of the licence holder and, if applicable, the maintenance organisation where he/she is employed to comply with 66.A.20(b)3, 145.A.35(a) and M.A.607(a), as applicable, before he/she exercises certification privileges.

## **AMC 66.A.45 (d) Endorsement with aircraft ratings**

- (1) The “practical experience” should cover a representative cross section including at least 50% of tasks contained in Appendix II to AMC relevant to the licence category and to the applicable aircraft type ratings or aircraft (sub) group ratings being endorsed. This experience should cover tasks from each paragraph of the Appendix II list. Other tasks than those in the Appendix II may be considered as a replacement when they are relevant. In the case of (sub)group ratings, this experience may be shown by covering one or several aircraft types of the applicable (sub)group and may include experience on aircraft classified in group 1,2 and/or 3 as long as the experience is relevant. The practical experience should be obtained under the supervision of authorised certifying staff.
- (2) In the case of endorsement of individual type ratings for Group 2 and Group 3 aircraft, for the second aircraft type of each manufacturer (sub) group the practical experience should be reduced to 30% of the tasks contained in Appendix II to AMC relevant to the licence category and to the applicable aircraft type. For subsequent aircraft types of each manufacturer (sub) group, this should be reduced to 20%.
- (3) Practical experience should be demonstrated by the submission of records or a logbook showing the appendix II tasks performed by the applicant. Typical data to be recorded are similar to those described in AMC 66.a.20 (b) 2.

## **AMC 66.A.45 (e) Endorsement with aircraft ratings**

- (1) For the granting of manufacturer subgroup ratings for Group 2 aircraft, for B1 and C licence holders, the sentence ‘at least two aircraft types from the same manufacturer which combined are representative of the applicable manufacturer subgroup’ means that the selected aircraft types should cover the technologies relevant to the manufacturer subgroup in the following areas:
  - Flight control systems (mechanical controls/hydraulically powered controls / electromechanically powered controls); and

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- Avionic systems (analogue systems / digital systems); and
- Structure (manufactured of metal / composite / wood).

In cases where there are very different aircraft types within the same manufacturer subgroup, it may be necessary to cover more than two aircraft types to ensure adequate representation.

For this purpose it may be possible to use aircraft types from the same manufacturer classified in Group 1 as long as the selected aircraft belong to the same licence subcategory for which the rating will be endorsed.

- (2) For the granting of full subgroup ratings for Group 2 aircraft, for B1 and C licence holders, the sentence *'at least three aircraft types from different manufacturers which combined are representative of the applicable subgroup'* means that the selected aircraft types should cover all the technologies relevant to the manufacturer subgroup in the following areas:

- Flight control systems (mechanical controls/hydraulically powered controls / electromechanically powered controls); and
- Avionic systems (analogue systems / digital systems); and
- Structure (manufactured of metal / composite / wood).

In cases where there are very different aircraft types within the same subgroup, it may be necessary to cover more than three aircraft types to ensure adequate representation.

For this purpose it may be possible to use aircraft types from different manufacturers classified in Group 1 as long as the selected aircraft belong to the same licence subcategory for which the rating will be endorsed.

- (3) For manufacturer subgroup ratings, the term 'manufacturer' means the TC holder defined in the certification data sheet, which is reflected in the list of type ratings in Appendix I to AMC to Part-66.

In the case of an aircraft rating where the type rating refers to a TC holder made of a combination of two manufacturers which produce a similar aircraft (i.e. AGUSTA / BELL HELICOPTER TEXTRON or any case of aircraft similarly built by another manufacturer) this combination should be considered as one manufacturer.

As a consequence:

- When a licence holder gets a manufacturer type or a manufacturer subgroup rating made of a combination of manufacturers, it covers the combination of such manufacturers.
- When a licence holder who intends to endorse a full subgroup rating selects three aircraft from different manufacturers, this means from different combinations of manufacturers as applicable.

### **AMC 66.A.45 (d), (e) 3, (f) 1 and (g) 1 Endorsement with aircraft ratings**

- (1) The 'practical experience' should cover a representative cross section including at least 50% of tasks contained in Appendix II to AMC relevant to the licence category and to the applicable aircraft type ratings or aircraft (sub)group ratings being endorsed. This experience should cover tasks from each paragraph of the Appendix II list. Other tasks than those in the Appendix II may be considered as a replacement when they are relevant. In the case of (sub)group ratings, this experience may be shown by covering one or several aircraft types of the applicable (sub)group and

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may include experience on aircraft classified in group 1, 2 and/or 3 as long as the experience is relevant. The practical experience should be obtained under the supervision of authorised certifying staff.

- (2) In the case of endorsement of individual type ratings for Group 2 and Group 3 aircraft, for the second aircraft type of each manufacturer (sub)group the practical experience should be reduced to 30% of the tasks contained in Appendix II to AMC relevant to the licence category and to the applicable aircraft type. For subsequent aircraft types of each manufacturer (sub) group this should be reduced to 20%.
- (3) Practical experience should be demonstrated by the submission of records or a log book showing the Appendix II tasks performed by the applicant. Typical data to be recorded are similar to those described in AMC 66.A.20 (b) 2.

### **GM 66.A.45 Endorsement with aircraft ratings**

The following table shows a summary of the aircraft rating requirements contained in 66.A.45, 66.A.50 and Appendix III to Part-66.

The table contains the following:

- The different aircraft groups.
- For each licence (sub)category, which ratings are possible (at the choice of the applicant):
- Individual type ratings.
- Full and/or Manufacturer (sub)group ratings
- For each rating option, which are the qualification options.
- For the B1.2 licence (Group 3 aircraft) and for the B3 licence (piston-engine non-pressurized aeroplanes of 2 000 kg MTOM and below), which are the possible limitations to be included in the licence if not sufficient experience can be demonstrated in those areas.

Note: OJT means 'On-the-Job Training' (Appendix III to Part-66, Section 6) and is only required for the first aircraft rating in the licence (sub)category.

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<u>Aircraft rating requirements</u>			
Aircraft Groups	B1/B3 licence	B2 licence	C licence
<b>Group1</b> — Complex motor-powered aircraft. — Multiple engine helicopters. — Aeroplanes certified above FL290. — Aircraft equipped with fly-by-wire. — Other aircraft when defined by the Agency.	<b>(For B1)</b>  <b>Individual TYPE RATING</b>  Type training: - Theory + examination - Practical + assessment <b>PLUS</b> OJT (for first aircraft in licence subcategory)	<b>Individual TYPE RATING</b>  Type training: - Theory + examination - Practical + assessment <b>PLUS</b> OJT (for first aircraft in licence subcategory)	<b>Individual TYPE RATING</b>  Type training: - Theory + examination
<b>Group 2</b>  <u>Subgroups:</u> <b>2a:</b> single turboprop aeroplanes (*)  <b>2b:</b> single turbine engine helicopters (*)  <b>2c:</b> single piston engine helicopters (*) (*) Except those classified in Group 1.	<b>(For B1.1, B1.3, B1.4)</b>  <b>Individual TYPE RATING</b> (type training + OJT) or (type examination + practical experience)  <b>Full SUBGROUP RATING</b> (type training + OJT) or (type examination + practical experience) on at least 3 aircraft representative of that subgroup  <b>Manufacturer SUBGROUP RATING</b> (type training + OJT) or (type examination + practical experience) on at least 2 aircraft representative of that manufacturer subgroup	<b>Individual TYPE RATING</b> (type training + OJT) or (type examination + practical experience)  <b>Full SUBGROUP RATING</b> based on demonstration of practical experience  <b>Manufacturer SUBGROUP RATING</b> based on demonstration of practical experience	<b>Individual TYPE RATING</b> type training or type examination  <b>Full SUBGROUP RATING</b> type training or type examination on at least 3 aircraft representative of that subgroup  <b>Manufacturer SUBGROUP RATING</b> type training or type examination on at least 2 aircraft representative of that manufacturer subgroup
<b>Group3</b>  Piston engine aeroplanes (except those classified in Group 1)	<b>(For B1.2)</b>  <b>Individual TYPE RATING</b> (type training + OJT) or (type examination + practical experience)  <b>Full GROUP 3 RATING</b> based on demonstration of practical experience Limitations: ▪ Pressurized aeroplanes ▪ Metal aeroplanes ▪ Composite aeroplanes ▪ Wooden aeroplanes ▪ Metal tubing & fabric Aeroplanes	<b>Individual TYPE RATING</b> (type training + OJT) or (type examination + practical experience)  <b>Full GROUP 3 RATING</b> based on demonstration of appropriate experience	<b>Individual TYPE RATING</b> type training or type examination  <b>Full GROUP 3 RATING</b> based on demonstration of practical experience

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<u>Aircraft rating requirements</u>			
Aircraft Groups	B1/B3 licence	B2 licence	C licence
Piston-engine non-pressurized aeroplanes of 2 000 kg MTOM and below	<p>(For B3)</p> <p>FULL RATING "Piston-engine non-pressurized aeroplanes of 2 000 kg MTOM and below" based on demonstration of practical experience</p> <p>Limitations:</p> <ul style="list-style-type: none"> <li>▪ Metal aeroplanes</li> <li>▪ Composite aeroplanes</li> <li>▪ Wooden aeroplanes</li> <li>▪ Metal tubing &amp; fabric aeroplanes</li> </ul>	Not applicable	Not applicable

### AMC 66.A.50 (b) Limitations

- (1) The appropriate experience required to remove the limitations referred to in 66.A.45 (f) and (g) should consist of the performance of a variety of tasks appropriate to the limitations under the supervision of authorised certifying staff. This should include the tasks required by a scheduled annual inspection. Alternatively, this experience may also be gained, if agreed by the DCA, by theoretical and practical training provided by the manufacturer, as long as an assessment is further carried out and recorded by this manufacturer.
- (2) It may be acceptable to have this experience on just one aircraft type, provided that this type is representative of the (sub) group in relation to the limitation being removed.
- (3) The application for the limitation removal should be supported by a record of experience signed by the authorised certifying staff or by an assessment signed by the manufacturer after completion of the applicable theoretical and practical training.

### GM 66.A.70 Conversion provisions

- (1) As described in point 66.A.70, the conversion provisions apply to the holder of a certifying staff qualification valid in Brunei prior to the date of entry into force of Annex III (Part-66). The sentence "*the holder of a certifying staff qualification valid in Brunei*" means any person who had a qualification valid in Brunei allowing that person the performance of activities identical to the privileges of "certifying staff" contained in Requirement BAR 1 Part 66. This means that the signature of that person was sufficient to declare that the maintenance had been properly performed and the aircraft was ready for service and fit for flight in respect to such maintenance.

This should not be mistaken for the responsibilities linked to the airworthiness review, which was performed at different periods (typically varying from 6 months to 3 years) in the national systems. This is an activity which is performed at very specific points of time and not after every maintenance activity. As an airworthiness review is not performed after every maintenance event before the aircraft takes flight, an airworthiness review cannot be considered as a maintenance release. This means that the conversion provisions described in 66.A.70 are not applicable to persons performing airworthiness review functions unless their signature was required after every maintenance event before the aircraft can take flight.

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- (2) The conversion applies to “certifying staff qualifications” such as, for example:
- Holding a Brunei licence (or completed the process to obtain such a licence);
  - Having completed a qualification process defined by the DCA to become certifying staff;
  - Having completed the qualification requirements for certifying staff within a maintenance organisation, as defined in their procedures.

This does not mean that in order to be entitled to a conversion process, the applicant has to be exercising certification privileges. A person may hold a “certifying staff qualification” while not having certification privileges (or while exercising very limited certification privileges below his/her qualification) for different reasons such as, for example, the following:

- The person is working as “support staff” in the base maintenance environment;
- The person has been authorised only for a very limited range of tasks (lower than what he/she would be entitled if his/her qualification is considered) since the person is working in a line station where the scope of tasks is very limited;
- The person holds a licence with a wider scope than the scope of the organisation where he/she is employed;
- The person is working outside the aviation industry or is temporarily on leave due to different reasons (medical, personal, etc.).

These persons are entitled to have the conversion performed in accordance with the full scope of their qualification and the full privileges that they would be entitled to hold on the basis of such qualification.

- (3) As described in point 66.A.70, certifying staff qualifications eligible for conversion are those valid “*prior to the date of entry into force of Annex III (Part-66)*”, which means those qualifications valid before the following dates:
- 28 September 2005 for aircraft above 5 700 kg MTOM (ref. EC2042/2003, Article 7, point 3(e));
  - 28 September 2006 for aircraft of 5 700 kg MTOM and below (ref. EC2042/2003, Article 7, point 3(f)).

Nevertheless, since the B3 licence did not exist at those dates, certifying staff qualifications eligible for conversion to a B3 licence are those valid before 28 September 2012, which is the date when the authority has the obligation to start issuing such licences in accordance with (EC) 2042/2003, Article 7, point 3(h), item (i).

- (4) Although only those certifying staff qualifications gained prior to the dates indicated above are eligible for conversion, this does not mean that the application for conversion has to be submitted prior to those dates. The applicant is entitled to have the conversion performed irrespective of when he/she applies for conversion.
- (5) A certifying staff qualification can be subject to more than one conversion process and can also be converted to more than one licence (with any applicable limitations). This could be the case, for example, for a person who already had the certifying staff qualification converted to a B1.2 licence with limitations linked to some missing elements of the Part-66 Appendix I and II standard (following 66.A.70(c)). This person would be entitled to apply and have his/her certifying staff qualification converted to a B1.2 or a B3 licence on the basis of 66.A.70(d), which would mean



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that there is no need to compare with the Part-66 Appendix I and II standard, introducing only those limitations required to maintain the existing privileges.

### **GM 66.A.70(c) Conversion provisions**

For example, a limitation could be where a person holds a pre-existing certifying staff qualification which covered, to the standard of Part-66 Appendix I and II, all the

modules/subjects corresponding to the B1 licence except for electrical power systems. This person would receive a Part-66 aircraft maintenance licence in the B1 category with a limitation (exclusion) on electrical power systems.

For removal of limitations, refer to 66.A.50(c).

### **GM 66.A.70 (d) Conversion provisions**

In the case of aircraft not involved in commercial air transport other than large aircraft, an example of limitations could be where a person holds a pre Part-66 qualification which covered privileges to release work performed on aircraft structures, powerplant, mechanical and electrical systems but excluded privileges on aircraft equipped with turbine engine, aircraft above 2 000 kg MTOM, pressurised aircraft and aircraft equipped with retractable landing gear. This person would receive a Part-66 aircraft maintenance licence in the B1.2 or B3 (sub)category with the following limitations (exclusions):

- Aircraft involved in commercial air transport (this limitation always exists);
- Aircraft above 2 000 kg MTOM;
- Pressurised aircraft;
- Aircraft equipped with retractable landing gear.

Another example of limitations could be where a pilot-owner holds a pre Part-66 qualification which covered privileges to release work performed on aircraft structures, powerplant, mechanical and electrical systems but limited to his/her own aircraft and to a particular aircraft type (for example, a Cessna 172). This pilot-owner would receive a Part-66 aircraft maintenance licence in the B1.2 or B3 (sub)category with the following limitations (exclusions):

- Aircraft involved in commercial air transport (this limitation always exists);
- Aircraft other than a Cessna 172;
- Aircraft not owned by the licence holder.

The essential aspect is that the limitations are established in order to maintain the privileges of the pre Part-66 qualification, without comparing the previous qualification with the standard of Part-66 Appendix I and II. For removal of limitations, refer to 66.A.50(c).

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## Section B – Procedures for the Brunei DCA

### Subpart A – General

#### AMC 66.B.20 Record-keeping

- (1) The record-keeping system should ensure that all records are accessible whenever needed within a reasonable time. These records should be organised in a consistent way throughout the Brunei DCA (chronological, alphabetical order, etc.).
- (2) All records containing sensitive data regarding applicants or organisations should be stored in a secure manner with controlled access to ensure confidentiality of this kind of data.
- (3) All computer hardware used to ensure data backup should be stored in a different location from that containing the working data in an environment that ensures they remain in good condition. When hardware or software changes take place, special care should be taken that all necessary data continues to be accessible at least through the full period specified in 66.B.20.

#### AMC 66.B.100 Procedure for the issue of an aircraft maintenance licence by the Brunei DCA

- (1) Applicants claiming the maximum reduction in 66.A.30 (a) total experience based upon successful completion of a 147.A.200 approved basic training course should include the Part-147 certificate of recognition for approved basic training.
- (2) Applicants claiming reduction in 66.A.30(a) total experience based upon successful completion of training considered relevant by the Brunei DCA and considered as a skilled worker in a technical trade should include the relevant certificate of successful completion of training.
- (3) Applicants claiming credit against the 66.A.30 (a) total experience requirement by virtue of 66.A.30 (a) non-civil aircraft maintenance experience may only be granted such credit where the Brunei DCA has recognised such non-civil aircraft maintenance experience. The Brunei DCA will have specified who within the non-civil environment may make a statement that the applicant has met relevant maintenance experience. The applicant should include a detailed statement of such maintenance experience signed by the non-civil maintenance authority in accordance with the conditions specified by the Brunei DCA.
- (4) The Brunei DCA should check that the experience record satisfies above paragraphs in terms of content and the countersigning signature.

#### AMC 66.B.105 Procedure for the issue of an aircraft maintenance licence via the Part-145 approved maintenance organisation

- (1) The maintenance organisation approved under Part-145 should include the procedure in the organisation's exposition (Chapter 3.16) and this procedure should be audited by the Brunei DCA at least once in each 12-month period. This procedure should include a limitation stating that it is only applicable to the case where the Brunei DCA for the Part-145 approval and for the Part-66 licence is the same.
- (2) The Part-145 organisation should check that the experience records have been properly countersigned.

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- (3) The maintenance organisation approved under Part-145 may keep the experience record of applicants in a different form from that of application DCA Form 19 but such different form or manner should be acceptable to the Brunei DCA.

### **AMC 66.B.110 Procedure for the change of an aircraft maintenance licence to include an additional basic category or subcategory**

In the case of computer-generated licences, the licence should be reissued.

### **AMC 66.B.115 Procedure for the change of an aircraft maintenance licence to include an aircraft rating or to remove limitations**

- (a) Where the type training has not been conducted by a Part-147 organisation, there should be supporting documents confirming to the Brunei DCA that:
  - the type training has been approved by the Brunei DCA in accordance with 66.B.130;
  - the applicant has completed the elements of the approved type training; and
  - the trainee has been successfully examined/assessed.
- (b) Aircraft type training may be subdivided in airframe and/or powerplant and/or avionics/electrical systems type training courses.
  - (i) Airframe type training course means a type training course including all relevant aircraft structure and electrical and mechanical systems excluding the powerplant.
  - (ii) Powerplant type training course means a type training course on the bare engine, including the build-up to a quick engine change unit.
  - (iii) The interface of the engine/airframe systems should be addressed by either airframe or powerplant type training course. In some cases, such as for general aviation, it may be more appropriate to cover the interface during the airframe course due to the large variety of aircraft that can have the same engine type installed.
  - (iv) Avionics/electrical systems type training course means type training on avionics and electrical systems covered by but not necessarily limited to ATA Chapters 22, 23, 24, 25, 27, 31, 33, 34, 42, 44, 45, 46, 73 and 77 or equivalent.
- (c) For the acceptance of the OJT programme described in Section 6 of Appendix III to Part-66, the Brunei DCA should develop adequate procedures which may be similar to the procedure described in AMC 66.B.130 for the “direct approval of aircraft type training”. In the case where the Brunei DCA is different from the competent authority of the maintenance organisation which provides the OJT, the Brunei DCA may take into consideration the fact that the maintenance organisation may already have the OJT programme accepted by their own competent authority (through Chapter 3.15 of the MOE, as described in AMC 145.A.70(a)).

### **AMC 66.B.100 to 115**

Aircraft type endorsement should use the standard codes contained in Appendix I to the AMCs.

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## **AMC 66.B.120 Procedure for the renewal of an aircraft maintenance licence validity**

The Brunei DCA should not carry out any investigation to ensure that the licence holder is in current maintenance practice as this is not a condition for the renewal of a licence. Ensuring the continued validity of the certification privileges is the responsibility of the approved Part-145/ Subpart-F maintenance organisation or the certifying staff in accordance with M.A.801 (b) 2. For the purpose of ensuring the continued validity of the certification privileges the competent authority may, when periodically reviewing the organisations in accordance with 145.B.30 or M.B.604, or during on-the-spot checks, request the licence holder to provide documentary evidence of compliance with 66.A.20 (b) when exercising certification privileges.

## **AMC 66.B.130 Procedure for the direct approval of aircraft type training**

(1) The procedure for the direct approval of type training courses by the Brunei DCA should require that the following aspects are described by the organisation providing the training:

- The content and the duration of the theoretical and/or practical elements, as applicable, in accordance with Appendix III to Part-66, including the Training Need Analysis (TNA);
- The teaching methods and instructional equipment;
- The material and documentation provided to the student;
- The qualification of instructors, examiners and/or assessors, as applicable;
- The examination and/or assessment procedure, as applicable. Further guidance about

the assessment and the designated assessors is given in Appendix III to AMC to Part-66;

- The documentation and records to be provided to the student to justify the satisfactory completion of the training course and related examination/assessment. This should include not only a certificate of completion but enough documentation and records to justify that the content and duration approved has been met and that the examination/assessment has been successfully passed.

- (2) The above criteria apply to a full course as well as to a partial course such as the practical element of a type training course and its assessment.
- (3) The procedure should also indicate how the Brunei DCA is going to audit the proper
- (4) The direct approval of aircraft type training should be done on a case-by-case basis and should not be granted for long-term periods, since it is not a privilege of the organisation providing the training.

## **GM 66.B.200 Examination by the Brunei DCA**

- (1) Questions may be prepared in the national language but the use of aviation English is recommended wherever possible.
- (2) The primary purpose of essay questions is to determine that the candidates can express themselves in a clear and concise manner and can prepare a concise technical report, which is why only a few essay questions are required.

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- (3) Oral type questions may not be used as the primary means of examination because of the difficulty in establishing consistency of standards between examiners or day-to-day.

However, nothing prevents the Brunei DCA from meeting potential certifying staff for the purpose of ensuring that they understand their obligations and responsibilities in the application of maintenance Parts.

- (4) For pass mark purposes, the essay questions should be considered as separate from the multiple choice questions.
- (5) Multiple choice question (MCQ) generation.

The following principles should be observed when developing multiple choice questions:

- (a) The examination should measure clearly formulated goals. Therefore, the field and depth of knowledge to be measured by each question should be fully identified.
- (b) All the questions should be of the multiple choice type with three alternative answers.
- (c) Questions that require specialised knowledge of specific aircraft types should not be asked in a basic licence examination.
- (d) The use of abbreviations and acronyms should generally be avoided. However, where needed, only internationally recognised abbreviations and acronyms should be used. In case of doubt, use the full form, e.g. angle of attack = 12 degrees instead of  $\alpha = 12^\circ$ .
- (e) Questions and answers should be formulated as simply as possible: the examination is not a test of language. Complex sentences, unusual grammar and double negatives should be avoided.
- (f) A question should comprise one complete positive proposition. No more than 3 different statements should appear among the suggested responses; otherwise, the candidate may be able to deduce the correct answer by eliminating the unlikely combinations of statements.
- (g) Questions should have only one true answer.
- (h) The correct answer should be absolutely correct and complete or, without doubt, the most preferable. Responses that are so essentially similar that the choice is a matter of opinion rather than a matter of fact should be avoided. The main interest in MCQs is that they can be quickly performed: this is not achieved if doubt exists about the correct answer.
- (i) The incorrect alternatives should seem equally plausible to anyone ignorant of the subject. All alternatives should be clearly related to the question and be of similar vocabulary, grammatical structure and length. In numerical questions, the incorrect answers should correspond to procedural errors such as corrections applied in the wrong sense or incorrect unit conversions: they should not be mere random numbers.
- (j) Calculators are not allowed during examination. Therefore, all calculations should be feasible without a calculator. Where a question involves calculations not feasible without a calculator, such as 10, then the question should specify the approximate value of 10.
- (k) Questions should be referred to Part-66 Appendix I examination syllabus.

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(6) Essay question generation:

- (a) The purpose of the essay is to allow the Brunei DCA to determine if candidates can express themselves in a clear and concise manner in the form of a written response, in a technical report format using the technical language of the aviation industry. The essay examination also allows assessing, in part, the technical knowledge retained by the individual and with a practical application relevant to a maintenance scenario.
- (b) Questions should be written so as to be broad enough to be answered by candidates for all licence category or subcategories (Cat A, B1, B2 and B3) and comply with the following general guidelines:
  - the question topic selected should be generic, applicable to mechanical as well as avionic licence categories and have a common technical difficulty level as indicated in Part -66, Appendix I;
  - cover technology applicable to most areas of aircraft maintenance;
  - reflects common working practises;
  - it is not type or manufacturer specific and avoids subjects which are rarely found in practice;
  - when drafting a question, there is a need to ensure that consideration is given to the
  - limited practical experience that most candidates will have.
- (c) To make the questions and the marking procedures as consistent as possible, each question and model answer, with the required key areas (see below), should be reviewed independently by at least 2 technical staff members.
- (d) When raising questions, the following should be considered:
  - Each essay question will have a time allowance of 20 minutes.
  - A complete A4 side is provided for each question and answer; if required, the answer can be extended onto the reverse side of the page.
  - The question should be such that the answer expected will be at the level shown for that subject in the module syllabus.
  - The question should not be ambiguous but should seek a broad reply rather than be limited in scope for answer.
  - The question should lend itself to be written in a technical report style, in a logical sequence (beginning, middle and end), containing the applicable and relevant technical words needed in the answer.
  - Do not ask for drawings/sketches to support the essay.
  - The question should be relevant to the category and level of difficulty listed in the syllabus, e.g. a description of a typical general aviation system may not be acceptable for a typical commercial aeroplane.
  - Subject to obvious constraints in relation to the topic being addressed the question should have a strong bias towards the practical maintenance of a system/component and the answer should show an understanding of normal and deteriorated conditions of an aircraft and its systems. Variations on alternative possible answers which have not been thought of may have to be taken into

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account to aid the examiner when marking. If considered relevant, the model answer should be amended to include these new points.

- (e) Because of the difficulty in marking an essay answer using key points only, there is a need for the way in which the report was written to be assessed and taken into consideration.
- (f) The total points for each question will add up to 100 and will need to reflect both the combination of the technical (key point) element and the report style element.
- (g) Each key point will be graded upon its importance and have point weighting allocated to it. The total weight will represent 60 % of the mark.
- (h) Key points are the 'important elements' that may be knowledge- or experience-based and will include other maintenance-orientated factors such as relevant safety precautions or legislative practices, if applicable. Excessive reference to the need for MM referral or safety checks may be considered wasteful.
- (i) The answer to the question will be analysed for the clarity and manner in which the essay report is presented and have a weighting allocated to it which will represent 40 % of the mark.
- (j) The answer should show the candidate's ability to express himself/herself in technical language. This includes readability of the language, basic grammar and use of terminology.
- (k) The report starts in the beginning and has logical process to reach a conclusion.
- (l) Supporting diagrams should not be encouraged but, if used, should supplement the answer and not replace the need for a broad text answer.
- (m) The report should not be indexed, itemised or listed.
- (n) Within reason, the candidate should not be penalised for incorrect spelling.
- (o) A zero mark should only be given in exceptional circumstances. Even if the student misunderstands the question and gives an answer to a different question, a sympathetic mark even if only for the report style should be given, this could add up to the maximum percentage allowed.
- (p) The two allocated marks should be added together and written into the answer paper.
- (q) If an answer resulting in a borderline failure is principally due to "written report errors," the paper should be discussed and the mark agreed, if possible, with another examiner.

## GM 66.B.300 General

As described in point 66.B.300, certifying staff qualifications eligible for conversion are those valid *"prior to the entry into force of the applicable requirements of BAR1Part-66"*, which means those qualifications valid before the following dates:

Nevertheless, since the B3 licence did not exist at those dates, certifying staff qualifications eligible for conversion to a B3 licence are those valid before 28 September 2012, which is the date where the authority has the obligation to start issuing such licences in accordance with (EC)

2042/2003, Article 7, point 3(h), item (i).

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### **AMC 66.B.305 (a) Conversion report for national qualifications**

- (1) Conversion reports prepared on the basis of point 66.A.70(c) should include a comparison between the scope of the national qualification (i.e., the national qualification requirements) and the scope of the Part-66 licence qualification (i.e., the Part-66 qualification requirements), which should be performed on the basis of a detailed analysis of the national and Part-66 basic qualification standards. The report should identify where a difference between the two standards exists and where such a difference would lead to a limitation on the Part-66 licence.
- (2) Conversion reports prepared on the basis of point 66.A.70 (d), which are limited to aircraft not involved in commercial air transport other than large aircraft, should include the privileges associated to the national qualification. The report should identify which limitations are needed on the Part-66 licence to maintain these privileges.

### **GM 66.B.305 (b) 3 Conversion report for national qualifications**

As conversions performed on the basis of 66.A.70 (d) are aimed to maintain the privileges of the pre-existing national qualification, the limitations introduced on the Part-66 licence are not linked to possible differences between the scope of the national qualification and the scope of the Part-66 licence qualification. This conversion does not include such comparison. This means that, in order to remove such limitations, full compliance with the conditions of Part-66 needs to be demonstrated.

### **AMC 66.B.310 (a) Conversion report for approved maintenance organisations Authorisations**

- (1) Conversion reports prepared on the basis of point 66.A.70(c) should include a comparison between the qualification required for each type of organisation authorisation and the scope of the Part-66 licence qualification, which should be performed on the basis of a detailed analysis of the organisation and Part-66 basic qualification standards. The report should identify where a difference between the two standards exists and where such a difference would lead to a limitation on the Part-66 licence.
- (2) Conversion reports prepared on the basis of point 66.A.70 (d), which is limited to aircraft not involved in commercial air transport other than large aircraft, should include the privileges associated with the organisation authorisation. The report should identify which limitations are needed on the Part-66 licence to maintain these privileges.

### **GM 66.B.310 (b)3 Conversion report for approved maintenance organisations Authorisations**

As conversions performed on the basis of 66.A.70(d) are aimed to maintain the privileges of the pre-existing organisation authorisations, the limitations introduced on the Part-66 licence are not linked to possible differences between the qualification required for the organisation authorisation and the Part-66 licence qualification. This conversion does not include such comparison. This means that, in order to remove such limitations, full compliance with the conditions of Part-66 needs to be demonstrated.



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## GM 66.B.410 Examination credit validity

In the case of credits expired in accordance with 66.A.25(d) and 66.B.410(b), the new application for credits will lead to a reassessment in accordance with 66.B.405 and 66.B.410 only in those cases where the requirements contained in Appendix I to Part-66 have changed. This may lead to a requirement for further examinations on particular modules/sub-modules/subjects.

## AMC to Section 1 of Appendix III to Part-66 “Aircraft Type Training and Examination Standard. On-the-Job Training” Aircraft type training

- (1) Aircraft type training may be subdivided in airframe and/or powerplant and/or avionics/electrical systems type training courses:
  - Airframe type training course means a type training course including all relevant aircraft structure and electrical and mechanical systems excluding the powerplant.
  - Powerplant type training course means a type training course on the bare engine, including the build-up to a quick engine change unit.
  - The interface of the engine/airframe systems should be addressed by either airframe or powerplant type training course. In some cases, such as for general aviation, it may be more appropriate to cover the interface during the airframe course due to the large variety of aircraft that can have the same engine type installed.
  - Avionics/electrical systems type training course means type training on avionics and electrical systems covered by but not necessarily limited to ATA (Air Transport Association) Chapters 22, 23, 24, 25, 27, 31, 33, 34, 42, 44, 45, 46, 73 and 77 or equivalent.
- (2) Practical training may be performed either following or integrated with the theoretical elements. However, it should not be performed before theoretical training.
- (3) The content of the theoretical and practical training should:
  - address the different parts of the aircraft which are representative of the structure, the systems/components installed and the cabin; and
  - include training on the use of technical manuals, maintenance procedures and the interface with the operation of the aircraft.

Therefore, it should be based on the following elements:

- Type design including relevant type design variants, new technology and techniques;
- Feedback from in-service difficulties, occurrence reporting, etc.;
- Significant applicable airworthiness directives and service bulletins;
- Known human factor issues associated with the particular aircraft type;
- Use of common and specific documentation, (when applicable, such as MMEL, AMM, MPD, TSM, SRM, WD, AFM, tool handbook), philosophy of the troubleshooting, etc.;
- Knowledge of the maintenance on-board reporting systems and ETOPS maintenance conditions, when applicable;

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- Use of special tooling and test equipment and specific maintenance practises including critical safety items and safety precautions;
- Significant and critical tasks/aspects from the MMEL, CDL, Fuel Tank Safety (FTS), airworthiness limitation items (ALI) including Critical Design Configuration Control Limitations (CDCCL), CMR and all ICA documentation such as MRB, MPD, SRM, AMM, etc., when applicable.
- Maintenance actions and procedures to be followed as a consequence of specific certification requirements, such as, but not limited to, RVSM (Reduced Vertical Separation Minimum) and NVIS (Night Vision Imaging Systems);
- Knowledge of relevant inspections and limitations as applicable to the effects of environmental factors or operational procedures such as cold and hot climates, wind, moisture, sand, de-icing/anti-icing, etc.

The type training does not necessarily need to include all possible customer options corresponding to the type rating described in the Appendix I to AMC to Part-66.

- (4) Limited avionic system training should be included in the category B1 type training as the B1 privileges include work on avionics systems requiring simple tests to prove their serviceability.
- (5) Electrical systems should be included in both categories of B1 and B2 type training.
- (6) The theoretical and practical training should be complementary and may be:
  - Integrated or split;
  - Supported by the use of training aids, such as, trainers, virtual aircraft, aircraft components, synthetic training devices (STD), computer-based training devices (CBT), etc.

### **AMC to Paragraph 3.1(d) of Appendix III to Part-66 “Aircraft Type Training and Examination Standard. On-the-Job Training”**

Training Needs Analysis for the theoretical element of the aircraft type training

- (1) The minimum duration for the theoretical element of the type rating training course, as described in Appendix III to Part-66, has been determined based on:
  - generic categories of aircraft and minimum standard equipment fit;
  - the estimated average duration of standard courses imparted in Europe.
- (2) The purpose of the Training Needs Analysis (TNA) is to adapt and justify the duration of the course for a specific aircraft type. This means that the TNA is the main driver for determining the duration of the course, regardless of whether it is above or below the minimum duration described in Appendix III to Part-66. In the particular case of type training courses approved on the basis of the requirements valid before Regulation (EU) 1149/2011 was applicable (01 August 2012) and having a duration for the theoretical element equal to or above the minimum duration contained in paragraph 3.1(c) of Appendix III to Part-66, it is acceptable that the TNA only covers the differences introduced by Regulation (EU) 1149/2011 in paragraph 3.1(e) “Content” and the criteria introduced in paragraph 3.1(d) “Justification of course duration” related to the minimum attendance and the maximum number of training hours per day. This TNA may result in a change in the duration of the theoretical element.
- (3) The content and the duration deriving from the TNA may be supported by an analysis from the Type Certificate holder.

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- (4) In order to approve a reduction of such minimum duration, the evaluation done by the Brunei DCA should be performed on a case-by-case basis appropriate to the aircraft type. For example, while it would be exceptional for a theoretical course for a large transport category aircraft such as an A330 or B757 to be below the minimum duration shown, it would not necessarily be exceptional in the case of a General Aviation (GA) business aircraft such as a Learjet 45 or similar. Typically, the TNA for a GA aircraft course would demonstrate that a course of a shorter duration satisfies the requirements.
- (5) When developing the TNA, the following should be considered:
- The TNA should include an analysis identifying all the areas and elements where there is a need for training as well as the associated learning objectives, considering the design philosophy of the aircraft type, the operational environment, the type of operations and the operational experience. This analysis should be written in a manner which provides a reasonable understanding of which areas and elements constitute the course to meet the learning objectives.
  - As a minimum, the Training Need Analysis (TNA) should take into account all the applicable elements contained in paragraph 3.1 of Part-66 Appendix III and associated AMCs.
  - The TNA should set up the course content considering the Appendix III objectives for each level of training and the prescribed topics in the theoretical element table contained in paragraph 3.1 of Part-66 Appendix III.
  - For each Chapter described in the theoretical element table contained in paragraph 3.1 of Part-66 Appendix III, the corresponding training time should be recorded.
  - Typical documents to be used to identify the areas and elements where there is a need for training typically include, among others, the Aircraft Maintenance Manual, MRB report, CMRs, airworthiness limitations, Troubleshooting Manual, Structural Repair Manual, Illustrated Parts Catalogue, Airworthiness Directives and Service Bulletins.
  - During the analysis of these documents:  
Consideration should be given to the following typical activities:
    - Activation/reactivation;
    - Removal/installation;
    - Testing;
    - Servicing;
    - Inspection, check and repairs;
    - Troubleshooting/diagnosis.

For the purpose of identifying the specific elements constituting the training course, it is acceptable to use a filtering method based on criteria such as:

    - Frequency of the task;
    - Human factor issues associated to the task;
    - Difficulty of the task;
    - Criticality and safety impact of the task;

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- In-service experience;
- Novel or unusual design features (not covered by Part-66 Appendix I);
- Similarities with other aircraft types;
- Special tests and tools/equipment.

It is acceptable to follow an approach based on:

- Tasks or groups of tasks; or
- stems or subsystems or components.

(g) The TNA should:

Identify the learning objectives for each task, group of tasks, system, subsystem or component;

- Associate the identified tasks to be trained to the regulatory requirements (table in paragraph 3.1 of Appendix III to Part-66);
- Organise the training into modules in a logical sequence (adequate combination of chapters as defined in Appendix III of Part-66);
- Determine the sequence of learning (within a lesson and for the whole syllabus);
- Identify the scope of information and level of detail with regard to the minimum standard to which the topics of the TNA should be taught according to the set-up objectives.
- Address the following:
  - Description of each system/component including the structure (where applicable);
  - System/component operation taking into account:
    - (i) Complexity of the system (e.g. the need of further breakdown into subsystems, etc.);
    - (ii) Design specifics which may require more detailed presentation or may contribute to maintenance errors;
    - (iii) Normal and emergency functioning;
    - (iv) Troubleshooting;
    - (v) Interpretation of indications and malfunctions;
    - (vi) Use of maintenance publications;
    - (vii) Identification of special tools and equipment required for servicing and maintaining the aircraft;
    - (viii) Maintenance Practices;
    - (ix) Routine inspections, functional or operational tests, rigging/adjustment, etc.
- Describe the following:
  - (i) The instructional methods and equipment, teaching methods and blending of the teaching methods to ensure the effectiveness of the training;

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- (ii) The maintenance training documentation/material to be delivered to the student;
- (iii) Facilitated discussions, questioning session, additional practice-oriented training, etc.;
- (iv) The homework, if developed;
- (v) The training provider's resources available to the learner.
- (h) It is acceptable to differentiate between issues which have to be led by an instructor and issues which may be delivered through interactive simulation training devices and/or covered by web-based elements. Overall time of the course will be allocated accordingly.
- (i) The maximum number of training hours per day for the theoretical element of type training should not be more than 6 hours. A training hour means 60 minutes of tuition excluding any breaks, examination, revision, preparation and aircraft visit. In exceptional cases, the Brunei DCA may allow deviation from this standard when it is properly justified that the proposed number of hours follows pedagogical and human factors principles. These principles are especially important in those cases where:
  - Theoretical and practical training are performed at the same time;
  - Training and normal maintenance duty/apprenticeship are performed at the sametime.
- (j) The minimum participation time for the trainee to meet the objectives of the course should not be less than 90 % of the tuition hours of the theoretical training course. Additional training may be provided by the training organisation in order to meet the minimum participation time. If the minimum participation defined for the course is not met, a certificate of recognition should not be issued.
- (k) The TNA is a living process and should be reviewed/updated based on operation feedback, maintenance occurrences, Airworthiness Directives, major service bulletins impacting maintenance activities or requiring new competencies for mechanics, alert service bulletins, feedback from trainees or customer satisfaction, evolution of the maintenance documentation such as MRBs, MPDs, MMs, etc. The frequency at which the TNA should be reviewed/updated is left to the discretion of the organisation conducting the course.

NOTE: The examination is not part of the TNA. However, it should be prepared in accordance with the learning objectives described in the TNA.

#### **AMC to Paragraphs 1(b), 3.2 and 4.2 of Appendix III to Part-66**

#### **“Aircraft Type Training and Examination Standard. On-the-Job Training”**

#### **Practical element of the aircraft type training**

- (1) The practical training may include instruction in a classroom or in simulators but part of the practical training should be conducted in a real maintenance or manufacturer environment.
- (2) The tasks should be selected because of their frequency, complexity, variety, safety, criticality, novelty, etc. The selected tasks should cover all the chapters described in the table contained in paragraph 3.2 of Appendix III to Part-66.

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- (3) The duration of the practical training should ensure that the content of training required by paragraph 3.2 of Appendix III to Part-66 is completed. Nevertheless, for aeroplanes with a MTOM equal or above 30 000 kg, the duration for the practical element of a type rating training course should not be less than two weeks unless a shorter duration meeting the objectives of the training and taking into account pedagogical aspects (maximum duration per day) is justified to the Brunei DCA.
- (4) The organisation providing the practical element of the type training should provide trainees with a schedule or plan indicating the list of tasks to be performed under instruction or supervision. A record of the tasks completed should be entered into a logbook which should be designed such that each task or group of tasks may be countersigned by the designated assessor. The logbook format and its use should be clearly defined.
- (5) In paragraph 4.2 of Appendix III to Part-66, the term “designated assessors appropriately qualified” means that the assessors should demonstrate training and experience on the assessment process being undertaken and be authorised to do so by the organisation. Further guidance about the assessment and the designated assessors is provided in Appendix III to AMC to Part-66.
- (6) The practical element (for powerplant and avionic systems) of the Type Rating Training may be subcontracted by the approved Part-147 organisation under its quality system according to the provisions of 147.A.145(d)3 and the corresponding Guidance Material.

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## AMC to Paragraph 1(c) of Appendix III to Part-66

### “Aircraft Type Training and Examination Standard. On-the-Job Training”

#### Differences training

Approved difference training is not required for different variants within the same aircraft type rating (as specified in Appendix I to AMC to Part-66) for the purpose of type rating endorsement on the aircraft maintenance licence. However, this does not necessarily mean that no training is required before a certifying staff authorisation can be issued by the maintenance organisation (refer to AMC 66.A.20(b)3).

## AMC to Section 5 of Appendix III to Part-66

### “Aircraft Type Training and Examination Standard. On-the-Job Training”

#### Type Examination Standard

This Section 5 “Type Examination Standard” does not apply to the examination performed as part of type training. This Section only applies to those cases where type examination is performed as a substitute for type training.

## AMC to Section 6 of Appendix III to Part-66

### “Aircraft Type Training and Examination Standard. On-the-Job Training”

#### On-the-Job Training (OJT)

- (1) *“A maintenance organisation appropriately approved for the maintenance of the particular aircraft type”* means a Part-145 or M.A. Subpart F approved maintenance organisation holding an A rating for such aircraft.
- (2) The OJT should include one-to-one supervision and should involve actual work task performance on aircraft/components, covering line and/or base maintenance tasks.
- (3) The use of simulators for OJT should not be allowed.
- (4) The OJT should cover at least 50 % of the tasks contained in Appendix II to AMC to Part-66.

Some tasks should be selected from each paragraph of the Appendix II list. Tasks should be selected among those applicable to the type of aircraft and licence (sub)category applied for. Other tasks than those in the Appendix II may be considered as a replacement when they are relevant. Typically, in addition to the variety and the complexity, the OJT tasks should be selected because of their frequency, safety, novelty, etc.

- (5) Up to 50 % of the required OJT may be undertaken before the aircraft theoretical type training starts.
- (6) The organisation providing the on-the-job training should provide trainees with a schedule or plan indicating the list of tasks to be performed under supervision. A record of the tasks completed should be entered into a logbook which should be designed such that each task or group of tasks is countersigned by the corresponding supervisor. The logbook format and its use should be clearly defined.
- (7) Regarding the day-to-day supervision of the OJT programme in the approved maintenance organisation and the role of the supervisor(s), the following should be considered:

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- It is sufficient that the completion of individual OJT tasks is confirmed by the direct supervisor(s), without being necessary the direct evaluation of the assessor.
- During the day-to-day OJT performance, the supervision aims at overseeing the complete process, including task completion, use of manuals and procedures, observance of safety measures, warnings and recommendations and adequate behaviour in the maintenance environment.
- The supervisor(s) should personally observe the work being performed to ensure the safe completeness and should be readily available for consultation, if needed during the OJT performance.
- The supervisor(s) should countersign the tasks and release the maintenance tasks as the trainee is still not qualified to do so.
- The supervisor(s) should therefore:
  - have certifying staff or support staff privileges relevant to the OJT tasks;
  - be competent for the selected tasks;
  - be safety-orientated;
  - be capable to coach (setting objectives, giving training, performing supervision, evaluating, handling trainee's reactions and cultural issues, managing objectively and positively debriefing sessions, determining the need for extra training or reorientate the training, reporting, etc.);
  - be designated by the approved maintenance organisation to carry out the supervision.

(8) Regarding the assessor, the following should be considered:

- The function of the assessor, as described in Section 6 of Appendix III to Part-66, is to conduct the final assessment of the completed OJT. This assessment should include confirmation of the completion of the required diversity and quantity of OJT and should be based on the supervisor(s) reports and feedback.
- In Section 6 of Appendix III to Part-66, the term “designated assessor appropriately qualified” means that the assessor should demonstrate training and experience on the assessment process being undertaken and should be authorised to do so by the organisation.

Further guidance about the assessment and the designated assessors is provided in Appendix III to AMC to Part-66.

(9) The procedures for OJT should be included into the Exposition Manual of the approved maintenance organisation (Chapter 3.15, as indicated in AMC 145.A.70(a)). However, since these procedures in the Exposition Manual are approved by the Brunei DCA and providing training is not one of the privileges of a maintenance organisation, they can only be used when the Brunei DCA has oversight of the maintenance organisation. In other cases, it is up to the Brunei DCA to decide whether it accepts such procedures for the purpose of approving the OJT (refer to AMC 66.B.115).

## **AMC to Appendix III to Part-66 “Aircraft Type Training and Examination Standard.**

### **On-the-Job Training”**

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### **Aircraft type training and On-the-Job Training**

The theoretical and practical training providers, as well as the OJT provider, may contract the services of a language translator in the case where training is imparted to students not conversant in the language of the training material. Nevertheless, it remains essential that the students understand all the relevant maintenance documentation. During the performance of examinations and assessments, the assistance of the translator should be limited to the translation of the questions, but should not provide clarifications or help in relation to those questions.

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## AMC to Part 66 APPENDIX II

### Aircraft Type Practical Experience and On-the-Job Training

#### List of Tasks

##### Time limits/Maintenance checks

100 hour check (general aviation aircraft).

“B” or “C” check (transport category aircraft).

Assist carrying out a scheduled maintenance check i.a.w. AMM.

Review aircraft maintenance log for correct completion.

Review records for compliance with Airworthiness Directives.

Review records for compliance with component life limits.

Procedure for inspection following heavy landing.

Procedure for inspection following lightning strike.

##### Dimensions/Areas

Locate component(s) by zone/station number.

Perform symmetry check.

##### Lifting and Shoring

Assist in:

Jack aircraft nose or tail wheel.

Jack complete aircraft.

Sling or trestle major component.

##### Levelling/Weighing

Level aircraft.

Weigh aircraft.

Prepare weight and balance amendment.

Check aircraft against equipment list.

##### Towing and Taxiing

Prepare for aircraft towing.

Tow aircraft.

Be part of aircraft towing team.

##### Parking and Mooring

Tie down aircraft.

Park, secure and cover aircraft.

Position aircraft in maintenance dock.

Secure rotor blades.

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## Placards and Markings

Check aircraft for correct placards.

Check aircraft for correct markings.

## Servicing

Refuel aircraft.

Defuel aircraft.

Carry out tank to tank fuel transfer.

Check/adjust tire pressures.

Check/replenish oil level.

Check/replenish hydraulic fluid level.

Check/replenish accumulator pressure.

Charge pneumatic system.

Grease aircraft.

Connect ground power.

Service toilet/potable water system.

Perform preflight/daily check.

## Vibration and Noise Analysis

Analyse helicopter vibration problem.

Analyse noise spectrum.

Analyse engine vibration.

## Air Conditioning

Replace combustion heater.

Replace flow control valve.

Replace outflow valve.

Replace safety valve.

Replace vapour cycle unit.

Replace air cycle unit.

Replace cabin blower.

Replace heat exchanger.

Replace pressurisation controller.

Clean outflow valves.

Deactivate/reactivate cargo isolation valve.

Deactivate/reactivate avionics ventilation components.

Check operation of air conditioning/heating system.

Check operation of pressurisation system.

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Troubleshoot faulty system.

## **Auto flight**

Install servos.

Rig bridle cables.

Replace controller.

Replace amplifier.

Replacement of the auto flight system LRUs in case of fly-by-wire aircraft.

Check operation of auto-pilot.

Check operation of auto-throttle/auto-thrust.

Check operation of yaw damper.

Check and adjust servo clutch.

Perform autopilot gain adjustments.

Perform mach trim functional check.

Troubleshoot faulty system.

Check autoland system.

Check flight management systems.

Check stability augmentation system.

## **Communications**

Replace VHF com unit.

Replace HF com unit.

Replace existing antenna.

Replace static discharge wicks.

Check operation of radios.

Perform antenna VSWR check.

Perform Selcal operational check.

Perform operational check of passenger address system.

Functionally check audio integrating system.

Repair coaxial cable.

Troubleshoot faulty system.

## **Electrical Power**

Charge lead/acid battery.

Charge Ni-Cad battery.

Check battery capacity.

Deep-cycle Ni-Cad battery.

Replace integrated drive/generator/alternator.

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Replace switches.

Replace circuit breakers.

Adjust voltage regulator.

Change voltage regulator.

Amend electrical load analysis report.

Repair/replace electrical feeder cable.

Troubleshoot faulty system.

Perform functional check of integrated drive/generator/alternator.

Perform functional check of voltage regulator.

Perform functional check of emergency generation system.

### **Equipment/Furnishings**

Replace carpets.

Replace crew seats.

Replace passenger seats.

Check inertia reels.

Check seats/belts for security.

Check emergency equipment.

Check ELT for compliance with regulations.

Repair toilet waste container.

Remove and install ceiling and sidewall panels.

Repair upholstery.

Change cabin configuration.

Replace cargo loading system actuator.

Test cargo loading system.

Replace escape slides/ropes.

### **Fire protection**

Check fire bottle contents.

Check/test operation of fire/smoke detection and warning system.

Check cabin fire extinguisher contents.

Check lavatory smoke detector system.

Check cargo panel sealing.

Install new fire bottle.

Replace fire bottle squib.

Troubleshoot faulty system.

Inspect engine fire wire detection systems.

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## Flight Controls

Inspect primary flight controls and related components i.a.w. AMM.

Extending/retracting flaps & slats.

Replace horizontal stabiliser.

Replace spoiler/lift damper.

Replace elevator.

Deactivation/reactivation of aileron servo control.

Replace aileron.

Replace rudder.

Replace trim tabs.

Install control cable and fittings.

Replace slats.

Replace flaps.

Replace powered flying control unit.

Replace flat actuator.

Rig primary flight controls.

Adjust trim tab.

Adjust control cable tension.

Check control range and direction of movement.

Check for correct assembly and locking.

Troubleshoot faulty system.

Functional test of primary flight controls.

Functional test of flap system.

Operational test of the side stick assembly.

Operational test of the THS.

THS system wear check.

## Fuel

Water drain system (operation).

Replace booster pump.

Replace fuel selector.

Replace fuel tank cells.

Replace/test fuel control valves.

Replace magnetic fuel level indicators.

Replace water drain valve.

Check/calculate fuel contents manually.

Check filters.

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Flow check system.

Check calibration of fuel quantity gauges.

Check operation feed/selectors.

Check operation of fuel dump/jettison system.

Fuel transfer between tanks.

Pressure defuel.

Pressure refuel (manual control).

Deactivation/reactivation of the fuel valves (transfer defuel, X-feed, refuel).

Troubleshoot faulty system.

## Hydraulics

Replace engine-driven pump.

Check/replace case drain filter.

Replace standby pump.

Replace hydraulic motor pump/generator.

Replace accumulator.

Check operation of shut off valve.

Check filters/clog indicators.

Check indicating systems.

Perform functional checks.

Pressurisation/depressurisation of the hydraulic system.

Power Transfer Unit (PTU) operation.

Replacement of PTU.

Troubleshoot faulty system.

## Ice and rain protection

Replace pump.

Replace timer.

Inspect repair propeller deice boot.

Test propeller de-icing system.

Inspect/test wing leading edge de-icer boot.

Replace anti-ice/deice valve.

Install wiper motor.

Check operation of systems.

Operational test of the pitot-probe ice protection.

Operational test of the TAT ice protection.

Operational test of the wing ice protection system.

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Assistance to the operational test of the engine air-intake ice protection (with engines operating).

Troubleshoot faulty system.

### **Indicating/recording systems**

Replace flight data recorder.

Replace cockpit voice recorder.

Replace clock.

Replace master caution unit.

Replace FDR.

Perform FDR data retrieval.

Troubleshoot faulty system.

Implement ESDS procedures.

Inspect for HIRF requirements.

Start/stop EIS procedure.

Bite test of the CFDIU.

Ground scanning of the central warning system.

### **Landing Gear**

Build up wheel.

Replace main wheel.

Replace nose wheel.

Replace steering actuator.

Replace truck tilt actuator.

Replace gear retraction actuator.

Replace uplock/downlock assembly.

Replace shimmy damper.

Rig nose wheel steering.

Functional test of the nose wheel steering system.

Replace shock strut seals.

Servicing of shock strut.

Replace brake unit.

Replace brake control valve.

Bleed brakes.

Replace brake fan.

Test anti skid unit.

Test gear retraction.

Change bungees.



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Adjust micro switches/sensors.

Charge struts with oil and air.

Troubleshoot faulty system.

Test auto-brake system.

Replace rotorcraft skids.

Replace rotorcraft skid shoes.

Pack and check floats.

Flotation equipment.

Check/test emergency blowdown (emergency landing gear extension).

Operational test of the landing gear doors.

## Lights

Repair/replace rotating beacon.

Repair/replace landing lights.

Repair/replace navigation lights.

Repair/replace interior lights.

Replace ice inspection lights.

Repair/replace logo lights.

Repair/replace emergency lighting system.

Perform emergency lighting system checks.

Troubleshoot faulty system.

## Navigation

Calibrate magnetic direction indicator.

Replace airspeed indicator.

Replace altimeter.

Replace air data computer.

Replace VOR unit.

Replace ADI.

Replace HSI.

Check pitot static system for leaks.

Check operation of directional gyro.

Functional check weather radar.

Functional check doppler.

Functional check TCAS.

Functional check DME.

Functional check ATC Transponder.

Functional check flight director system.

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Functional check inertial nav system.  
 Complete quadrantal error correction of ADF system.  
 Update flight management system database.  
 Check calibration of pitot static instruments.  
 Check calibration of pressure altitude reporting system.  
 Troubleshoot faulty system.  
 Check marker systems.  
 Compass replacement direct/indirect.  
 Check Satcom.  
 Check GPS.  
 Test AVM.

### **Oxygen**

Inspect on-board oxygen equipment.  
 Purge and recharge oxygen system.  
 Replace regulator.  
 Replace oxygen generator.  
 Test crew oxygen system.  
 Perform auto oxygen system deployment check.  
 Troubleshoot faulty system.

### **Pneumatic systems**

Replace filter.  
 Replace air shut off valve.  
 Replace pressure regulating valve.  
 Replace compressor.  
 Recharge dessicator.  
 Adjust regulator.  
 Check for leaks.  
 Troubleshoot faulty system.

### **Vacuum systems**

Inspect the vacuum system i.a.w. AMM.  
 Replace vacuum pump.  
 Check/replace filters.  
 Adjust regulator.  
 Troubleshoot faulty system.

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## **Water/Waste**

Replace water pump.  
 Replace tap.  
 Replace toilet pump.  
 Perform water heater functional check.  
 Troubleshoot faulty system.  
 Inspect waste bin flap closure.

## **Central Maintenance System**

Retrieve data from CMU.  
 Replace CMU.  
 Perform Bite check.  
 Troubleshoot faulty system.

## **Structures**

Assessment of damage.  
 Sheet metal repair.  
 Fibre glass repair.  
 Wooden repair.  
 Fabric repair.  
 Recover fabric control surface.  
 Treat corrosion.  
 Apply protective treatment.

## **Doors**

Inspect passenger door i.a.w. AMM.  
 Rig/adjust locking mechanism.  
 Adjust air stair system.  
 Check operation of emergency exits.  
 Test door warning system.  
 Troubleshoot faulty system.  
 Remove and install passenger door i.a.w. AMM.  
 Remove and install emergency exit i.a.w. AMM.  
 Inspect cargo door i.a.w. AMM.

## **Windows**

Replace windshield.  
 Replace direct vision window.  
 Replace cabin window.

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Repair transparency.

## **Wings**

Skin repair.

Recover fabric wing.

Replace tip.

Replace rib.

Replace integral fuel tank panel.

Check incidence/rig.

## **Propeller**

Assemble prop after transportation.

Replace propeller.

Replace governor.

Adjust governor.

Perform static functional checks.

Check operation during ground run.

Check track.

Check setting of micro switches.

Assessment of blade damage i.a.w. AMM.

Dynamically balance prop.

Troubleshoot faulty system.

## **Main Rotors**

Install rotor assembly.

Replace blades.

Replace damper assembly.

Check track.

Check static balance.

Check dynamic balance.

Troubleshoot.

## **Rotor Drive**

Replace mast.

Replace drive coupling.

Replace clutch/freewheel unit.

Replace drive belt.

Install main gearbox.

Overhaul main gearbox.

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Check gearbox chip detectors.

## **Tail Rotors**

Install rotor assembly.

Replace blades.

Troubleshoot.

## **Tail Rotor Drive**

Replace bevel gearbox.

Replace universal joints.

Overhaul bevel gearbox.

Install drive assembly.

Check chip detectors.

Check/install bearings and hangers.

Check/service/assemble flexible couplings.

Check alignment of drive shafts.

Install and rig drive shafts.

## **Rotorcraft flight controls**

Install swash plate.

Install mixing box.

Adjust pitch links.

Rig collective system.

Rig cyclic system.

Rig anti-torque system.

Check controls for assembly and locking.

Check controls for operation and sense.

Troubleshoot faulty system.

## **Power Plant**

Build up ECU.

Replace engine.

Repair cooling baffles.

Repair cowling.

Adjust cowl flaps.

Repair faulty wiring.

Troubleshoot.

Assist in dry motoring check.

Assist in wet motoring check.

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Assist in engine start (manual mode).

### **Piston Engines**

Remove/install reduction gear.

Check crankshaft run-out.

Check tappet clearance.

Check compression.

Extract broken stud.

Install helicoil.

Perform ground run.

Establish/check reference RPM.

Troubleshoot.

### **Turbine Engines**

Replace module.

Replace fan blade.

Hot section inspection/borescope check.

Carry out engine/compressor wash.

Carry out engine dry cycle.

Engine ground run.

Establish reference power.

Trend monitoring/gas path analysis.

Troubleshoot.

### **Fuel and control, piston**

Replace engine driven pump.

Adjust AMC.

Adjust ABC.

Install carburettor/injector.

Adjust carburettor/injector.

Clean injector nozzles.

Replace primer line.

Check carburettor float setting.

Troubleshoot faulty system.

### **Fuel and control, turbine**

Replace FCU.

Replace Engine Electronic Control Unit (FADEC).

Replace Fuel Metering Unit (FADEC).

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Replace engine driven pump.

Clean/test fuel nozzles.

Clean/replace filters.

Adjust FCU.

Troubleshoot faulty system.

Functional test of FADEC.

### **Ignition systems, piston**

Change magneto.

Change ignition vibrator.

Change plugs.

Test plugs.

Check H.T. leads.

Install new leads.

Check timing.

Check system bonding.

Troubleshoot faulty system.

### **Ignition systems, turbine**

Perform functional test of the ignition system.

Check glow plugs/ignitors.

Check H.T. leads.

Check ignition unit.

Replace ignition unit.

Troubleshoot faulty system.

### **Engine Controls**

Rig thrust lever.

Rig RPM control.

Rig mixture HP cock lever.

Rig power lever.

Check control sync (multi-eng).

Check controls for correct assembly and locking.

Check controls for range and direction of movement.

Adjust pedestal micro-switches.

Troubleshoot faulty system.

### **Engine Indicating**

Replace engine instruments(s).

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Replace oil temperature bulb.

Replace thermocouples.

Check calibration.

Troubleshoot faulty system.

### **Exhaust, piston**

Replace exhaust gasket.

Inspect welded repair.

Pressure check cabin heater muff.

Troubleshoot faulty system.

### **Exhaust, turbine**

Change jet pipe.

Change shroud assembly.

Install trimmers.

Inspect/replace thrust reverser.

Replace thrust reverser component.

Deactivate/reactivate thrust reverser.

Operational test of the thrust reverser system.

### **Oil**

Change oil.

Check filter(s).

Adjust pressure relief valve.

Replace oil tank.

Replace oil pump.

Replace oil cooler.

Replace firewall shut off valve.

Perform oil dilution test.

Troubleshoot faulty system.

### **Starting**

Replace starter.

Replace start relay.

Replace start control valve.

Check cranking speed.

Troubleshoot faulty system.

### **Turbines, piston engines**

Replace PRT.



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Replace turbo-blower.

Replace heat shields.

Replace waste gate.

Adjust density controller.

### **Engine water injection**

Replace water/methanol pump.

Flow check water/methanol system.

Adjust water/methanol control unit.

Check fluid for quality.

Troubleshoot faulty system

### **Accessory gear boxes**

Replace gearbox.

Replace drive shaft.

Inspect magnetic chip detector.

### **APU**

Removal/installation of the APU.

Removal/installation of the inlet guide-vane actuator.

Operational test of the APU emergency shut-down test.

Operational test of the APU.

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## AMC TO Part 66 APPENDIX III

### Evaluation of the competence: assessment and assessors

This Appendix applies to the competence assessment performed by the designated assessors (and their qualifications).

#### 1. What does “competence” mean and areas of focus for assessment

The assessment should aim at measuring the competence by evaluating three major factors associated to the learning objectives:

- (a) Knowledge;
- (b) Skills;
- (c) Attitude.

Generally, knowledge is evaluated by examination. The purpose of this document is not to describe the examination process: this material mainly addresses the evaluation of “skills” and “attitude” after training containing practical elements. Nevertheless, the trainee needs to demonstrate sufficient knowledge to perform the required tasks.

“Attitude” is indivisible from the “skill” as this greatly contributes to the safe performance of the tasks. The evaluation of the competence should be based on the learning objectives of the training, in particular:

- (a) the (observable) desired performance. This covers what the trainee is expected to be able to do and how the trainee is expected to behave at the end of the training;
- (b) the (measurable) performance standard that must be attained to confirm the trainee’s level of competence in the form of tolerances, constraints, limits, performance rates or qualitative statements; and
- (c) the conditions under which the trainee will demonstrate competence. Conditions consist of the training methods, the environmental, situational and regulatory factors.

The assessment should focus on the competencies relevant to the aircraft type and its maintenance including, but not limited to:

- (a) Environmental awareness (act safely, apply safety precautions and prevent dangerous situations);
- (b) Systems integration (demonstrate understanding of aircraft systems interaction – identify, describe, explain, plan, execute);
- (c) Knowledge and understanding of areas requiring special emphasis or novelty (areas peculiar to the aircraft type, domains not covered by Part 66 Appendix I, practical training elements that cannot be imparted through simulation devices, etc.);
- (d) Using reports and indications (the ability to read and interpret);
- (e) Aircraft documentation finding and handling (identify the appropriate aircraft documentation, navigate, execute and obey the prescribed maintenance procedures);
- (f) Perform maintenance actions (demonstrate safe handling of aircraft, engines, components and tools);

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- (g) Aircraft final/close-up and report (apply close up, initiate appropriate actions/follow-up/ records of testing, establish and sign maintenance records/logbooks).

## 2. How to assess

As far as feasible, the objectives of the assessment should be associated with the learning objectives and the passing level; it means that observable criteria should be set to measure the performance and should remain as objective as possible. The general characteristics of effective assessment are: objective, flexible, acceptable, comprehensive, constructive, organised and thoughtful. At the conclusion, the trainee should have no doubt about what he/she did well, what he/she did poorly and how he/she can improve.

The following is a non-exhaustive list of questions that may be posed to assist the assessment:

- (a) What are the success factors for the job?
- (b) What are typical characteristics of a correct behaviour for the task?
- (c) What criteria should be observed?
- (d) What level of expertise is expected?
- (e) Is there any standard available?
- (f) What is the pass mark? For example:
  - “Go-no go” situation;
  - How to allocate points? Minimum amount to succeed;
  - “Must know or execute” versus “Good to know or execute” versus “Don’t expect the candidate to be an expert”.
- (g) Minimum or maximum time to achieve? Use time effectively and efficiently.
- (h) What if the trainee fails? How many times is the trainee allowed to fail?
- (i) When and how should the trainee be prepared for the assessment?
- (j) What proportion of judgment by the instructor out of collaboration with the trainee is needed during the evaluation stage?

The assessment may be:

- (k) diagnostic (prior to a course), formative (reorientate the course on areas where there is a need to reinforce) or summative (partial or final evaluation);
- (l) performed task-by-task, as a group of tasks or as a final assessment.
- (m) One method might be an initial assessment to be performed by the trainee himself/herself, then discussing areas where the perceptions of the trainee’s performance by the assessors differ in order to:
- (n) develop the self-assessment habits;
- (o) make the assessment more acceptable and understandable to both parties.

A “box-ticking” exercise would be pointless. Experience has shown that assessment sheets have largely evolved over time into assessment of groups of “skills” because in practice such things eventually detracted from the training and assessment that it was intended to serve: evaluate at a point of time, encourage and orientate the training needs, improve safety and ultimately qualify people for their duties.

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In addition, many other aspects should be appropriately considered during the assessment process such as stress and environmental conditions, difficulty of the test, history of evaluation (such as tangible progresses or sudden and unexpected poor performance made by the trainee), amount of time necessary to build competence, etc.

All these reasons place more emphasis on the assessor and highlight the function of the organisation's approval.

### 3. Who should assess

In order to qualify, the assessor should:

- (a) Be proficient and have sufficient experience or knowledge in:
  - human performance and safety culture;
  - the aircraft type (necessary to have the certifying staff privileges in case of CRS issuances);
  - training/coaching/testing skills;
  - instructional tools to use;
- (b) Understand the objective and the content of the practical elements of the training that is being assessed;
- (c) Have interpersonal skills to manage the assessment process (professionalism, sincerity objectivity and neutrality, analysis skills, sense of judgement, flexibility, capability of evaluating the supervisor's or instructor's reports, handling of trainee's reactions to failing assessment with the cultural environment, being constructive, etc.);
- (d) Be ultimately designated by the organisation to carry out the assessment.

The roles may be combined for:

- the assessor and the instructor for the practical elements of the Type Rating Training;

or

- the assessor and the supervisor for the On-the-Job Training provided that the objectives associated with each role are clearly understood and that the competence and qualification criteria according to the company's procedures are met for both functions. Whenever possible (depending on the size of the organisation), it is recommended to split the roles (two different persons) in order to avoid any conflicts of interests. When the functions are not combined, the role of each function should be clearly understood.

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