

EUROPEAN MILITARY AIRWORTHINESS REQUIREMENT

EMAR 66 AMC & GM

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NOTE:

1. Where the content of any of the paragraphs from the previous document has been amended, this is indicated by the use of a 'sidebar' in the margin.
2. This EMAR AMC/GM relies on definitions laid down in EMAD 1. The Forms referred to in this document can be found in the EMAR Forms document.
3. This EMAR AMC & GM relies on the EASA "Easy Access Rules for Continuing Airworthiness (Regulation (EU) No 1321/2014)" published in July 2024.

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ACCEPTABLE MEANS OF COMPLIANCE

SECTION A - TECHNICAL REQUIREMENTS

GM 66.A.3 MAML categories and subcategories

Individual Military Aircraft Maintenance Licence (MAML) holders need not be restricted to a single category. Provided that each qualification requirement is satisfied, any combination of categories may be granted.

GM 1 66.A.5 Aircraft groups

NOT APPLICABLE.

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 logbook of maintenance experience is desirable and some NMAAs may require such a logbook to be kept. It is acceptable to cross-refer in the EMAR Form 19 to other documents containing information on maintenance.

2. Applicants claiming the maximum reduction in EMAR 66.A.30(a) total experience based upon having successfully completed EMAR 147.A.200 approved basic training should include the EMAR 147 Certificate of Recognition for approved basic training.

3. Applicants claiming reduction in EMAR 66.A.30(a) total experience based upon having successfully completed technical training in an organisation or entity recognised by the NMAA as an approved Maintenance Training Organisation should include the relevant certificate of successful completion of training. Where the technical training was completed in another organisation (for example a CAA or EASA approved Maintenance Training Organisation), then advice should be sought from the NMAA to ensure the training received is acceptable to the NMAA.

GM 66.A.10(a) Application

NOT APPLICABLE.

GM1 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.

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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);
- Integrated Modular Avionics (IMA);
- On-Board Maintenance Systems;
- Information Systems;
- Fly-by-Wire Systems (related to system 27 "Flight Controls");
- Fibre Optic Control Systems.

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

Armament, rescue and escape systems and other military-specific systems means systems associated with the EMAR 66 Appendix I OJT TASK SELECTION. Examples of armament, rescue and escape systems and other military-specific systems include the following:

- weapons;
- weapons release/launch mechanisms;
- ejection seats;
- electronic warfare.

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: refer to AMC1 145.A.10.

Base Maintenance: refer to AMC1 145.A.10.

2. NOT APPLICABLE.
3. NOT APPLICABLE.
4. NOT APPLICABLE.
5. The category C licence permits certification of 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 support staff, as appropriate, have signed for the maintenance tasks under their respective specialisation. The principal function of category C certifying staff is to ensure that all required maintenance has been called up and signed off by category B1, B2 support staff, as appropriate, before issue of the certificate of release to service. Only category C personnel who also hold category B1 or B2 qualifications may perform both roles in base maintenance.

AMC 66.A.20(a)4 Privileges

NOT APPLICABLE.

AMC 66.A.20(b)2 Privileges

The 6 months maintenance experience in the preceding 2-year period 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 Organisation:

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

The 6-month period can be replaced by 100 days of maintenance experience in accordance with the privileges, whether they have been performed within an approved organisation.

2. Nature of the experience:

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

- Servicing;
- Inspection;
- Operational and functional testing;
- Troubleshooting;
- Repairing;
- Modifying;
- Changing components;
- Supervising these activities;

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- Releasing aircraft to service.

For Category A MAML holders, the experience should include exercising the privileges, by means of performing tasks related to the authorisation 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 and B2, for every military aircraft included in the authorisation the experience should be on that particular aircraft or on a similar aircraft within the same licence (sub)category. Two aircraft can be considered to be similar when they have similar technology, construction and comparable systems, which means equally equipped, for example, with the following (as applicable to the MAML 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
- Weapon systems (including aircrew assisted escape systems and weapons carried); and
- Structure (manufactured of metal or composite).

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

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

The experience should be documented in an individual logbook or in any other recording system approved by the NMAA (which may be an automated / computerised one) containing the following data:

- Date;
- Aircraft type;
- Aircraft identification, i.e. registration;
- S1000D Chapter (optional);
- Operation performed e.g. 100 flight hours check, main landing gear wheel change, engine oil check and complement, Service Bulletin (or national equivalent) embodiment, troubleshooting, structural repair, ejection seat change...;
- Type of maintenance, i.e. base, line;
- Type of activity, i.e. perform, supervise, release;

- Subcategory used: A1, A2, A3, A4, B1.1, B1.2, B1.3, B2 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 EMAR 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 military aircraft rating (for example, 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 MAML 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 MAML and ratings.

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

- Work being carried out on a type/model/series for which the technical design and maintenance techniques have significantly evolved from the original model used in the military aircraft type training/On-the-Job Training.
- Specific technology, options and configurations which may not have been covered by the military aircraft type training/On-the-Job Training.
- Changes in the basic knowledge requirements of Appendix I to EMAR 66 not requiring re-examination of existing MAML holders (grandfathered privileges).
- 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 an EMAR 66 MAML with limitations obtained through conversion of national qualifications (EMAR 66.A.70), where such limitations are going to be lifted after performing the corresponding basic knowledge examinations. In this case, the military aircraft type ratings endorsed in the MAML 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 an EMAR 66 MAML 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 MAML holder is able to:
 - read and understand the instructions and technical manuals used for the performance of maintenance;

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- 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 MO procedures;
 - communicate at such a level so 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 EMAR 66.
2. Knowledge gained and examinations passed during previous experiences, for example in civilian aviation and apprenticeships, may be credited where the NMAA is satisfied that such knowledge and examinations are equivalent to that required by Appendix I to EMAR 66.

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

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

GM 66.A.25(b) Basic knowledge requirements

NOT APPLICABLE.

GM 66.A.25(d) Basic knowledge requirements

Where the relevant basic knowledge requirements remain unchanged, no additional training is required for credit renewal.

AMC1 66.A.30(a) Basic experience requirements

1. Maintenance experience on operating military aircraft:
 - means the experience of being involved in maintenance tasks on aircraft which are being operated by military operating organisations as relevant to the licence category/subcategory;
 - should cover a wide range of tasks in terms of length, complexity and variety;
 - aims at gaining sufficient experience in the real environment of maintenance as opposed to only the training school environment;
 - may be gained within different types of maintenance organisations (EMAR 145, legacy maintenance organisations, etc.);

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- may be combined with EMAR 147 approved training (or other training approved by the NMAA) so that periods of training can be intermixed with periods of experience, similar to an apprenticeship;
 - may be full-time or part-time, either as a professional or on a voluntary basis;
2. A skilled worker is a person who has successfully completed a training, acceptable to the NMAA, involving the manufacture, repair, overhaul or inspection of mechanical, electrical, electronic equipment or where applicable military specific equipment. The training would include the use of tools and measuring devices.
3. In the case of an applicant for a licence, including several categories/subcategories, it is acceptable to combine the periods of experience as long as there is sufficient experience for each category/subcategory during the required period. Examples:
- Application for a B1.1 (turbine aeroplanes) + B1.3 (turbine helicopters): EMAR 66 requires 5 years of experience for B1.1 and 5 years of experience for B1.3 for an applicant with no relevant previous technical training.
 - It is not acceptable to combine the experience in a single 5-year period where the applicant has been working for 3 years on turbine aeroplanes and 2 years on turbine helicopters.
 - However, it is acceptable to combine the experience in a single 5-year period if the applicant has been working for 5 years on turbine aeroplanes and turbine helicopters (for example, aeroplanes in the morning, helicopters in the afternoon, or a few days every week on aeroplanes and a few days every week on helicopters).
 - Application for a B1.1 (turbine aeroplanes) + B2 (avionics): EMAR 66 requires 5 years of experience for B1.1 and 5 years of experience for B2 for an applicant with no relevant previous technical training.
 - It is not acceptable to combine the experience in a single 5-year period where the applicant has been working for 3 years on turbine aeroplanes (with no avionics work) and 2 years on avionics systems.
 - However, it is acceptable to combine the experience in a single 5-year period if the applicant has been working for 5 years on structures, powerplant, mechanical and electrical systems and avionics (for B1.1 tasks in the morning, B2 tasks in the afternoon, or a few days every week for B1.1 tasks and a few days every week for B2 tasks).
 - Application for a B1.1, B1.2, B1.3, B1.4 and B2: EMAR 66 requires 5 years of experience for B1.1, B1.3 and B2, and 3 years of experience for B1.2 and B1.4 for an applicant with no relevant previous technical training.
 - In this case, it is very unlikely that the experience for each category/subcategory would be sufficient.
4. For a category C applicant that holds an academic degree, the participation in the performance of maintenance tasks on operating aircraft may include maintenance, maintenance planning, compliance monitoring function, record-keeping, spare parts management and engineering development.

‘Experience in working in a military aircraft maintenance environment on a representative selection of tasks directly associated with aircraft maintenance’ means experience gained at an organisation that is approved in accordance with EMAR 145, EMAR CAMO or

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similar, or experience in performing comparable work that is directly related to the continuing airworthiness of aircraft within a NMAA.

'Including 6 months of participation in the performance of base maintenance tasks' on operating aircraft means experience gained through the active participation and/or observation in base maintenance checks at maintenance organisations.

If the applicant has acquired experience on operating military aircraft, the corresponding category C licence should be issued.

While it is strongly recommended that the participation in the performance of maintenance on aircraft should be at the level required for the issue of a B1 or B2 licence, the objective of the required experience is to gain insight into the performance of base maintenance. The applicant for an academic category C licence should be aware of the type of maintenance carried out before the signature of support staff and understand their roles in the release-to-service process of base maintenance. It is encouraged that the future category C licence holder participates in both simple and complex tasks during their experience in base maintenance and gains insight in some aircraft critical systems.

In the case presented in EMAR 66.A.30(e), for the required experience gained outside the military regulatory framework, at least 1 year should be in an EMAR 145 environment, including participation in the performance of base maintenance tasks for 6 months.

GM1 66.A.30(a) Basic experience requirements

The table below summarises the basic experience requirements for the category C licence.

From:	To:	Category C
Holder of a licence with B1.1, B1.3 or B2		3 years of experience as support staff, or both support staff and certifying staff, in operating military aircraft, including 12 months as support staff in base maintenance.
Holder of a licence with B1.2 or B1.4		5 years of experience as support staff, or both support staff and certifying staff, in operating military aircraft, including 12 months as support staff in base maintenance.
Holder of an academic degree, in a relevant technical discipline, issued by a university or any other higher educational institution recognised by the NMAA		3 years of experience in working in an aircraft maintenance environment, on a representative selection of tasks that are directly associated with aircraft maintenance of operating military aircraft, including 6 months of participation in the performance of base maintenance tasks on operating military aircraft.

Within the meaning of [AMC1 66.A.30\(a\)](#), the term “engineering” refers to activities performed within an EMAR 145 organisation or within a CAMO that are associated with repairs and modifications (which may or may not need to be further processed for approval) in accordance with the MOE.

Where the practical element of the military aircraft type training is performed concurrently with the OJT element and both are performed on the same military aircraft type and in a real

maintenance environment, this can count towards the experience requirements detailed in EMAR 66.A.30.

AMC 66.A.30(c) Basic experience requirements

NOT APPLICABLE.

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

To be considered as 'recent maintenance experience', at least 50% of the required 12-month 'recent maintenance experience' should be gained within the 12-month period prior to the date of application for the MAML. The remainder of the 'recent maintenance 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 EMAR 66.A.30 must be obtained within the 10 years prior to the application as required by EMAR 66.A.30(f).

AMC1 66.A.30(e) Basic experience requirements

- (a) If the NMAA has established that the experience gained outside an aircraft maintenance organisation approved in accordance with EMAR 145 is equivalent to that required by EMAR 66, the minimum additional experience in aircraft maintenance organisation(s) that is (are) approved in accordance with EMAR 145 should be determined by the NMAA.
- (b) Experience in aircraft maintenance gained outside a military aircraft maintenance organisation(s) that is (are) approved in accordance with EMAR 145 may include experience in aircraft maintenance gained in the civil environment, other nation's armed forces, coast guards, police, etc., or in aircraft manufacturing.

GM 66.A.40 Continued validity of the MAML

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

GM1 66.A.45 Endorsement with military aircraft ratings

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

Note: OJT means "On-the-Job Training" (see Appendix III to EMAR 66, Section 6).

<u>Military aircraft rating requirements</u>		
Aircraft	B1 / B2 MAML	C MAML
All military aircraft are considered to be complex motor-powered aircraft	TYPE RATING Type Training: - Theory + examination - Practical + assessment PLUS OJT (for first aircraft in licence subcategory.)	TYPE RATING Type Training: - Theory + examination

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

A military aircraft rating includes all the aircraft models/series as accepted by the NMAA.

When a person already holds a military aircraft rating on the licence and such rating is amended in order to include additional models/series, the impact of the change should be properly assessed to decide if there is a need to amend the rating in the licence. However, it is the responsibility of the licence holder and, if applicable, the maintenance organisation where he/she is employed to comply with EMAR 66.A.20(b)3, EMAR 145.A.35(a), as applicable, before he/she exercises certification privileges.

AMC 66.A.45(d);(e)3;(f)1;(g)1;(h) Endorsement with military aircraft ratings

NOT APPLICABLE.

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

NOT APPLICABLE.

GM1 66.A.45(h)(ii) Endorsement with military aircraft ratings

NOT APPLICABLE.

AMC 66.A.50(a) Limitations

In case of partial qualification resulting from missing modules, the MAML should incorporate the relevant limitations in accordance with EMAR 66.A.50.

AMC 66.A.50(b) Limitations

NOT APPLICABLE.

AMC 66.A.52 Extensions for Military Specific Systems

In case of extended qualification resulting from additional modules or sub-modules, the MAML should incorporate the relevant extensions in accordance with EMAR 66.A.52 and EMAR 66.B.116.

AMC 66.A.55 Evidence of qualification

For particular cases where a personnel exercising certification privileges as well as support staff would have return the original of his MAML to the NMAA for amendment and would be controlled by an official of the NMAA a copy/evidence of the licence owned is acceptable.

GM 66.A.70 Conversion provisions

1. As described in EMAR 66.A.70, the conversion provisions apply to the holder of a valid certifying staff qualification prior to a date established in national regulation. The sentence 'the holder of a valid certifying staff qualification' means any person who had a valid qualification allowing that person the performance of activities identical to the privileges of 'certifying staff' contained in continuing airworthiness EMARs. 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 with 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. Since an airworthiness review (or equivalent term used in the national systems) 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 EMAR 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.

2. The conversion applies to "certifying staff qualifications" such as, for example:
 - holding a pre-existing national licence or equivalent (or completed the process to obtain such a national licence);
 - having completed a qualification process defined by the NMAA, or equivalent body under the national system, to become certifying staff;
 - having completed the qualification requirements for certifying staff within a MO, as defined in its 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 or national equivalent with a wider scope than the scope of the organisation where he/she is employed;
- The person is working outside the military aviation environment or is temporarily on leave due to different reasons (medical, personal, etc.).

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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. NOT APPLICABLE.
4. Although only those “certifying staff qualifications” gained prior to the introduction of EMAR 66 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 (sub)category (with any applicable limitations).

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 EMAR 66 Appendix I and II, all the modules/subjects corresponding to the B1 licence except for electrical power systems. This person would be issued an EMAR 66 MAML in the B1 category with a limitation (exclusion) on electrical power systems.

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

GM 66.A.70(d) Conversion provisions

NOT APPLICABLE.

SECTION B - PROCEDURES FOR NATIONAL MILITARY AIRWORTHINESS AUTHORITIES

GM1 66.B.2 Means of compliance

ALTERNATIVE MEANS OF COMPLIANCE — GENERAL

- (a) NOT APPLICABLE.
- (b) AltMoC used by a NMAA may also be used by other NMAs only if processed again in accordance with EMAR 66.B.2.
- (c) AltMoC issued by the NMAA may cover the following cases:
 - AltMoC to be used by organisations under the oversight of the NMAA and made available to these organisations;
 - AltMoC to be used by the NMAA itself to discharge its responsibilities.

AMC1 66.B.2(b);(c) Means of compliance

PROCESSING THE ALTERNATIVE MEANS OF COMPLIANCE

To meet the objective of EMAR 66.B.2 (b):

- (a) the NMAA should establish the means to consistently evaluate over time that all the AltMoC used by itself or by the organisations under its oversight allow for the establishment of compliance with EMAR 66;
- (b) if the NMAA issues AltMoC for itself or for the organisations under its oversight, it should:
 - (1) make them available to all relevant organisations;
 - (2) NOT APPLICABLE.
 - (3) record them in accordance with EMAR 66.B.20, including an assessment demonstrating that the AltMoC reaches an acceptable level of safety.
- (c) NOT APPLICABLE.

GM1 66.B.2(b);(c) Means of compliance

CASE WHERE EMAR 66 HAS NO CORRESPONDING AMC

When there is no AMC for a certain requirement, the NMAA may choose to develop national guides or other types of documents to help the organisations under its oversight in complying with EMAR 66.

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 NMAA (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.

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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 EMAR 66.B.20.

AMC 66.B.100 Procedure for the issue of a MAML by the NMAA

1. Applicants claiming the maximum reduction in EMAR 66.A.30(a) total experience based upon successful completion of an EMAR 147.A.200 approved basic training course should include the EMAR 147 certificate of recognition for approved basic training.
2. Applicants claiming reduction in EMAR 66.A.30(a) total experience based upon successful completion of training considered relevant by the NMAA as a skilled worker in a technical trade should include the relevant certificate of successful completion of training.
3. Applicants claiming credit against the EMAR 66.A.30(a) total experience requirement by virtue of EMAR 66.A.30(e) non-military aircraft maintenance experience may only be granted such credit where the NMAA has recognised such non-military aircraft maintenance experience. The NMAA in recognising non-military aircraft maintenance experience should have specified who within the non-military 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 that NMAA specified person in accordance with the conditions specified by the NMAA.
4. The NMAA should check that the experience record satisfies the above paragraphs in terms of content and the countersigning signature.

AMC 66.B.100 to 115

Aircraft type endorsement should use the type ratings as decided by the NMAA.

GM 66.B.100 Procedure for the issue of a MAML by the NMAA

Category A licences should be issued with a subcategory without type ratings.

Category B1, B2 and C licences may be issued without a type rating.

AMC 66.B.105 Procedure for the issue of a MAML via a Maintenance Organisation approved in accordance with EMAR 1451. The maintenance organisation approved under EMAR 145 should include the procedure in the MOE (chapter 3.21) and this procedure should be audited by the NMAA in accordance with the EMAR 145 oversight planning cycle. This procedure should include a limitation stating that it is only applicable to the case where the NMAA for the EMAR 145 approval and for the EMAR 66 MAML is the same.

2. The EMAR 145 organisation should check that the experience records have been properly countersigned.
3. The MO approved under EMAR 145 may keep the experience record of applicants in a different form from that of application EMAR Form 19 but such different form or manner should be acceptable to the NMAA.

AMC 66.B.110 Procedure for the change of a MAML to include an additional basic category or subcategory

In the case of computer-generated MAMLs, the MAML should be reissued.

AMC1 66.B.115 Procedure for the change of a MAML to include a military aircraft rating or to remove limitations

- (a) Where the type training has not been conducted by an EMAR 147 organisation (EMAR 66.B.130 refers), there should be supporting documents that:
- the type training has been accepted by the NMAA; and
 - the applicant has completed the elements of the type training; and
 - the trainee has been successfully examined/assessed.
- (b) Military aircraft type training may be subdivided in airframe and/or powerplant and/or avionics/electrical systems and/or military specific/weapons type training courses.
1. Airframe type training course means a type training course including all relevant aircraft structure and electrical and mechanical systems excluding the powerplant.
 2. Powerplant type training course means a type training course on the bare engine, including the build-up to a quick engine change unit.
 3. The interface of the engine/airframe systems should be addressed by either airframe or powerplant type training course. In some cases, 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.
 4. Avionics/electrical systems type training course means type training on avionics and electrical systems covered by but not necessarily limited to systems 22, 23, 24, 25, 27, 31, 33, 34, 42, 44, 45, 46, 73 and 77 or equivalent.
- (c) For the acceptance of the OJT tasks and programme, the licensing NMAA should develop procedures compliant with Section 6 of Appendix III to EMAR 66.

In the case where the licensing NMAA is different from the competent authority of the maintenance organisation which provides the OJT, the licensing NMAA may take into consideration the fact that the maintenance organisation may already have the OJT programme accepted by their own competent authority (directly approved or through Chapter 3.20 of the MOE, as described in AMC1 145.A.70(a)).

AMC 66.B.120 Procedure for the renewal of a MAML validity

NOT APPLICABLE.

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

In the case of type training for aircraft:

1. The procedure for the direct approval of type training courses by the NMAA 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 EMAR 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 EMAR 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 NMAA is going to audit the proper performance of the approved course.
 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 NMAA

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 for the maintenance record, which is why only a few essay questions are required.
3. NOT APPLICABLE.
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 MCQs:

- (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 military aircraft types should not be asked in a basic training 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 $\alpha = 12^\circ$.

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- (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 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 $\sqrt{10}$ then the question should specify the approximate value of $\sqrt{10}$.
- (k) Questions should be in accordance with EMAR 66 examination syllabus (Appendix I and Appendix III).

6. Essay question generation:

- (a) The purpose of the essay is to allow the NMAA 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 military aviation environment. The essay examination also allows to assess, 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 any A or B MAML categories or subcategories and comply with the following general guidelines:
 - the question topic selected should be generic, applicable to mechanical as well as avionic MAML categories and have a common technical difficulty level as indicated in EMAR 66, Appendix I;
 - cover technology applicable to most areas of military aircraft maintenance;
 - reflect common working practices;
 - not be type or manufacturer specific and avoid 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.

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- (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 should 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 helicopter system may not be acceptable for a typical fighter aircraft.
 - 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.
 - The security classification of any military system must be considered when scoping a question.
- Variations on alternative possible answers which have not been thought of may have to be taken into 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 answer 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 should 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 military regulations if applicable. Excessive reference to the need for Aircraft Maintenance Manual referral or safety checks may be considered wasteful.
- (i) The answer 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.

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- (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 should start in the beginning and has a 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 be 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

NOT APPLICABLE.

AMC 66.B.305(a) Conversion report for licences or other qualifications

1. Conversion reports prepared on the basis of EMAR 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 EMAR 66 MAML qualification (i.e. the EMAR 66 qualification requirements), which should be performed on the basis of a detailed analysis of the national and EMAR 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 or extension on the EMAR 66 MAML (see EMAR 66.A.50 and EMAR 66.A.52).
2. NOT APPLICABLE.

GM 66.B.305(b)3 Conversion report for licences or other qualifications

NOT APPLICABLE.

AMC 66.B.310(a) Conversion report for approved Maintenance Organisations authorisations

1. Conversion reports prepared on the basis of EMAR 66.A.70(c) should include a comparison between the qualification required for each type of organisation authorisation and the scope of the EMAR 66 MAML qualification, which should be performed on the basis of a detailed analysis of the organisation and EMAR 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 or extension on the EMAR 66 MAML (EMAR 66.A.50 and EMAR 66.A.52 refer).

2. NOT APPLICABLE.

GM 66.B.310(b)3 Conversion report for approved maintenance organisations authorisations

NOT APPLICABLE.

GM1 66.B.400(d) General

NOT APPLICABLE.

GM 66.B.410 Examination credit validity

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

AMC1 Appendix I — Basic Knowledge Requirements Section 2**MODULARISATION****MODULE 1 — MATHEMATICS**

MODULE 1 — MATHEMATICS	LEVEL	
	A1	B1
	A2	B2
	A3	
	A4	
1.1 Arithmetic Arithmetical terms and signs, methods of multiplication and division, fractions and decimals, factors and multiples, weights, measures and conversion factors, ratio and proportion, averages and percentages, areas and volumes, squares, cubes, square and cube roots.	1	2
1.2 Algebra (a) Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions; (b) Linear equations and their solutions; Indices and powers, negative and fractional indices; Binary and other applicable numbering systems; Simultaneous equations and second-degree equations with one unknown; Logarithms.	1	2
	-	1
1.3 Geometry (a) Simple geometrical constructions; (b) Graphical representation: nature and uses of graphs, graphs of equations/functions; (c) Simple trigonometry: trigonometrical relationships, use of tables and rectangular and polar coordinates.	-	1
	2	2
	-	2

MODULE 2 — PHYSICS

MODULE 2 — PHYSICS	LEVEL	
	A1	B1
	A2	B2
	A3	B2
	A4	
2.1 Matter Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid, and gaseous; Changes between states.	1	2
2.2 Mechanics 2.2.1 Statics Forces, moments and couples, representation as vectors; Centre of gravity; Elements of theory of stress, strain, and elasticity: tension, compression, shear, and torsion; Nature and properties of solid, fluid, and gas matter; Pressure and buoyancy in liquids (barometers)	1	2
2.2.2 Kinetics Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal/centripetal forces); Periodic motion: pendular movement; Simple theory of vibration, harmonics, and resonance; Velocity ratio, mechanical advantage, and efficiency.	1	2
2.2.3 Dynamics (a) Mass; Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency; (b) Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature and effects, coefficient of friction (rolling resistance).	1	2
	1	2
2.2.4 Fluid dynamics (a) Specific gravity and density; (b) Viscosity, fluid resistance, effects of streamlining;	2	2
	1	2

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Effects of compressibility on fluids; Static, dynamic, and total pressure: Bernoulli's Theorem, venturi.		
2.3 Thermodynamics (a) Temperature: thermometers and temperature scales (Celsius, Fahrenheit and Kelvin); definition of heat;	2	2
(b) Heat capacity, specific heat; Heat transfer: convection, radiation and conduction; Volumetric expansion; First and second law of thermodynamics; Gases: ideal gases laws; specific heat at constant volume and constant pressure, work done by expanding gas; Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps; Latent heats of fusion and evaporation, thermal energy, heat of combustion.	1	2
2.4 Optics (Light) Nature of light; speed of light; Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fibre optics.	-	2
2.5 Wave motion and sound Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.	-	2

MODULE 3 — ELECTRICAL FUNDAMENTALS

MODULE 3 — ELECTRICAL FUNDAMENTALS	LEVEL	
	A1	B1
	A2	B2
	A3	B2
	A4	
3.1 Electron theory Structure and distribution of electrical charges within atoms, molecules, ions, and compounds; Molecular structure of conductors, semiconductors, and insulators.	1	1
3.2 Static electricity and conduction Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's law; Conduction of electricity in solids, liquids, gases and in vacuum.	1	2
3.3 Electrical terminology The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	1	2
3.4 Generation of electricity Production of electricity by the following methods: light, heat, friction, pressure, chemical reaction, magnetism, and motion.	1	1
3.5 Sources of DC electricity Construction and basic chemical reaction of primary cells, secondary cells, lead acid cells, nickel cadmium cells, lithium cells, nickel cells and other alkaline cells; Cells connected in series and in parallel; Internal resistance and its effect on a battery; Construction, materials, and operation of thermocouples; Operation of photocells.	1	2
3.6 DC circuits Ohm's law, Kirchhoff's voltage, and current laws; Calculations using the above laws to find resistance, voltage, and current; Significance of the internal resistance of a supply.	1	2

3.7 Resistance/Resistor (a) Resistance Specific resistance; Calculation of total resistance using series, parallel and series–parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge. (b) Resistor Positive and negative temperature coefficient conductance; Resistor colour code, values and tolerances, preferred values, wattage ratings; Resistors in series and in parallel; Fixed resistors, stability, tolerance and limitations, methods of construction; Variable resistors, thermistors, voltage-dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge.	-	2
	-	1
3.8 Power Power, work, and energy (kinetic and potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work, and energy.	-	2
3.9 Capacitance/Capacitor Operation and function of a capacitor; Factors that affect the capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction, and function; Capacitor colour-coding; Calculations of capacitance and voltage in series and in parallel circuits; Exponential charge and discharge of a capacitor, time constants; Testing of capacitors.	-	2
3.10 Magnetism (a) Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnet construction and principles of operation; Handclasp rules to determine magnetic field around current-carrying conductor. (b) Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.	-	2
	-	2

3.11 Inductance/Inductor Faraday's law; Action of inducing a voltage in a conductor that moves in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect that the rates of change of primary current and mutual inductance have on induced voltage; Factors that affect mutual inductance: number of turns in the coil, physical size of the coil, permeability of the coil, position of coils with respect to each other; Lenz's law and polarity determining rules; Back EMF, self-induction; Saturation point; Principal uses of inductors.	-	2
3.12 DC motor/generator theory Basic motor and generator theory; Construction and purpose of components in a DC generator; Operation of and factors that affect the output and direction of the current in DC generators; Operation of and factors that affect the output power, torque, speed, and direction of rotation of DC motors; Series-wound, shunt-wound and compound motors; Starter generator construction.	-	2
3.13 AC theory Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak-to-peak current values and calculations of these values in relation to voltage, current and power; Triangular/Square waves; Single-phase/Three-phase principles.	1	2
3.14 Resistive (R), capacitive (C) and inductive (L) circuits Phase the relationship of voltage and current in L, C and R circuits, parallel, series and series-parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power, and reactive power calculations.	-	2
3.15 Transformers Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Line and phase voltages and currents;	-	2

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Power in a three-phase system; Primary and secondary current, voltage, turn ratio, power, efficiency; Auto-transformers.		
3.16 Filters Operation, application, and uses of the following filters: low pass, high pass, band pass, band stop.	-	1
3.17 AC generators Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single-phase, two-phase, and three-phase alternators; Three-phase star and delta connection advantages, and uses; Permanent magnet generators.	-	2
3.18 AC motors Construction, principles of operation and characteristics of: AC synchronous and induction motors both single-phase and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, shaded or split pole.	-	2

MODULE 4 — ELECTRONICS FUNDAMENTALS

MODULE 4 — ELECTRONICS FUNDAMENTALS	LEVEL		
	A1	B1	B2
	A2		
	A3		
	A4		
4.1 Semiconductors 4.1.1 Diodes (a) Description and characteristics Diode symbols; Diode characteristics and properties; Diodes in series and in parallel; Materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; P–N junction in a semiconductor, development of a potential across a P–N junction in unbiased, forward-biased and reverse-biased conditions; Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; Main characteristics and use of silicon-controlled rectifiers (thyristors), light-emitting diodes (LEDs), photo-conductive diodes, rectifier diodes.	-	2	2
(b) Operation and function Operation and function of diodes in the following circuits: clippers, clampers, full- and half-wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed operation and characteristics of the following devices: silicon-controlled rectifier (thyristor), light-emitting diode (LED), Schottky diode, photo-conductive diode, varactor diode, varistor, rectifier diodes, Zener diode; Functional testing of diodes.	-	-	2
4.1.2 Transistors (a) Description and characteristics Transistor symbols; Component description and orientation; Transistor characteristics and properties.	-	1	2
(b) Construction and operation Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors; Basic appreciation of other transistor types, including types of FET and their uses; Application of transistors: amplifier classes (A, B, C); Simple circuits including bias, decoupling, feedback and stabilisation; Multistage circuit principles: cascades, push–pull, oscillators, multivibrators, flip-flop circuits;	-	-	2

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Operation and amplifier stages connecting methods: resistive, capacitive, direct, inverting, non-inverting and adding.			
4.1.3 Integrated circuits			
(a) Description and operation of logic circuits and linear circuits/operational amplifiers;	-	1	2
(b) Introduction to the operation and function of an operational amplifier used as: an integrator, a differentiator, a voltage follower, a comparator; Advantages and disadvantages of positive and negative feedback.	-	-	2
4.2 Printed circuit boards Description and use of printed circuit boards.	-	1	2
4.3 Servomechanisms			
(a) Principles Understanding of the following principles: open- and closed-loop systems, servomechanism, feedback, follow-up, null, overshoot, damping, deadband, hunting, proximity switches, analogue transducers, synchro systems and components, digital tachometers and encoders, inductance, and capacitance transmitters;	-	1	2
(b) Construction operation and use of the following synchro-system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Construction, operation and use of servomechanism and PID controller; Fault-finding of servo defects, reversal of synchro leads, hunting.	-	-	2

MODULE 5 — DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS

MODULE 5 — DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS	LEVEL		
	A1	B1	B2
	A2		
	A3		
	A4		
5.1 Electronic instrument systems Typical arrangements of systems and cockpit layout of electronic instrument systems	1	1	1
5.2 Numbering systems Numbering systems: binary, octal, and hexadecimal; Demonstration of conversions between the decimal and binary systems, octal and hexadecimal systems and vice versa.	-	1	2
5.3 Data conversion Analogue data, Digital data; Operation and application of analogue-to-digital and digital-to-analogue converters, inputs and outputs, limitations of various types.	-	1	2
5.4 Data buses Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications; Aircraft network/Ethernet.	-	2	2
5.5 Logic circuits (a) Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams. (b) Interpretation of logic diagrams.	-	2	2
	-	-	2
5.6 Basic computer structure (a) Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM); Computer technology (as applied in aircraft systems). (b) Computer operation, layout, and interface of the major components in a microcomputer, including their associated bus systems; Information contained in single- and multi-address instruction words; Memory-associated terms; Operation of typical memory devices; Operation, advantages, and disadvantages of the various data storage systems.	1	2	2
	-	-	2
5.7 Microprocessors	-	-	2

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Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.			
5.8 Integrated circuits Operation and use of encoders and decoders; Function of encoder types.	-	-	2
5.9 Multiplexing Operation, application and identification in logic diagrams of multiplexers and demultiplexers.	-	-	2
5.10 Fibre optics Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; Fibre optic data bus; Fibre-optic-related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in aircraft systems.	-	1	2
5.11 Electronic displays Principles of operation of common types of displays used in modern aircraft, including cathode-ray tubes (CRTs), light-emitting diodes (LEDs) and liquid crystal displays (LCDs).	1	2	2
5.12 Electrostatic-sensitive devices Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component, and personnel antistatic protection devices.	1	2	2
5.13 Software management control Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programs.	-	2	2
5.14 Electromagnetic environment Influence of the following phenomena on maintenance practices for electronic systems: EMC — Electromagnetic Compatibility, EMI — Electromagnetic Interference, HIRF — High-Intensity Radiated Field, Lightning / lightning protection.	-	2	2
5.15 Typical electronic/digital aircraft systems General arrangement of typical electronic/digital aircraft systems and associated BITE (Built-In Test Equipment), such as: ACARS — ARINC Communication and Addressing and Reporting System,			

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FBW — Fly-by-Wire, FMS — flight management system, IRS — inertial reference system; ECAM — Electronic Centralised Aircraft Monitoring, EICAS — engine indication and crew alerting system, EFIS — electronic flight instrument system, GNSS — global navigation satellite system, TCAS — traffic alert collision avoidance system, Integrated Modular Avionics, Cabin Systems, Information Systems.	1	1	1
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MODULE 6 — MATERIALS AND HARDWARE

MODULE 6 — MATERIALS AND HARDWARE	LEVEL		
	A1	B1	B2
	A2		
	A3		
	A4		
6.1 Aircraft materials — ferrous			
(a) Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels.	1	2	1
(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	-	1	1
(c) Repair and inspection procedures for ferrous materials, structures, and airframes.	-	2	1
6.2 Aircraft materials — non-ferrous			
(a) Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials.	1	2	1
(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	-	1	1
(c) Repair and inspection procedures for non-ferrous materials, structures, and airframes.	-	2	1
6.3 Aircraft materials — composite and non-metallic			
6.3.1 Composite and non-metallic materials other than wood and fabric			
(a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents.	1	2	2
(b) Detection of defects/deterioration in composite and non-metallic materials.	1	2	-
(c) Repair of and inspection procedures for composite and non-metallic materials, structures, and airframes.	-	2	1
6.3.2 Wooden structures			
Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in aeroplanes; Preservation and maintenance of wooden structures; Types of defects in wood material and wooden structures; Detection of defects in wooden structures; Repair of wooden structures.	-	-	-
6.3.3 Fabric covering	-	-	-

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Characteristics, properties and types of fabrics used in aeroplanes; Inspection methods for fabrics; Types of defects in fabrics; Repair of fabric covering.			
6.4 Corrosion (a) Chemical fundamentals; Formation by galvanic action process, microbiological contamination, mechanical stress.	1	1	1
(b) Types of corrosion and their identification; Causes of corrosion; Material types, and their susceptibility to corrosion.	2	3	2
6.5 Fasteners 6.5.1 Screw threads Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads.	2	2	2
6.5.2 Bolts, studs, and screws Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion, and removal; Self-tapping screws, dowels.	2	2	2
6.5.3 Locking devices Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick-release fasteners, keys, circlips, cotter pins	2	2	2
6.5.4 Aircraft rivets Types of solid and blind rivets: specifications and identification, heat treatment.	1	2	1
6.6 Pipes and unions (a) Identification and types of rigid and flexible pipes and their connectors used in aircraft;	2	2	2
(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	2	2	1
6.7 Springs Types of springs, materials, characteristics, and applications.	-	2	1
6.8 Bearings Purpose of bearings, loads, material, construction; Types of bearings and their application.	1	2	2

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6.9 Transmissions Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets.	1	2	2
6.10 Control cables Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.	1	2	1
6.11 Electrical cables and connectors Cable types, construction and characteristics; High-tension and coaxial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.	1	2	2

MODULE 7 — MAINTENANCE PRACTICES

MODULE 7 — MAINTENANCE PRACTICES	LEVEL		
	A1	B1	B2
	A2		
	A3		
	A4		
7.1 Safety precautions — aircraft and workshop Aspects of safe working practices including precautions to be taken when working with electricity, gases (especially oxygen), oils, and chemicals. Fuel tank safety and fuel tank entry procedures and precautions. Awareness and precautions regarding aircraft equipped with ballistic recovery systems. Also, instructions for the remedial action to be taken in the event of a fire or another accident with one or more of these hazards, including information on fire-extinguishing agents.	3	3	3
7.2 Workshop practices Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, workmanship standards; Calibration of tools and equipment, calibration standards.	3	3	3
7.3 Tools Common hand-tool types; Common power-tool types; Operation and use of precision-measuring tools; Lubrication equipment and methods; Operation, function, and use of electrical general test equipment.	3	3	3
7.4 Avionic General Test Equipment Operation, function and use of avionic general test equipment.	-	2	3
7.5 Engineering drawings, diagrams, and standards Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identification of title block information; Microfilm, microfiche, and computerised presentations; Specification of the Air Transport Association (ATA) of America and Specification S1000D ¹ ; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.	1	2	2
7.6 Fits and clearances Drill sizes for bolt holes, classes of fits; Common system for fits and clearances;	1	2	1

¹ S1000D Chapter Reference: in conformity with “S1000D Standard Numbering System (SNS)”

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Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings, and other parts.			
7.7 Electrical Wiring Interconnection System (EWIS) Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Coaxial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance; Wiring protection techniques: cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; High-Intensity Radiated Fields (HIRF) and protection principles; Soldering of electrical wires, EWIS installations, inspection, repair, maintenance, and cleanliness standards.	1	3	3
7.8 Riveting Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.	1	2	-
7.9 Pipes and hoses Bending and belling/flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.	1	2	-
7.10 Springs Inspection and testing of springs.	1	2	-
7.11 Bearings Testing, cleaning and inspection of bearings; Lubrication requirements for bearings; Defects in bearings and their causes.	1	2	-
7.12 Transmissions Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push–pull rod systems.	1	2	-
7.13 Control cables Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems.	1	2	-
7.14 Material handling			

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7.14.1 Sheet metal Marking out and calculation of bend allowance; Sheet metal working, including bending and forming; Inspection of sheet metal work.	-	2	-
7.14.2 Composite and non-metallic Bonding practices; Environmental conditions; Inspection methods.	-	2	-
7.14.3 Additive manufacturing Common additive manufacturing techniques and their influence on the mechanical properties of the finished part; Inspection of additive manufactured parts and common production failures.	1	1	1
7.15 Welding, Brazing, Soldering and Bonding (a) Soldering methods; inspection of soldered joints;	-	2	2
(b) Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	-	2	-
7.16 Aircraft weight and balance (a) Calculation of centre-of-gravity / balance limits: use of relevant documents.	-	2	2
(b) Preparation of aircraft for weighing; Aircraft weighing.	-	2	-
7.17 Aircraft handling and storage Aircraft taxiing/towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic, and pneumatic ground supplies; Effects of environmental conditions on aircraft handling and operation.	2	2	2
7.18 Disassembly, inspection, repair, and assembly techniques (a) Types of defects and visual inspection techniques; Corrosion removal, assessment and reprotection;	2	3	3
(b) General repair methods, structural repair manual; Ageing, fatigue, and corrosion control programmes;	-	2	-
(c) Non-destructive inspection techniques including penetrant, radiographic, eddy current, magnetic particle, ultrasonic and borescope inspections; including practical training in colour contrast penetrant inspection;	-	2	1
(d) Disassembly and reassembly techniques;	2	2	2

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(e) Troubleshooting techniques.	-	2	2
7.19 Abnormal events	2	2	2
(a) Inspections following lightning strikes and HIRF penetration;			
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	2	-
7.20 Maintenance procedures			
Maintenance planning;			
Modification procedures;			
Stores procedures;			
Certification/release procedures;	1	2	2
Interface with aircraft operation;			
Maintenance Inspection / Quality Control / Quality Assurance;			
Additional maintenance procedures;			
Control of life-limited components.			
7.21 Documentation and communication			
Documentation: elements and criteria for writing work reports, troubleshooting reports, and shift handover instructions.	1	2	2
Communication: clear, comprehensive, and concise.			
7.22 Armament Safety			
Safety principles and elements with armed aircraft, ammunitions;	2	2	2
Safety aspects of canopy, ejection seat and other pyrotechnic devices.			

MODULE 8 — BASIC AERODYNAMICS

MODULE 8 — BASIC AERODYNAMICS	LEVEL	
	A1	B1
	A2	B2
	A3	
	A4	
8.1 Physics of the atmosphere International Standard Atmosphere (ISA), and its application to aerodynamics.	1	2
8.2 Aerodynamics Airflow around a body; Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash-in and wash-out, fineness ratio, wing shape and aspect ratio; Thrust, weight, aerodynamic resultant; Generation of lift and drag angle of attack, lift coefficient, drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, and frost.	1	2
8.3 Theory of flight Relationship between lift, weight, thrust and drag; Glide ratio; Steady-state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope, and structural limitations; Lift augmentation.	1	2
8.4 High-speed airflow Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic heating, area rule; Factors that affect airflow in engine intakes of high-speed aircraft; Effects of sweepback on critical Mach number. Effects of external stores	1	2
8.5 Flight stability and dynamics Longitudinal, lateral, and directional stability (active and passive).	1	2

MODULE 9 — HUMAN FACTORS

MODULE 9 — HUMAN FACTORS	LEVEL
	ALL
9.1 General The need to take human factors into account when performing maintenance; Incidents attributable to human factors/human error; Murphy's law.	2
9.2 Human performance and limitations Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.	2
9.3 Social psychology Accountability and responsibility: individual and group; Motivation and demotivation; Peer pressure; Cultural issues; Teamwork; Management, supervision, and leadership; Military environment and other military factors	1
9.4 Factors that affect performance Fitness/health; Stress: domestic and work related; Time pressure and deadlines; Workload: overload, underload, and workload management; Sleep and fatigue, shift work; Alcohol, medication, drug abuse; Lack of manpower.	2
9.5 Physical environment Noise and fumes; Illumination; Climate and temperature; Motion and vibration; Military working environment; Situational awareness.	1
9.6 Tasks	

Physical work; Repetitive tasks, complacency; Visual inspection; Complex systems; Critical maintenance tasks and error-capturing methods; Technical documentation: access, use, and quality.	1
9.7 Communication Within and between teams; Work logging and recording; Shift handover; Keeping up to date, currency; Dissemination of information.	2
9.8 Human error Error models and theories; Types of error in maintenance tasks; Implications of errors (e.g. accidents); Organisational errors; Avoiding and managing errors.	2
9.9 Safety management Risk management; Occurrence reporting; Safety culture Just culture; Identifying, avoiding, and reporting hazards; Organisational human-factors programme: professionalism and integrity, error-provoking behaviour, reporting errors, disciplinary policy, error investigation, action to address problems, feedback, assertiveness; Dealing with emergencies.	2
9.10 The 'Dirty Dozen' and risk-mitigation The 'Dirty Dozen': the twelve most common human-factors errors in maintenance: Lack of communication, Lack of teamwork, Lack of assertiveness, Complacency, Fatigue, Stress, Lack of knowledge, Lack of resources, Lack of awareness, Distraction, Pressure, Norms,	2

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Risk-mitigation methods.	
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MODULE 10 — AVIATION LEGISLATION

MODULE 10 — AVIATION LEGISLATION	LEVEL	
	A1	B1
	A2	B2
	A3	
	A4	
10.1 Regulatory framework Military/State Organisation: Role of the National Military Airworthiness Authority; Introduction to the national military airworthiness regulations and the relationship between the Initial, Continued and Continuing Airworthiness The relationship between national military airworthiness regulations and their AMC & GM	1	1
10.2 Certifying staff — maintenance Deep understanding of EMAR 66 maintenance licences with the associated privileges and authorisations and how to exercise them properly.	2	2
10.3 Approved Maintenance Organisations General understanding of EMAR 145.	2	2
10.4 (Reserved)		
10.5 Air operations Operating Organisation's responsibilities, in particular regarding continuing airworthiness and maintenance; Aircraft Maintenance Programme; MEL/CDL or National equivalent; Documents to be carried on board; National Certificate of Registration; Weight & Balance report; National Noise Certificate if required. Aircraft placarding (markings).	1	1
10.6 Certification of products, parts and appliances General understanding of EMAR 21 and airworthiness codes/criteria; Documents; Military Type-Certificates; Military Restricted Type-Certificates; Military Supplemental Type-Certificates; Military Certificates Of Airworthiness; Military Restricted Certificates Of Airworthiness; Military Permit To Fly;	2	2
10.7 Continuing airworthiness		

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General understanding of EMAR 21 requirements related to continuing airworthiness; General understanding of EMAR M and EMAR CAMO; Aircraft Maintenance Programme.	2	2
10.8 Oversight principles in continuing airworthiness	1	1
10.9 (Reserved)		
10.10 Cybersecurity in aviation maintenance	1	1

MODULE 11 — AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 11 — AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL			
	A1	A2	B1.1	B1.2
11.1 Theory of flight (a) Aeroplane aerodynamics and flight controls Operation and effect of: — roll control: ailerons and spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; — yaw control, rudder limiters; — elevons, ruddervators; — high-lift devices, slots, slats, flaps, flaperons; — drag-inducing devices, spoilers, lift dumpers, speed brakes; — trim tabs, servo tabs, control surface bias.	1	1	2	2
(b) Aeroplane: other aerodynamic devices Operation and effect of: — balance and antibalance (leading) tabs; — spring tabs, mass balance, aerodynamic balance panels; — mass balance, aerodynamic balance panels; — effects of wing fences, saw tooth leading edges; — boundary layer control using vortex generators, stall wedges or leading-edge devices.	1	1	2	2
11.2 Airframe structures (System 51) (a) General concepts: — Zonal and station identification systems; — Electrical bonding; — Lightning strike protection provisions.	2	2	2	2
(b) Airworthiness requirements for structural strength: — Structural classification: primary, secondary, and tertiary; — Fail-safe, safe-life, damage-tolerance concepts; — Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; — Drains and ventilation provisions; — System installation provisions.	2	2	2	2
(c) Construction methods — Stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, skinning, anticorrosive protection, wing, empennage and engine attachments; — Structure assembly techniques: riveting, bolting, bonding; — Methods of surface protection, such as chromating, anodising, painting;	1	1	2	2

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— Surface cleaning; — Airframe symmetry: methods of alignment and symmetry checks.				
11.3 Airframe structures — Aeroplanes				
11.3.1 Fuselage, doors, windows (System 52/53/56)				
(a) Construction principles				
— Construction and pressurisation sealing;	1	1	2	2
— Wing, stabiliser, pylon, and undercarriage attachments;				
— Seat installation and cargo loading system;				
— Doors and emergency exits: construction, mechanisms, operation and safety devices;				
— Windows and windscreen construction and mechanisms.				
— Canopy construction and mechanism;				
(b) Airborne towing devices (glider, banner, target).	1	1	1	1
(c) Doors				
— Doors and emergency exits: safety devices;	1	1	2	2
— Cargo loading system.				
11.3.2 Wings (System 57)				
Construction;	1	1	2	2
Fuel storage;				
Landing gear, pylon, control surface and high lift/drag attachments.				
11.3.3 Stabilisers (System 55)				
Construction;	1	1	2	2
Control surface attachment.				
11.3.4 Flight control surfaces (System 55/57)				
Construction and attachments;	1	1	2	2
Balancing — mass and aerodynamics.				
11.3.5 Nacelles/Pylons (System 54)				
Nacelles/Pylons:				
— Construction,	1	1	2	2
— Firewalls,				
— Engine mounts.				
11.4 Air conditioning and cabin pressurisation (System 21)				
(a) Pressurisation				
Pressurisation systems;	1	1	3	3
Cabin pressure controllers, control, and safety valves;				
Control and indication.				

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Canopy seal, anti-g system	1		2	
(b) Air supply Sources of air supply including engine bleed, APU and ground cart; Distribution systems.	1	-	3	-
(c) Air conditioning Air-conditioning systems; Air cycle and vapour cycle machines; Flow, temperature and humidity control system; Control and indication control valves.	1	-	3	-
(d) Safety and warning devices Protection and warning devices.	1	1	3	3
(e) Heating and ventilation systems.	-	1	-	3
11.5 Instruments / avionics systems 11.5.1 Instrument systems (System 31) Pitot-static: Airspeed indicators, Vertical speed indicators, Altimeters; Gyroscopic: Gyroscopic principles, Artificial horizons, Attitude directors, Direction indicators, Horizontal situation indicators (HSI), Slip indicators, Turn indicators, Turn coordinators; Compass systems: systems, direct reading, remote reading, Stall-warning systems and angle-of-attack indicating systems, Glass cockpit, Indications of other aircraft systems.	1	1	2	2
11.5.2 Avionics systems Fundamentals of system layouts and operation of: Autoflight (System 22); Communication systems (System 23): — Very High Frequency (VHF) communications, — High Frequency (HF) communications, — Satellite Communications (SATCOM), — Controller–pilot data link communications (CPDLC), — Audio systems, — Emergency Locator Transmitters (ELTs), — Cockpit Voice Recorder (CVR);	1	1	1	1

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Navigation systems (System 34): — Very high frequency omnidirectional range (VOR), — Automatic direction finder (ADF), — Instrument landing system (ILS), — Microwave landing system (MLS), — Flight director systems (FDSs), distance-measuring equipment (DME), — Area navigation (RNAV) systems, — Flight management systems (FMSs), — Satellite navigation systems, — Air traffic control transponder, secondary surveillance radar, — Traffic alert and collision avoidance system (TCAS), — Weather avoidance radar, — Radio altimeter, — Inertial navigation system (INS), — ARINC (Aeronautical Radio Incorporated) communication and reporting. Types and uses of avionics general test equipment.				
11.6 Electrical power (System 24) Installation and operation of batteries; — DC power generation; — AC power generation; — Emergency power generation; — Voltage regulation; — Power distribution; — Inverters, transformers, rectifiers; — Circuit protection; — External/ground power.	1	1	3	3
11.7 Equipment and furnishings (System 25) (a) Emergency equipment: Emergency equipment requirements.	2	2	2	2
(b) Cabin and cargo layout: — Seats, harnesses, and belts; — Cabin layout; — Equipment layout; — Cabin furnishing installation; — Galley installation; — Cargo handling and retention equipment; — Airstairs.	1	1	1	1

11.8 Fire protection (System 26) (a) Fire and smoke detection system, and fire-extinguishing systems: — Fire and smoke detection and warning systems; — Fire-extinguishing systems; — System tests. (b) Portable fire extinguisher.	1	1	1	1
	1	1	1	1
11.9 Flight controls (System 27) (a) Primary and secondary flight controls: — Primary controls: aileron, elevator, rudder, spoiler; — Trim control, trim tabs; — High-lift devices; — System operation: manual; — Gust locks and gust lock systems; — Artificial feel, yaw damper, Mach trim, rudder limiter; — Stall-warning systems. (b) Actuation and protection: — Active load control; — Lift dump, speed brakes; — Hydraulic, pneumatic systems; — Stall-protection systems. (c) System operation: Electrical systems, fly-by-wire systems. (d) Balancing and rigging.	1	1	3	2
	1	-	3	-
	1	-	3	-
	1	1	3	3
11.10 Fuel systems (System 28, System 47) (a) Systems: — System layout; — Fuel tanks; — Supply systems. (b) Fuel handling: — Cross-feed and transfer; — Refuelling and defueling. (c) Indication and warnings. (d) Special systems: — Dumping, venting, and draining; — Inert gas systems. — Air to Air Refueling (AAR) (e) Balancing: Longitudinal balance fuel systems including during AAR.	1	1	3	3
	1	1	3	3
	1	1	3	3
	1	-	3	-
	1	-	3	-

11.11 Hydraulic power (System 29) (a) System description: System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Filters; Power distribution. (b) System operation (1): Pressure generation: electric and mechanical; Pressure control; Indication and warning systems; Servicing. (c) System operation (2): Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.	1	1	3	3
	1	1	3	3
	1	-	3	-
11.12 Ice and rain protection (System 30) (a) Principles: Ice formation, classification, and detection. (b) De-icing: De-icing systems: electrical, hot-air, pneumatic, chemical; Probe and drain heating. (c) Anti-icing: Anti-icing systems: electrical, hot-air, chemical. (d) Wipers: Wiper systems. (e) Rain-repellent systems.	1	1	3	3
	1	1	3	3
	1	-	3	-
	1	1	3	3
	1	-	3	-
11.13 Landing gear (System 32) (a) Description: Construction, shock absorbing; Tyres. (b) Systems: Extension and retraction systems: normal and emergency; Indications and warnings; Wheels, brakes, antiskid, and autobraking; Steering. (c) Air-ground sensing. (d) Tail protection: Skids. (e) Drag-chute and Arresting hook/landing assistance equipment.	2	2	3	3
	2	2	3	3
	2	-	3	-
	2	2	3	3
	1	-	1	-

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11.14 Lights (System 33) External: navigation, anticollision, landing, taxiing, ice, formation; Internal: cabin, cockpit, cargo, Night Vision Devices' Lighting; Emergency.	2	2	3	3
11.15 Oxygen (System 35) System layout: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.	1	1	3	3
11.16 Pneumatic / vacuum (System 36) (a) Systems: System layout; Sources: engine / APU (Auxiliary Power Unit), compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interface with other systems. (b) Pumps: Pressure and vacuum pumps.	1	1	3	3
11.17 Water / waste (System 38) (a) Systems: Water system layout, supply, distribution, servicing and draining; Toilet system layout, flushing and servicing. (b) Corrosion: Corrosion aspects.	2	2	3	3
11.18 Onboard maintenance systems (System 45) Central maintenance computers; Data-loading system; Electronic library system; Printing systems; Structure monitoring (damage-tolerance monitoring).	1	-	2	-

11.19 Integrated modular avionics (IMA) (System 42) (a) Overall system description and theory: Core system; network components; Functions that may be typically integrated in the integrated modular avionics (IMA) modules are, among others: Bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring, etc. (b) Typical system layout.	1	-	2	-
11.20 Cabin systems (System 44) System architecture, operation, and control of systems for: — passenger in-flight entertainment; — communication within the aircraft (Cabin intercommunication data system (CIDS); — communication between the aircraft cabin and ground stations; — including voice, data, music, and video transmission. CIDS interface between cockpit/cabin crew and cabin systems. Data exchange between the different related line replaceable units (LRUs). Flight attendant panels (FAPs). Cabin network server (CNS) and interfaces with the following systems: — Data/radio communication; — Cabin core system (CCS); — In-flight entertainment system (IFES); — External communication system (ECS); — Cabin mass memory system (CMMS); — Cabin monitoring system (CMS); — Miscellaneous cabin systems (MCSs); and — Other systems. Cabin network server (CNS) hosting functions: — Access to predeparture/departure reports; — Email/intranet/internet access; passenger database; — In-flight entertainment system; — External communication system; — Cabin mass memory system; — Cabin monitoring system; — Miscellaneous cabin system.	1	-	2	-
11.21 Information systems (System 46) System architecture, operation, and control of: — Storage and electronic library; — Updating;	1	-	2	-

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— Retrieving of digital information; — Air traffic and information management systems (ATIMS) and network server systems; — Aircraft general information system; — Flight deck information system; — Maintenance information system; — Passenger cabin information system; — Miscellaneous information systems; — Other linked systems.				
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MODULE 12 — HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 12 — HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
12.1 Theory of flight — rotary wing aerodynamics Terminology; Effects of gyroscopic precession; Torque reaction and directional control; Dissymmetry of lift, blade tip stall; Translating tendency and its correction; Coriolis effect and compensation; Vortex ring state, power setting, overpitching; Auto-rotation; Ground effect.	1	2
12.2 Flight control systems (System 67) Cyclic control; Collective control; Swashplate; Yaw control: antitorque control, tail rotor, bleed air; Main-rotor head: design and operation features; Blade dampers: function and construction; Rotor blades: main- and tail-rotor blade construction and attachment; Trim control, fixed and adjustable stabilisers; System operation: manual, hydraulic, electrical, fly-by-wire; Artificial feel; Balancing and rigging.	2	3
12.3 Blade tracking and vibration analysis (System 18) Rotor alignment; Main-rotor and tail-rotor tracking; Static and dynamic balancing; Vibration types, and vibration reduction methods; Ground resonance.	1	3
12.4 Transmission Gear boxes, main and tail rotors; Clutches, free wheel units and rotor brake; Tail-rotor drive shafts, flexible couplings, bearings, vibration dampers and bearing hangers.	1	3

12.5 Airframe structures (System 51) (a) General concept Airworthiness requirements for structural strength; Structural classification: primary, secondary, tertiary; Fail-safe, safe-life, damage-tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provisions. (b) Construction methods for the principal elements Stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, skinning and anticorrosive protection; Pylon, stabiliser and undercarriage attachments; Seat installation; Doors: construction, mechanisms, operation, and safety devices; Windows and windscreen construction; Fuel storage; Firewalls; Engine mounts; Structure assembly techniques: riveting, bolting, bonding; Methods for surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods for alignment and symmetry checks.	2	2
	1	2
12.6 Air conditioning (System 21) 12.6.1 Air supply Sources of air supply, including engine bleed and ground cart.	1	2
12.6.2 Air conditioning Air-conditioning systems; Distribution systems; Flow and temperature control systems; Protection and warning devices.	1	3
12.7 Instruments / avionics systems 12.7.1 Instrument systems (System 31) Pitot-static: altimeter, airspeed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Vibration indicating systems / health and usage monitoring systems (HUMSs); Glass cockpit; Indications of other aircraft systems.	1	2

12.7.2 Avionics systems Fundamentals of system layouts and operation of: Autoflight (System 22); Communications (System 23): — Very high frequency (VHF) communications, — High-frequency (HF) communications, — Satellite communications (SATCOM), — Controller–pilot data link communications (CPDLC), — Audio systems, — Emergency locator transmitters (ELTs), — Cockpit voice recorder (CVR); Navigation systems (System 34): — Very high frequency omnidirectional range (VOR), — Automatic direction finding (ADF), — Instrument landing system (ILS), — Microwave landing system (MLS), — Flight director systems (FDSs), distance-measuring equipment (DME), — Area navigation (RNAV) systems, — Flight management systems (FMSs), — Satellite navigation systems, — Inertial navigation system (INS), — Air traffic control transponder, secondary surveillance radar, — Traffic alert and collision avoidance system (TCAS), — Weather avoidance radar, — Radio altimeter, — ARINC communication and reporting. Types and uses of general test equipment for avionics.	1	1
12.8 Electrical power (System 24) Installation and operation of batteries; DC power generation, AC power generation; Emergency power generation; Voltage regulation, circuit protection; Power distribution; Inverters, transformers, rectifiers; External/Ground power.	1	3
12.9 Equipment and furnishings (System 25) (a) Emergency equipment requirements; Seats, harnesses, and belts; Lifting systems. (b) Emergency flotation systems; Cabin layout, cargo retention;	2	2
	1	1

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Equipment layout; Cabin furnishing installation.		
12.10 Fire protection (System 26) (a) Fire and smoke detection and warning systems; Fire-extinguishing systems; System tests. (b) Portable fire extinguishers	1 1	3 1
12.11 Fuel systems (System 28) System layout; Fuel tanks; Supply systems; Dumping, venting, and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defueling including Air to Air Refueling (AAR). Longitudinal balance fuel systems including during AAR.	1	3
12.12 Hydraulic power (System 29) System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Filters; Pressure control; Power distribution; Indication and warning systems; Interface with other systems; Servicing.	1	3
12.13 Ice and rain protection (System 30) Ice formation, classification, and detection; Anti-icing and de-icing systems: electrical, hot-air, and chemical; Rain repellent and removal; Probe and drain heating; Wiper system.	1	3

12.14 Landing gear (System 32) (a) System description and operation: Construction, shock absorbing; Extension and retraction systems: normal and emergency; Wheels, tyres, brakes; Steering; Skids, floats. (b) Sensors: Indications and warning; Air–ground sensing.	2	3
	2	3
12.15 Lights (System 33) External: navigation, anticollision, landing, taxiing, ice, formation; Internal: cabin, cockpit, cargo; Night Vision Devices' Lighting; Emergency.	2	3
12.16 Pneumatic/Vacuum (System 36) System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	1	3
12.17 Integrated modular avionics (IMA) (System 42) (a) Overall system description and theory Functions that may be typically integrated in the integrated modular avionics (IMA) modules: Bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring, etc.; Core System; Network Components. (b) Typical system layouts.	1	2
	1	2
12.18 Onboard maintenance systems (System 45) Central maintenance computers; Data-loading system; Electronic library system.	1	2
12.19 Information systems (System 46) The units and components which furnish a means of storing, updating, and retrieving digital information traditionally provided on paper, microfilm or microfiche. They include	1	2

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units that are dedicated to the information storage and retrieval function, such as the electronic library mass storage and controller. They do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general-use display.

Typical examples include air traffic and information management systems and network server systems.

Aircraft general information system.

Flight deck information system.

Maintenance information system.

Miscellaneous information system.

MODULE 13 — AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 13 — AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL
	B2
13.1 Theory of flight (a) Aeroplane aerodynamics and flight controls Operation and effect of: — roll control: ailerons and spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; and — yaw control: rudder limiters; — control using elevons, ruddervators; — high-lift devices: slots, slats, flaps; — drag-inducing devices: spoilers, lift dumpers, speed brakes; — trim tabs, servo tabs, and control surface bias. (b) Rotary wing aerodynamics Terminology; Operation and effect of cyclic, collective, and antitorque controls.	1
	1
13.2 Structures — general concepts (a) General concepts; Zonal and station identification systems; Electrical bonding; Lightning strike protection provisions. (b) Fundamentals of structural systems.	2
	1
13.3 Autoflight (System 22) (a) Fundamentals of automatic flight control: — Working principles and current terminology; — Command signal processing; — Modes of operation: roll, pitch, and yaw channels; — Yaw dampers; — Stability augmentation system in helicopters; — Automatic trim control; — Autopilot navigation aids interface. (b) Autothrottle systems and automatic landing systems: — Principles and categories; — Modes of operation; — Approach; — Glideslope; — Land, go-around;	3
	3

— System monitors and failure conditions.	
13.4 Communication/navigation (System 23/34) (a) Fundamentals of communication and navigation systems: — Radio wave propagation, antennas, transmission lines, communication, receiver, and transmitter; Working principles of the following systems: — Very high frequency (VHF) communications; — High-frequency (HF) communications; — Satellite communications (SATCOM); — Controller–pilot data link communications (CPDLC); — Audio systems; — Emergency locator transmitters (ELTs); — Cockpit voice recorder (CVR); — Very high frequency omnidirectional range (VOR); — Automatic direction finding (ADF); — Instrument landing system (ILS); — Microwave Landing System (MLS); — Flight director systems (FDSs), distancemeasuring equipment (DME); — Area navigation (RNAV) systems; — Flight management systems (FMSs); — Global navigation satellite systems (GNSSs), Global Positioning System (GPS), ground-based augmentation system (GBAS), satellite-based augmentation system (SBAS) such as the European geostationary navigation overlay service (EGNOS) and the wide area augmentation system (WAAS); — Data link and two-way data link; — Tactical Air Navigation System (TACAN); Very Low Frequency and hyperbolic navigation (VLF/OMEGA). (b) Fundamentals of aircraft surveillance systems: — Air traffic control transponder, secondary surveillance radar; — Traffic alert and collision avoidance system (TCAS); — Weather avoidance radar; — Radio altimeter; — Automatic dependent surveillance — broadcast (ADS-B) and its other associated services such as FIS-B, TIS-B and multilink; — Inertial navigation system (INS); — ARINC (Aeronautical Radio Incorporated) communication and reporting.	3
13.5 Electrical power (System 24) — Installation and operation of batteries; — DC power generation; — AC power generation; — Emergency power generation; — Voltage regulation;	3

— Power distribution; — Inverters, transformers, rectifiers; — Circuit protection; — External/ground power.	
13.6 Equipment and furnishings (System 25) Electronic emergency equipment requirements.	3
13.7 Flight controls (a) Primary and secondary flight controls (System 27): — Primary controls: aileron, elevator, rudder, spoiler; — Trim control: trim tabs; — High-lift devices; — System operation: manual; — Gust locks and gust lock systems; — Artificial feel, yaw damper, Mach trim, rudder limiter; — Stall-warning systems. (b) Actuation and protection: — Active load control; — Lift dump, speed brakes; — Hydraulic, pneumatic systems; — Stall-protection systems. (c) System operation: — System operation: electrical, fly-by-wire. (d) Rotorcraft flight controls (System 67): Rotorcraft controls: cyclic control, collective control, swashplate, yaw control.	2
	2
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	2
13.8 Instruments (System 31) Classification; — Atmosphere; — Terminology; — Pressure-measuring devices and systems; — Pitot-static systems; — Altimeters; — Vertical speed indicators; — Airspeed indicators; — Machmeters; — Altitude-reporting/-alerting systems; — Air-data computers; — Instrument pneumatic systems; — Direct-reading pressure and temperature gauges; — Temperature-indicating systems; — Gyroscopic principles; — Artificial horizons;	3

— Slip indicators; — Directional gyros; — Ground proximity warning systems (GPWSs); — Compass systems; — Flight data recording systems (FDRSs); — Electronic flight instrument systems (EFISs) — typical system arrangements and cockpit layout; — Instrument warning systems, including master warning systems and centralised warning panels; — Stall-warning systems and angle-of-attack indicating systems; — Vibration measurement and indication; — Glass cockpit; — Types and uses of general test equipment for avionics.	
13.9 Lights (System 33) External: navigation, anticollision, landing, taxiing, ice, formation; Internal: cabin, cockpit, cargo, Night Vision Devices' Lighting; Emergency.	3
13.10 Onboard maintenance systems (System 45) Central maintenance computers; Data-loading system; Electronic library system; Printing system; Structure monitoring system (damage-tolerance monitoring).	3
13.11 Air conditioning and cabin pressurisation (System 21) (a) Pressurisation: — Pressurisation systems; — Cabin pressure controllers, control and safety valves; — Control and indication. — Canopy seal and anti-g system; (b) Air supply: Sources of air supply including engine bleed, APU and ground cart; Distribution systems. (c) Air conditioning. (d) Safety and warning devices.	3
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13.12 Fire protection (System 26) (a) Fire and smoke detection system and fireextinguishing systems; — Fire and smoke detection and warning systems; — Fire-extinguishing systems; — System tests.	3

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(b) Portable fire extinguisher.	1
13.13 Fuel systems (System 28, System 47)	
(a) System layout: System layout; Fuel tanks; Supply systems.	1
(b) Fuel handling; Cross-feed and transfer; Refuelling and defueling, including Air to Air Refueling (AAR) .	2
(c) Indications and warnings.	3
(d) Special systems: Dumping, venting and draining; Inert gas systems. Air to Air Refueling	2
(e) Balancing: Longitudinal balance fuel systems including during AAR.	3
13.14 Hydraulic power (System 29)	
(a) System layout: System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Filters; Power distribution.	1
(b) System operation (1): Pressure generation: electric and mechanical; Pressure control; Indication and warning systems; Servicing.	3
(c) System operation (2): Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.	3
13.15 Ice and rain protection (System 30)	
(a) Principles: Ice formation, classification, and detection.	2
(b) De-icing: De-icing systems: electrical, hot-air, pneumatic, and chemical; Probe and drain heating.	3
(c) Anti-icing: Anti-icing systems: electrical, hot-air, and chemical.	2

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(d) Wiper systems.	1
(e) Rain repellent.	1
13.16 Landing gear (System 32)	
(a) Description: Construction, shock absorbing; Tyres.	1
(b) Systems: Extension and retraction systems: normal and emergency; Indications and warnings; Wheels, brakes, antiskid, and autobraking; Steering.	3
(c) Air-ground sensing	3
13.17 Oxygen (System 35)	
System layout: cockpit, cabin; Sources, storage, charging, and distribution; Supply regulation; Indications and warnings.	3
13.18 Pneumatic/vacuum (System 36)	
— System layout; Sources: engine/APU, compressors, reservoirs, ground supply; — Pressure control; — Distribution; — Indications and warnings; — Interfaces with other systems.	2
13.19 Water/waste (System 38)	
— Water system layout, supply, distribution, servicing, and draining; — Toilet system layout, flushing and servicing.	2

13.20 Integrated modular avionics (IMA) (System 42) (a) Overall system description and theory: Core system; Network components. Note: Functions that may be typically integrated into the integrated modular avionics (IMA) modules are, among others: — Bleed management; — Air pressure control; — Air ventilation and control; — Avionics and cockpit ventilation control, temperature control; — Air traffic communication; — Avionics communication router; — Electrical load management; — Circuit breaker monitoring; — Electrical system built-in test equipment (BITE); — Fuel management; — Braking control; — Steering control; — Landing gear extension and retraction; — Tyre pressure indication; — Oleo pressure indication; — Brake temperature monitoring. (b) Typical system layouts.	3 3
13.21 Cabin systems (System 44) System architecture, operation and control of systems for: — passenger in-flight entertainment; — communication within the aircraft (cabin intercommunication data system (CIDS); — communication between the aircraft cabin and ground stations, including voice, data, music and video transmission. CIDS interface between cockpit/cabin crew and cabin systems; Data exchange between the different related line replaceable units (LRUs); Flight attendant panels (FAPs). CNS server and interfaces with the following systems: — Data/radio communication system; — Cabin core system (CCS); — In-flight entertainment system (IFES); — External communication system (ECS); — Cabin mass memory system (CMMS); — Cabin monitoring system (CMS); — Miscellaneous cabin systems (MCSs). The CNS may host functions such as: — access to predeparture/departure reports; — email/intranet/internet access; — passenger database.	3

13.22 Information systems (System 46)

The units and components which furnish a means of storing, updating, and retrieving digital information traditionally provided on paper, microfilm or microfiche. They include units that are dedicated to the information storage and retrieval function, such as the electronic library mass storage and controller, but they do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general-use display.

Typical examples include:

- air traffic and information management systems and network server systems;
- aircraft general information system;
- flight deck information system;
- maintenance information system;
- passenger cabin information system;
- miscellaneous information systems;
- other linked systems.

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MODULE 14 — PROPULSION

MODULE 14 — PROPULSION	LEVEL
	B2
14.1 Engines (a) Constructional arrangement and operation of turbojet, turbofan, turboshaft, and turboprop engines. (b) Constructional arrangement and operation of auxiliary power units (APUs). (c) Constructional arrangement and operation of piston engines. (d) Constructional arrangement and operation of electric and hybrid engines, their electric energy storage and control systems. (e) Electronic engine control and fuel-metering systems (full authority digital engine control (FADEC)).	1 1 1 - 2
14.2 Electric/electronic engine indication systems — Exhaust gas temperature / interstage turbine temperature systems; — Cylinder head temperature, engine coolant temperature, engine speed; — Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; — Vibration measurement systems; — Oil pressure and temperature; — Fuel pressure, temperature, and flow; — Manifold pressure; — Engine torque.	2
14.3 Propeller systems — Propeller speed indication; — Speed control and pitch change methods — electrical/electronic; — Synchronising and synchrophasing equipment; — Electrical anti-icing/de-icing equipment.	2
14.4 Starting and ignition systems — Operation of engine start systems and components; — Ignition systems and components; — Maintenance safety requirements.	2

MODULE 15 — GAS-TURBINE ENGINE

MODULE 15 — GAS-TURBINE ENGINE	LEVEL	
	A1 A3	B1.1 B1.3
15.1 Fundamentals — Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; — The relationship between force, work, power, energy, velocity, and acceleration; — Constructional arrangement and operation of turbojet, turbofan, turboshaft, turboprop, and geared turbofan engines.	1	2
15.2 Engine performance — Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption; — Engine efficiencies; — By-pass ratio and engine pressure ratio; — Pressure, temperature, and velocity of the gas flow; — Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.	-	2
15.3 Inlet — Compressor inlet ducts; — Effects of various inlet configurations; — Ice protection.	2	2
15.4 Compressors — Axial and centrifugal types; — Constructional features, operating principles, and applications; — Fan balancing; — Operation: - o Causes and effects of compressor stall and surge; - o Methods of air-flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; - o Compressor ratio.	1	2
15.5 Combustion section Constructional features and principles of operation.	1	2
15.6 Turbine section — Operation and characteristics of different turbine blade types; — Blade-to-disk attachment; — Nozzle guide vanes; — Causes and effects of turbine blade stress and creep.	2	2
15.7 Exhaust		

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— Constructional features and principles of operation; — Convergent, divergent, and variable area nozzles; — Engine noise reduction; — Thrust reversers;	1	2
15.8 Bearings and seals Constructional features and principles of operation.	-	2
15.9 Lubricants and fuels — Properties and specifications of standard, alternate, and drop-in fuel; — Properties and specifications of lubricants; — Fuel additives; — Safety precautions.	1	2
15.10 Lubrication systems System operation/layout and components.	1	2
15.11 Fuel systems — Operation of engine control and fuel-metering systems, including electronic engine control (full authority digital engine control (FADEC)) and electronic power augmentation; — System layout and components.	1	2
15.12 Air systems Operation of engine air distribution and anti-icing control systems, including internal cooling and sealing, and external air services.	1	2
15.13 Starting and ignition systems — Operation of engine start systems and components; — Ignition systems and components; — Maintenance safety requirements.	1	2
15.14 Engine indication systems — Exhaust gas temperature / interstage turbine temperature; — Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; — Oil pressure and temperature; — Fuel pressure and flow; — Engine speed; — Vibration measurement and indication; — Torque; — Power.	1	2
15.15 Alternate turbine constructions — Geared turbofan (GTF); — Variable fan blades; — Open rotor/propfan; — Hybrid turbine-electric concepts and electric power augmentation;	-	1

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— Future trends and developments.		
15.16 Turboprop engines — Gas-coupled/free-turbine and gear-coupled turbines; — Reduction gears; — Integrated engine and propeller controls; — Overspeed safety devices.	1	2
15.17 Turboshaft engines Arrangements, drive systems, reduction gearing, couplings, control systems.	1	2
15.18 Auxiliary power units (APUs) Purpose, operation, protective systems.	1	2
15.19 Powerplant installation Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	1	2
15.20 Fire protection systems Operation of fire-detection and fire-extinguishing systems.	1	2
15.21 Engine monitoring and ground operation — Procedures for starting and ground run-up; — Interpretation of engine power output and parameters; — Trend (including oil analysis, vibration and borescope) monitoring; — Inspection of engine and components to criteria, tolerances and data specified by the engine manufacturer; — Compressor washing/cleaning; — Foreign object damage (FOD).	1	3
15.22 Engine storage and preservation Preservation and depreservation for the engine and its accessories/systems.	-	2
15.23 Power Augmentation Systems Operation and applications; Water injection, water methanol; Afterburner systems.	1	1

MODULE 16 — PISTON ENGINE

MODULE 16 — PISTON ENGINE	LEVEL	
	A2 A4	B1.2 B1.4
16.1 Fundamentals — Mechanical, thermal, and volumetric efficiencies; — Operating principles: 2-stroke, 4-stroke, Otto, diesel, and rotary (Wankel); — Piston displacement and compression ratio; — Engine configuration and firing order.	1	2
16.2 Engine performance — Power calculation and measurement; — Factors that affect engine power; — Mixtures/leaning, pre-ignition.	1	2
16.3 Engine construction — Crank case, crank shaft, cam shafts, sumps; — Accessory gearbox; — Cylinder and piston assemblies; — Connecting rods, inlet and exhaust manifolds; — Valve mechanisms; — Propeller reduction gearboxes.	1	2
16.4 Engine fuel systems 16.4.1 Carburettors — Types, construction, and principles of operation; — Icing and heating.	1	2
16.4.2 Fuel injection systems Types, construction, and principles of operation.	1	2
16.4.3 Electronic engine control — Operation of engine control and fuel-metering systems including electronic engine control (Full Authority Digital Engine Control (FADEC)); — System layout and components.	1	2
16.5 Starting and ignition systems — Starting systems, preheat systems; — Magneto types, construction, and principles of operation; — Ignition harnesses, spark plugs; — Low- and high-tension systems.	1	2
16.6 Induction, exhaust and cooling systems		

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— Construction and operation of induction systems, including alternate air systems; — Exhaust systems, engine cooling systems — air and liquid.	1	2
16.7 Supercharging/Turbocharging — Principles and purpose of supercharging and its effects on engine parameters; — Construction and operation of supercharging/turbocharging systems; — System terminology; — Control systems; — System protection.	1	2
16.8 Lubricants and fuels — Properties and specifications of standard, alternate, and drop-in fuel; — Properties and specifications of lubricants; — Fuel additives; — Safety precautions.	1	2
16.9 Lubrication systems System operation/layout and components.	1	2
16.10 Engine indication systems — Engine speed; — Cylinder head temperature; — Coolant temperature; — Oil pressure and temperature; — Exhaust gas temperature; — Fuel pressure and flow; — Manifold pressure.	1	2
16.11 Powerplant installation Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	1	2
16.12 Engine monitoring and ground operation — Procedures for starting and ground run-up; — Interpretation of engine power output and parameters; — Inspection of engine and components: criteria, tolerances, and data specified by the engine manufacturer.	1	3
16.13 Engine storage and preservation Preservation and depreservation for the engine and its accessories/systems.	-	2
16.14 Alternate piston-engine constructions Hybrid piston–electric concepts and electric power augmentation.	-	-

MODULE 17 — PROPELLER

MODULE 17 — PROPELLER	LEVEL	
	A1 A2	B1.1 B1.2
17.1 Fundamentals — Blade element theory; — High/low blade angle, reverse angle, angle of attack, rotational speed; — Propeller slip; — Aerodynamic, centrifugal, and thrust forces; — Torque; — Relative airflow on blade angle of attack; — Vibration and resonance	1	2
17.2 Propeller construction — Construction methods and materials used in wooden, composite and metal propellers; — Blade station, blade face, blade shank, blade back / thrust face and hub assembly; — Fixed pitch, controllable pitch, constant speed propeller; — Propeller/spinner installation.	1	2
17.3 Propeller pitch control — Speed control and pitch change methods — mechanical and electrical/electronic; — Feathering and reverse pitch; — Overspeed protection.	1	2
17.4 Propeller synchronising Synchronising and synchrophasing equipment.	-	2
17.5 Propeller ice protection Fluid and electrical de-icing equipment.	1	2
17.6 Propeller maintenance — Static and dynamic balancing; — Blade tracking; — Assessment of blade damage, erosion, corrosion, impact damage, delamination; — Propeller treatment/repair schemes; — Propeller engine running.	1	3
17.7 Propeller storage and preservation Propeller preservation and depreservation	1	2

MODULE 50 — PRINCIPLES OF ARMAMENT

MODULE 50 — PRINCIPLES OF ARMAMENT	LEVEL
	A B1 B2
50.1 Essential principles of Armament (a) Propellants and explosives; Pyrotechnics (including Flares); Stores loading / unloading (to include chaff and flares) including hang-up and misfire; Ammunitions transportation; Air-to-air missile; Air-to-ground missile; Air-to-sea missile; Aerial torpedo; Bombs (freefall and guided);	1
(b) Missile guidance methods: radar, infrared, electro-optical, passive anti-radiation; Missile warheads and detonation mechanisms; Guided weapon (missiles) aerodynamics and flight controls;	1
(c) Storage, de-stocking and ammunitions assembly; Documents for storage, release and transportation of explosive items and firearms and explosive regulations.	1

MODULE 51 — WEAPONS SYSTEMS

MODULE 51 — WEAPONS SYSTEMS	LEVEL		
	A	B1	B2
51.1 Weapons stores system (System 94) (a) Weapon and stores release, fire and jettison stores; Weapon suspension system; Interconnecting equipment to transport and release/fire weapons; Gunnery;	2	3	3
(b) Weapon control, designating and acquiring a target.	1	2	3

MODULE 52 — OPERATIONAL ATTACK SYSTEMS

MODULE 52 — OPERATIONAL ATTACK SYSTEMS	LEVEL		
	A	B1	B2
52.1 Attack System Management (System 39) Architecture, management; Attack system functions; General rules of man-machine communication; Digital Networks, hardware and software, other information networks, network for video signals, network for blanking signals, MIL-STD-1553B (STANAG 3838 and STANAG 3910), MIL-STD-1773; Stores management hardware and software; Attack system resources, contributing resources; Role during mission phases.	-	2	3
52.2 Operational attack functions (System 40) Air-to-air functions: fire control functions, bullet gun firing, short range, medium range or beyond visual range missiles firing, air-to-air management after weapons launch, management of onboard guidance; Air-to-surface functions, Air-to-sea functions; Information exchange and cooperation; Navigational functions, localisation, flight management, approach and landing management; Nap of the earth flight: terrain following and obstacle avoidance management; Self protection: defensive manoeuvres and tactics elaboration against threats; Identification: aerial and surface objects identification based on autonomous and external identification means.	-	2	3
52.3 Cross-technical attack functions (System 42) Tactical situation awareness; Aircraft Mission preparation and restitution, hardware and software; Cautions and warnings management; Mission system control and management; Trajectory management; Attack system compatibilities management, electromagnetic compatibility between all the transmitters and receivers.	-	2	3

MODULE 53 — SURVEILLANCE, IMAGE RECORDING, ELECTRONIC WARFARE, RADAR AND TELEMTRY

MODULE 53 — SURVEILLANCE, IMAGE RECORDING, ELECTRONIC WARFARE AND RADAR	LEVEL		
	A	B1	B2
53.1 Surveillance (System 93) Data processing; Data display; Recording; Identification; Infra-red and laser sensors; Surveillance radar; Magnetic sensors; Sonar sensors (active and passive).	1	2	3
53.2 Image recording (System 97) (a) Optical systems; (b) Specificities of aerial photography; Cameras.	1	2	2
	1	1	1
53.3 Electronic warfare (System 99) Active electromagnetic; Passive electromagnetic; ELINT; Infrared and Laser systems; Electromagnetic countermeasures.	-	2	3
53.4 Radar (System 92) Frequency generation Transmission Reception Processing Beam control Power supply and safety Conditioning Built-in tests	-	2	3
53.5 Telemetry (System 96-40) Subsystem used for telemetry, for applications other than missile, drone or decoy usage	-	2	3

MODULE 54 — CREW SAFETY

MODULE 54 — CREW SAFETY	LEVEL		
	A	B1	B2
54.1 Crew escape and safety (System 95) Ejection seats; Escape hatches/canopy, Miniature Detonating Cord (MDC); Global survival kits; Impact protection.	2	3	2

MODULE 55 — MILITARY COMMUNICATION SYSTEMS

MODULE 55 — MILITARY COMMUNICATION SYSTEMS	LEVEL		
	A	B1	B2
Tactical Data Links: Link 11, Link 16, Link 22; Tactical communications systems.	-	-	3

AMC1 Appendix I — Basic Knowledge Requirements Section 3

Basic training methods

Training methods are categorised as follows: 'instructor-centred training', 'student-centred training', and 'blended training'.

The actual training method and training tools should be adapted to suit the training subject and be chosen considering their intrinsic characteristics, such as but not limited to their efficiency and the pedagogical benefits of the training method/tool.

Basic training modules 7, 9, 11, 12, 13, 14, 15, 16 and 17 should not normally be taught solely through a student-centred method unless provisions are in place to verify the actual and progressive acquisition of knowledge, skills and attitude by the student.

AMC1 Appendix II — Basic examination standard

The tables below show the acceptable number of questions for the submodules. Justified deviations from these values are also acceptable, provided the sum of the questions complies with the total number of questions for a given module.

MODULE 1. MATHEMATICS

MODULE 1. MATHEMATICS	Number of questions	
	A	B1 B2
Total number for the module:	16	32
1.1 Arithmetic	6	6
1.2 Algebra	5	4
(a) Simple algebraic expressions		
(b) Equations	-	12
1.3 Geometry	-	3
(a) Simple geometrical constructions;		
(b) Graphical representation	5	4
(c) Trigonometry	-	3

MODULE 2. PHYSICS

MODULE 2. PHYSICS	Number of questions	
	A	B1 B2
Total number for the module:	32	52
2.1 Matter	4	5
2.2 Mechanics	6	7
2.2.1 Statics		
2.2.2 Kinetics	6	7
2.2.3 Dynamics	4	5

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(a) Mass, force and energy;		
(b) Momentum and conservation of momentum;	4	4
2.2.4 Fluid dynamics	2	2
(a) Gravity and density;		
(b) Viscosity; compressibility on fluids; static, dynamic, and total pressure.	2	3
2.3 Thermodynamics	2	2
(a) Temperature		
(b) Heat	2	8
2.4 Optics (Light)	-	5
2.5 Wave Motion and Sound	-	4

MODULE 3. ELECTRICAL FUNDAMENTALS

MODULE 3. ELECTRICAL FUNDAMENTALS	Number of questions	
	A	B1 B2
Total number for the module:	20	52
3.1 Electron Theory	2	2
3.2 Static Electricity and Conduction	3	3
3.3 Electrical Terminology	3	2
3.4 Generation of Electricity	3	2
3.5 Sources of DC Electricity	3	3
3.6 DC Circuits	1	2
3.7 Resistance/Resistor	-	3
(a) Resistance		
(b) Resistors	-	2
3.8 Power	-	3

3.9 Capacitance/Capacitor	-	4
3.10 Magnetism	-	3
(a) Theory of magnetism;		
(b) Magnetomotive force	-	1
3.11 Inductance/Inductor	-	4
3.12 DC Motor/Generator Theory	-	3
3.13 AC Theory	5	3
3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits	-	3
3.15 Transformers	-	3
3.16 Filters	-	1
3.17 AC Generators	-	3
3.18 AC Motors	-	2

MODULE 4. ELECTRONICS FUNDAMENTALS

MODULE 4. ELECTRONICS FUNDAMENTALS	Number of questions		
	A	B1	B2
Total number for the module:	-	20	40
4.1 Semiconductors			
4.1.1 Diodes	-	8	8
(a) Description and characteristics			
(b) Operation and function	-	-	7
4.1.2 Transistors	-	4	4
(a) Description and characteristics			
(b) Construction and operation	-	-	7
4.1.3 Integrated Circuits	-	3	2
(a) Basic description and operation			
(b) Description and operation	-	-	4

4.2 Printed Circuit Boards	-	2	3
4.3 Servomechanisms	-	3	2
(a) Principles			
(b) Construction, operation, and use.	-	-	3

MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS

MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS	Number of questions		
	A	B1	B2
Total number for the module:	20	40	72
5.1 Electronic Instrument Systems	4	4	4
5.2 Numbering Systems	-	3	5
5.3 Data Conversion	-	3	4
5.4 Data Buses	-	3	5
5.5 Logic Circuits	-	3	4
(a) Identification and applications			
(b) Interpretation of logic diagrams	-	-	4
5.6 Basic Computer Structure	6	4	2
(a) Computer terminology and technology			
(b) Computer operation	-	-	6
5.7 Microprocessors	-	-	4
5.8 Integrated Circuits	-	-	5
5.9 Multiplexing	-	-	4
5.10 Fibre Optics	-	3	3
5.11 Electronic Displays	2	2	4
5.12 Electrostatic Sensitive Devices	6	4	5
5.13 Software Management Control	-	3	3
5.14 Electromagnetic Environment	-	3	4

5.15 Typical Electronic/Digital Aircraft Systems

2

5

6

MODULE 6. MATERIALS AND HARDWARE

MODULE 6. MATERIALS AND HARDWARE	Number of questions		
	A	B1	B2
Total number for the module:	48	72	60
6.1 Aircraft Materials — Ferrous			
(a) Alloy steels used in aircraft	3	3	3
(b) Testing of ferrous materials	-	2	1
(c) Repair and inspection procedures	-	2	1
6.2 Aircraft Materials — Non-Ferrous			
(a) Characteristics	3	4	3
(b) Testing of non-ferrous material	-	3	2
(c) Repair and inspection procedures	-	2	1
6.3 Aircraft Materials — Composite and Non-Metallic			
6.3.1 Composite and non-metallic other than wood and fabric			
(a) Characteristics	2	4	3
(b) Detection of defects	2	4	-
(c) Repairs and inspection procedures	-	2	2
6.3.2 Wooden structures	-	-	-
6.3.3 Fabric covering	-	-	-
6.4 Corrosion			
(a) Chemical fundamentals;	3	3	3
(b) Types of corrosion	4	5	3
6.5 Fasteners			
6.5.1 Screw threads	4	4	3

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6.5.2 Bolts, studs and screws	6	6	5
6.5.3 Locking devices	2	2	2
6.5.4 Aircraft rivets	2	3	2
6.6 Pipes and Unions			
(a) Identification	1	1	1
(b) Standard unions	2	2	2
6.7 Springs	-	1	1
6.8 Bearings	2	4	3
6.9 Transmissions	3	4	4
6.10 Control Cables	4	5	4
6.11 Electrical Cables and Connectors	5	6	11

MODULE 7. MAINTENANCE PRACTICES

MODULE 7. MAINTENANCE PRACTICES	Number of questions		
	A	B1	B2
Total number for the module:	80	88	68
7.1 Safety Precautions-Aircraft and Workshop	4	4	4
7.2 Workshop Practices	4	4	4
7.3 Tools	6	6	6
7.4 Avionic General Test Equipment	-	1	2
7.5 Engineering Drawings, Diagrams and Standards	6	6	6
7.6 Fits and Clearances	5	5	5
7.7 Electrical Wiring Interconnection System (EWIS)	4	4	8
7.8 Riveting	4	3	-
7.9 Pipes and Hoses	4	3	-
7.10 Springs	1	1	-

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7.11 Bearings	4	3	-
7.12 Transmissions	3	3	-
7.13 Control Cables	4	3	-
7.14 Material handling			
7.14.1 Sheet Metal	-	2	-
7.14.2 Composite and non-metallic	-	2	-
7.14.3 Additive manufacturing	2	4	2
7.15 Welding, Brazing, Soldering and Bonding	-	2	2
(a) Soldering methods; inspection of soldered joints;			
(b) Welding and brazing methods;	-	1	-
7.16 Aircraft Weight and Balance	-	2	2
(a) Centre of Gravity calculation			
(b) Aircraft weighing;	-	1	-
7.17 Aircraft Handling and Storage	7	5	6
7.18 Disassembly, Inspection, Repair and Assembly Techniques	2	2	2
(a) Types of defects and visual inspection techniques;			
(b) General repair methods, Structural Repair Manual;	-	2	-
(c) Non-destructive inspection techniques	-	1	1
(d) Disassembly and re-assembly techniques;	2	1	1
(e) Troubleshooting techniques.	-	1	1
7.19 Abnormal Events	2	1	2
(a) Inspections following lightning strikes and HIRF penetration;			
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	1	-
7.20 Maintenance Procedures	6	6	6
7.21 Documentation & communication	4	4	4
7.22 Armament Safety	4	4	4

MODULE 8. BASIC AERODYNAMICS

MODULE 8. BASIC AERODYNAMICS	Number of questions
	ALL
Total number for the module:	24
8.1 Physics of the Atmosphere International Standard Atmosphere (ISA), application to aerodynamics.	2
8.2 Aerodynamics	9
8.3 Theory of Flight	7
8.4 High-speed airflow	4
8.5 Flight Stability and Dynamics	2

MODULE 9. HUMAN FACTORS

MODULE 9. HUMAN FACTORS	Number of questions
	ALL
Total number for the module:	28
9.1 General	3
9.2 Human Performance and Limitations	3
9.3 Social Psychology	2
9.4 Factors that affect Performance	3
9.5 Physical Environment	2
9.6 Tasks	2
9.7 Communication	3
9.8 Human Error	4
9.9 Safety management	2
9.10 The 'Dirty Dozen' and risk mitigation	4

MODULE 10. AVIATION LEGISLATION

MODULE 10. AVIATION LEGISLATION	Number of questions	
	A	B1 B2
Total number for the module:	32	36
10.1 Regulatory Framework	5	5
10.2 Certifying Staff — Maintenance	7	7
10.3 Approved Maintenance Organisations	6	6
10.4 (Reserved)	-	-
10.5 Air operations	4	4
10.6 Certification of Products, parts and appliances	1	4
10.7 Continuing airworthiness	6	7
10.8 Oversight principles in continuing airworthiness	2	2
10.9 (Reserved)	-	-
10.10 Cybersecurity in aviation maintenance	1	1

MODULE 11. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 11. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	Number of questions			
	A1	A2	B1.1	B1.2
Total number for the module:	108	72	140	100
11.1 Theory of Flight	2	2	2	2
(a) Aeroplane Aerodynamics and Flight Controls				
(b) Aeroplane, other aerodynamic devices.	2	2	2	2
11.2 Airframe Structures (System 51)	3	3	4	3
(a) General concepts				
(b) Airworthiness requirements for structural strength	3	3	3	3

(c) Construction methods	1	1	3	2
11.3 Airframe Structures — Aeroplanes				
11.3.1 Fuselage, doors, windows (System 52/53/56)				
(a) Construction principles	1	1	2	2
(b) Airborne towing devices	1	1	1	1
(c) Doors	1	1	1	1
11.3.2 Wings (System 57)	2	2	3	3
11.3.3 Stabilisers (System 55)	1	1	2	2
11.3.4 Flight Control Surfaces (System 55/57)	1	1	2	2
11.3.5 Nacelles/Pylons (System 54)	1	1	2	2
11.4 Air Conditioning and Cabin Pressurisation (System 21)				
(a) Pressurisation	2	2	3	1
Canopy seal, anti-g system;	1	-	1	-
(b) Air supply	3	-	3	-
(c) Air conditioning	2	-	2	-
(d) Safety and warning devices	2	1	2	2
(e) Heating and ventilation system	-	1	-	2
11.5 Instruments/Avionic Systems				
11.5.1 Instrument Systems (System 31)	2	2	4	4
11.5.2 Avionic Systems				
Fundamentals of system lay-outs and operation of:				
— Auto Flight (System 22),	3	2	5	4
— Communications (System 23),				
— Navigation Systems (System 34).				
11.6 Electrical Power (System 24)	4	3	5	5
11.7 Equipment and Furnishings (System 25)				

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(a) Emergency equipment	4	2	4	3
(b) Cabin and cargo lay-out	3	3	3	3
11.8 Fire Protection (System 26)				
(a) Fire and smoke detection system and fire extinguishing systems	3	2	4	3
(b) Portable fire extinguisher.	1	1	1	1
11.9 Flight Controls (System 27)				
(a) Primary and secondary flight controls	3	2	4	4
(b) Actuation and protection	3	-	3	-
(c) System operation	3	-	3	-
(d) Balancing and rigging	1	1	3	3
11.10 Fuel Systems (Systems 28, 47)				
(a) System lay-out	2	2	3	3
(b) Fuel handling	2	2	2	2
(c) Indication and warnings	1	1	2	2
(d) Special systems	1	-	1	-
(e) Balancing.	2	-	2	-
11.11 Hydraulic Power (System 29)				
(a) System description	1	1	3	3
(b) System operation (1)	1	1	3	2
(c) System operation (2)	2	-	2	-
11.12 Ice and Rain Protection (System 30)				
(a) Principles	1	1	2	2
(b) De-icing	1	1	2	2
(c) Anti-icing	1	-	2	-
(d) Wipers	1	1	2	2

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(e) Rain-repellent systems	2	-	2	-
11.13 Landing Gear (System 32)				
(a) Description	3	3	4	3
(b) System operation	3	3	4	2
(c) Air-ground sensing	1	-	1	-
(d) Tail protection	1	1	1	1
(e) Drag-chute and Arresting hook/landing assistance equipment.	1	-	1	-
11.14 Lights (System 33)	2	2	3	3
11.15 Oxygen (System 35)	3	3	4	4
11.16 Pneumatic/Vacuum (System 36)				
(a) Systems	3	3	3	3
(b) Pumps	3	3	3	3
11.17 Water/Waste (System 38)				
(a) Systems	2	2	2	2
(b) Corrosion	1	1	1	1
11.18 On Board Maintenance Systems (System 45)	3	-	3	-
11.19 Integrated Modular Avionics (System 42)				
(a) Overall system description and theory	1	-	1	-
(b) Typical system layouts	1	-	1	-
11.20 Cabin Systems (System 44)	1	-	1	-
11.21 Information Systems (System 46)	2	-	2	-

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	Number of questions	
	A3 A4	B1.3 B1.4
Total number for the module:	100	132
12.1 Theory of Flight — Rotary Wing Aerodynamics	6	9
12.2 Flight Control Systems (System 67)	9	9
12.3 Blade Tracking and Vibration Analysis (System 18)	6	9
12.4 Transmission	3	6
12.5 Airframe Structures (System 51)		
(a) General concept	5	6
(b) Construction methods of the principal elements	5	7
12.6 Air Conditioning (System 21)		
12.6.1 Air supply	1	2
12.6.2 Air conditioning	3	5
12.7 Instruments/Avionic Systems		
12.7.1 Instrument Systems (System 31)	5	9
12.7.2 Avionic Systems Fundamentals of system layouts and operation of: Auto Flight (System 22); Communications (SYSTEM 23); Navigation Systems (System 34).	5	7
12.8 Electrical Power (System 24)	8	10
12.9 Equipment and Furnishings (System 25)		
(a) Emergency equipment	2	3
(b) Emergency flotation systems;	3	3
12.10 Fire Protection (System 26)		

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(a) Fire and smoke detection systems and Fire extinguishing systems	3	4
(b) Portable fire extinguishers	1	1
12.11 Fuel Systems (System 28)	7	8
12.12 Hydraulic Power (System 29)	8	8
12.13 Ice and Rain Protection (System 30)	4	4
12.14 Landing Gear (System 32)		
(a) System description and operation	3	4
(b) Sensors	3	3
12.15 Lights (System 33)	3	4
12.16 Pneumatic/Vacuum (System 36)	1	4
12.17 Integrated Modular Avionics (System 42)		
(a) Overall system description and theory	1	1
(b) Typical system layouts	1	1
12.18 On Board Maintenance Systems (System 45)	2	3
12.19 Information Systems (System 46)	2	2

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	Number of questions
	B2
Total number for the module:	188
13.1 Theory of Flight	
(a) Aeroplane Aerodynamics and Flight Controls	3
(b) Rotary Wing Aerodynamics	1
13.2 Structures — General Concepts (System 51)	
(a) General concepts	4
(b) Fundamentals of structural systems	4

13.3 Autoflight (System 22)	
(a) Fundamentals of automatic flight control	16
(b) Autothrottle systems and automatic landing systems	8
13.4 Communication/Navigation (System 23/34)	
(a) Fundamentals of communication and navigation systems	24
(b) Fundamentals of aircraft surveillance systems	3
13.5 Electrical Power (System 24)	12
13.6 Equipment and Furnishings (System 25)	5
13.7 Flight Controls	
(a) Primary and secondary flight controls (System 27)	4
(b) Actuation and protection	4
(c) System operation	2
(d) Rotorcraft flight controls (System 67)	2
13.8 Instruments (System 31)	20
13.9 Lights (System 33)	7
13.10 On-Board Maintenance Systems (System 45)	5
13.11 Air Conditioning and Cabin Pressurisation (System 21)	
(a) Pressurisation	2
Canopy seal and anti-g system;	1
(b) Air supply	2
(c) Air Conditioning	2
(d) Safety and warning devices	2
13.12 Fire Protection (System 26)	
(a) Fire and smoke detection system and fire extinguishing systems	2
(b) Portable fire extinguisher.	1
13.13 Fuel Systems (Systems 28, 47)	
(a) System lay-out;	2

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(b) Fuel handling	2
(c) Indications and warnings	2
(d) Special systems	2
(e) Balancing	1
13.14 Hydraulic Power (System 29)	
(a) System lay-out	1
(b) System operation (1)	5
(c) System operation (2)	5
13.15 Ice and Rain Protection (System 30)	
(a) Principles	1
(b) De-icing	2
(c) Anti-icing	1
(d) Wiper systems	1
(e) Rain repellent	1
13.16 Landing Gear (System 32)	
(a) Description	1
(b) System	3
(c) Air-ground sensing	3
13.17 Oxygen (System 35)	2
13.18 Pneumatic/Vacuum (System 36)	6
13.19 Water/Waste (System 38)	2
13.20 Integrated Modular Avionics (System 42)	
(a) Overall system description and theory	2
(b) Typical system layouts	1
13.21 Cabin Systems (System 44)	3
13.22 Information Systems (System 46)	3

MODULE 14. PROPULSION

MODULE 14. PROPULSION	Number of questions
	B2
Total number for the module:	28
14.1 Engines	
(a) Turbine engines	3
(b) Auxiliary power units (APUs)	4
(c) Piston engines	2
(d) Electric and hybrid engines	-
(e) Engine control	3
14.2 Electric/electronic engine indication Systems	10
14.3 Propeller systems	2
14.4 Starting and Ignition Systems	4

MODULE 15. GAS TURBINE ENGINE

MODULE 15. GAS TURBINE ENGINE	Number of questions	
	A1	B1.1
	A3	B1.3
Total number for the module:	60	92
15.1 Fundamentals	4	4
15.2 Engine Performance	-	6
15.3 Inlet	3	4
15.4 Compressors	5	7
15.5 Combustion Section	3	3
15.6 Turbine Section	5	5
15.7 Exhaust	4	4
15.8 Bearings and Seals	-	3

15.9 Lubricants and Fuels	3	4
15.10 Lubrication Systems	3	4
15.11 Fuel Systems	4	5
15.12 Air Systems	3	3
15.13 Starting and Ignition Systems	3	4
15.14 Engine Indication Systems	5	7
15.15 Alternate turbine constructions	-	2
15.16 Turboprop Engines	3	5
15.17 Turboshaft Engines	2	3
15.18 Auxiliary Power Units (APUs)	2	3
15.19 Powerplant Installation	2	3
15.20 Fire Protection Systems	2	3
15.21 Engine Monitoring and Ground Operation	3	6
15.22 Engine Storage and Preservation	-	3
15.23 Power Augmentation Systems	1	1

MODULE 16. PISTON ENGINE

MODULE 16. PISTON ENGINE	Number of questions	
	A2 A4	B1.2 B1.4
Total number for the module:	52	76
16.1 Fundamentals	5	5
16.2 Engine Performance	3	5
16.3 Engine Construction	7	8
16.4 Engine Fuel Systems 16.4.1 Carburettors	3	4

16.4.2 Fuel injection systems	2	4
16.4.3 Electronic engine control	2	4
16.5 Starting and Ignition Systems	5	5
16.6 Induction, Exhaust and Cooling Systems	3	4
16.7 Supercharging/Turbocharging	4	6
16.8 Lubricants and Fuels	2	5
16.9 Lubrication Systems	3	4
16.10 Engine Indication Systems	6	7
16.11 Powerplant Installation	3	3
16.12 Engine Monitoring and Ground Operation	3	5
16.13 Engine Storage and Preservation	-	3
16.14 Alternative piston engine constructions	1	4

MODULE 17. PROPELLER

MODULE 17. PROPELLER	Number of questions	
	A1 A2	B1.1 B1.2
Total number for the module:	20	32
17.1 Fundamentals	5	8
17.2 Propeller Construction	4	5
17.3 Propeller Pitch Control	4	6
17.4 Propeller Synchronising	-	2
17.5 Propeller Ice Protection	2	3
17.6 Propeller Maintenance	3	6
17.7 Propeller Storage and Preservation	2	2

MODULES 50-55. MILITARY SPECIFIC SYSTEMS

For Military Specific Systems the distribution of the questions within modules 50-55 should be determined by the MTO in coordination with the NMAA.

AMC to Appendix III to EMAR 66 ‘Military aircraft type training and type evaluation standard - On-the-Job Training (OJT)’

Military 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.

AMC1 Appendix III Military Aircraft Type Training and Type evaluation standard - On-The-Job Training (OJT) Section 1

Military aircraft type training

1. Military aircraft type training may be sub-divided 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, 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 systems 22, 23, 24, 25, 27, 31, 33, 34, 42, 44, 45, 46, 73 and 77 or equivalent. Type training for military specific systems (and their interfaces with other aircraft systems) may be included in these sub-divisions as appropriate or carried out as a separate course.
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 or national equivalent;

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- 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 where applicable;
 - 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.
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, Maintenance Simulation Training Devices (MSTDs), and Maintenance Training Devices (MTDs).
7. The integration and usage of MSTDs and MTDs in maintenance type training (theoretical and/or practical) should consider the following:
- The use of actual aircraft components should be allowed for any MSTD or MTD, even if the components are in a non-airworthy condition.
 - The complexity and degree of simulation for an MSTD may vary and should support type training elements that address a component, a system or the entire aircraft. Based on its characteristics and capabilities, the MSTD may be:
 - a training device capable of providing, for the respective component or system, the representation of aircraft location, access and layout, and for servicing with an acceptable level of accuracy and limited simulation; or
 - a training device capable of providing, for the respective component or system, the representation of aircraft location, access and layout with sufficient accuracy and with interactive simulation for servicing, and the applicable maintenance data for operational (O) and functional (F) test elements including Built-In Test (BIT) initiation and monitoring from outside

- the cockpit; such representation should have the capability to accommodate some troubleshooting scenarios; or
- a training device capable of providing, for the respective component or system, the representation of onboard (flight deck/cockpit or cabin) indication and controls with an acceptable level of accuracy and limited interactive simulation; or
- a training device capable of providing, for the respective component or system, the representation of onboard (flight deck/cockpit or cabin) indication and controls with sufficient accuracy and with interactive simulation for servicing, and the applicable maintenance data for operational (O) and functional (F) test elements including BIT initiation and monitoring; such representation should have the capability to accommodate some troubleshooting scenarios; or
- any combination of the above.
- Flight Simulation Training Devices (FSTDs) may be used as MSTDs whenever their characteristics and capabilities are considered appropriate for, and supportive of, the delivery of the respective maintenance training element(s).
- An MTD is any training device other than an MSTD used for maintenance training and/or examination and/or assessment.

AMC to Paragraphs 1(b), 3.2 and 4.2 of Appendix III to EMAR 66 “Military aircraft type training and type evaluation standard - On-the-Job Training (OJT)”

Practical Element of the Military 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 EMAR 66.
3. The duration of the practical training should ensure that the content of training required by paragraph 3.2 of Appendix III to EMAR-66 is completed.

Nevertheless, 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 agreed by the NMAA.
4. The organisation providing the practical element of the Type Training should provide trainees 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 EMAR 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 EMAR 66.

6. The practical element (for powerplant and avionic systems) of the Type Rating Training may be subcontracted by the approved EMAR 147 organisation under its quality system according to the provisions of EMAR 147.A.145(d)3 and the corresponding Guidance Material.
7. The practical element of the Type Training can be performed concurrently with the OJT element if both are performed on the same military aircraft type and in a real maintenance environment.

AMC to Paragraph 1(c) of Appendix III to EMAR 66 “Military aircraft type training and type evaluation standard - On-the-Job Training (OJT)”

Differences Training

Approved difference training is not required for different models within the same aircraft type rating (as specified by the NMAA) for the purpose of Type Rating endorsement on the MAML.

However, this does not necessarily mean that no training is required before a certifying staff authorisation can be issued by the MO (refer to AMC 66.A.20(b)(3)).

GM1 Appendix III Military Aircraft Type Training and type evaluation standard — On-the-Job Training (OJT) Section 1(c)

Differences Training

If the holder of a B1 and B2 licence, without any type rating, successfully completes a combined type training course (B1 + B2) followed by an OJT tailored only to B1 tasks, they can obtain only the type rating endorsement that is applicable to the B1 subcategory.

Within the next 3 years from the completion of the combined training course, endorsement of the aircraft type for the B2 category is possible after carrying out an OJT programme limited to the tasks relevant to the B2 category only.

When instead, the aircraft type endorsement would be requested after more than 3 years, the applicant would be required to also pass a differences type training course (from B1 to B2) plus the OJT programme limited to the tasks relevant to the B2 category only. All common theoretical and practical elements, and OJT tasks, already demonstrated as B1, shall be considered fulfilled.

AMC1 Appendix III Military Aircraft Type Training and type evaluation standard — On-the-Job Training (OJT) Section 3

Aircraft Type Training Standard

Training methods are categorised as ‘instructor-centred’, ‘student-centred’ and ‘blended training’.

The actual training method and the training tools should be adapted to suit the training subject and be chosen considering their intrinsic characteristics, such as but not limited to their efficiency and the pedagogical benefits of the method/tool.

A complex or critical subject should not normally be taught solely through a student-centred method unless provisions are in place to verify the actual and progressive acquisition of knowledge of the student.

Complex and critical areas should be identified by the Training Needs Analysis (TNA). The complexity and criticality of the areas could differ on a case-by-case basis (that is, areas proven to be critical by organisations' 'in-service events', occurrence reporting, human factors, safety, etc.), but should in any case cover the Maintenance Areas with Special Emphasis (MASE) identified by the type-certificate holder (TCH) in its operational suitability data (OSD).

AMC1 Appendix III Military Aircraft Type Training and type evaluation – On-the-Job Training (OJT) Section 3.1(d)

Training Needs Analysis (TNA) for the theoretical element of the Military Aircraft Type Training

1. NOT APPLICABLE.
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.
3. The content and the duration deriving from this TNA may be supported by an analysis from the (Military) Type Certificate holder.
4. NOT APPLICABLE.
5. When developing the TNA the following should be considered:
 - a) 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 in order to meet the learning objectives.
 - b) As a minimum, the Training Need Analysis (TNA) should take into account all the applicable elements contained in paragraph 3.1 of EMAR-66 Appendix III and associated AMCs.
 - c) 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 EMAR-66 Appendix III.
 - d) For each chapter described in the theoretical element table contained in paragraph 3.1 of EMAR 66 Appendix III, the corresponding training time should be recorded.
 - e) Typical documents to be used in order 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 or national equivalent.
 - f) 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;
 - In-service experience;
 - Novel or unusual design features (not covered by EMAR 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
 - Systems 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 EMAR 66);
- Organise the training into modules in a logical sequence (adequate combination of chapters as defined in Appendix III of EMAR 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:
 - (a) Complexity of the system (e.g. the need of further break down into subsystems, etc.);
 - (b) Design specifics which may require more detailed presentation or may contribute to maintenance errors;

- (c) Normal and emergency functioning;
 - (d) Troubleshooting;
 - (e) Interpretation of indications and malfunctions;
 - (f) Use of maintenance publications;
 - (g) Identification of special tools and equipment required for servicing and maintaining the aircraft;
 - (h) Maintenance Practices;
 - (i) Routine inspections, functional or operational tests, rigging/adjustment, etc.
- Describe the following:
 - The instructional methods and training tools and their blended application in order to ensure the effectiveness of the training;
 - The maintenance training documentation/material to be delivered to the student;
 - Facilitated discussions, questioning session, additional practice-oriented training, etc;
 - The homework, if developed,
 - 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 subjects which may be delivered through interactive simulation training devices and/or covered by self-paced elements. The 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. The NMAA 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 same time.
- j) The minimum participation time in order 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, unless the NMAA approves otherwise. 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 operational feedback, maintenance occurrences, Airworthiness Directives or national equivalent, 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.

AMC1 Appendix III Aircraft type training and type evaluation standard — on-the-job training (OJT) Section 4.1

Type training examination and assessment standard

4.1 Theoretical element examination standard

Examinations may be computer or paper-based, or a combination of both. Refer to EMAR 147.A.135.

AMC to Section 5 of Appendix III to EMAR 66 “Military aircraft type training and type evaluation standard - On-the-Job Training (OJT)”

Type Examination Standard

NOT APPLICABLE.

AMC1 Appendix III Military Aircraft Type Training and type evaluation standard - On-the-Job Training (OJT) Section 6

On-the-Job Training (OJT)

General

‘Maintenance organisations appropriately approved according to EMAR 145 for the maintenance of that aircraft type’ means EMAR 145 approved Maintenance Organisations (MOs) that hold an ‘A’ rating for such aircraft.

The OJT may be split in several parts and carried out at different approved MOs, also combining line and base facilities from the same or different organisations. The organisation at which the final assessment is carried out, should control and coordinate the OJT activities and have the responsibility for the entire OJT programme.

The procedures for the OJT should be included in the Exposition Manual of the approved MO.

‘Skills and responsibilities of a typical certifying staff’ include but are not limited to:

- understanding the importance of professional integrity, behaviour and having an appropriate attitude towards safety;
- understanding the conditions for ensuring the continuing airworthiness of aircraft and components;
- the ability to identify and rectify existing and potential unsafe conditions;
- the ability to prioritise tasks, coordinate with a team, and report discrepancies;
- the ability to determine the required qualifications for the performance of maintenance tasks;
- the ability to confirm the proper accomplishment of maintenance tasks;
- the ability to compile and control completed work cards;

- knowledge of safety risks linked to a particular working environment;
- understanding of human performance and limitations;
- understanding of the approved MO's (where the OJT is performed) privileges and limitations;
- understanding of the approved MO's personnel authorisations and limitations;
- being familiar with the approved MO's documents/forms (work packages, work orders, work cards, etc.);
- being familiar with approved MO's release-to-service procedures: use of the aircraft technical logbook (ATLB), deferral of items and dispatch under MEL/CDL;
- access, use and control of the required tools and equipment;
- access, use and control of the required ICAs (AMM, TSM, SRM, etc.).

OJT content and OJT logbook

If the aircraft manufacturer has defined the OJT tasks during the type certification of a particular aircraft type (e.g. the operational suitability data (OSD) has been approved for a particular aircraft type), those tasks should be selected. In particular, the analysis performed for the Maintenance Areas of Specific Emphasis (MASE), helps the organisation identify the more appropriate tasks.

Where no such data exists, the task list in Appendix II to the AMC to Annex III (EMAR 66) serves as the basis to develop an OJT programme including the applicable tasks for a particular aircraft type, based typically on the AMM. The tasks may be selected from the table in Appendix II in order to cover a broader representative sample of both simple and complex tasks on the particular aircraft type in order to reach a balanced distribution of the tasks between line and base maintenance. The tasks should be selected among those that are applicable to the aircraft type and the licence (sub)category applied for; for example, the selection could exclude location tasks (LOC) and tasks that can be considered under the category A licence privileges (seat covers, boilers, wheels, etc.).

A minimum number of tasks, as described in point 2 'List of tasks for OJT' of Appendix II, of each of the following categories should be performed: INS/inspections, FOT/functional or operational, SGH/servicing, R/I removal and installation, MEL, and T/S troubleshooting. The licensing authority may accept that a limited number of tasks is not performed as long as the relevant cross section of the tasks as regards quality, quantity and complexity is still assured.

A task may be performed on the analogous system installed on a different aircraft type when the systems are similar in terms of design architecture, technology, and functionality. This can be the case, for example, for tasks performed on engines or landing gear of aircraft of the same manufacturer.

Such task should be clearly identified and recorded.

Certain maintenance tasks could be performed on non-airworthy aircraft that still maintain functionality of systems to the extent that the maintenance tasks can be completely performed without any deviation from the maintenance instructions. Tasks circumscribed to system components may be performed at the workshop. This can be the case, for example, for avionics functional tests.

Such scenarios should be limited to specific tasks that may not occur often in the maintenance of operational aircraft.

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The use of MSTDs and MTDs for OJT should be restricted to a minimum.

When an existing licence is changed to include an additional category with a type rating, a different OJT from the category held to the new one may be permissible. In those cases, only tasks corresponding to the differences between the two categories should be performed.

The OJT may be partly performed on aircraft whose maintenance is not subject to EMARs (for example, aircraft subject to EASA PARTs) provided that the maintenance is subject to the same procedures and manuals.

A minimum of maintenance activity on aircraft that are subject to EMARs is, however, required in order to gain sufficient insight into the military airworthiness regulatory framework and into release-to-service procedures. The acceptance of the OJT is up to the NMAA.

The organisation that has control over the OJT should provide candidates with a schedule or plan which indicates the list of tasks to be performed under supervision. A record of the completed tasks is to be entered into a logbook whose design and format should be such that each task or group of tasks is countersigned by the corresponding mentor(s).

Regarding day-to-day supervision of the OJT programme in the approved maintenance organisation and the role of the mentor(s), the following should be considered:

- It is sufficient for the completion of the individual OJT tasks to be confirmed by the direct mentor(s), without the direct evaluation of the assessor being necessary.
- During the day-to-day OJT performance, the aim of the supervision is for mentors to oversee the whole process, including task completion, use of manuals, adherence to procedures, observance of safety measures, warnings, cautions and recommendations, and demonstration of appropriate behaviour in the maintenance environment.
- The mentor(s) should personally observe the work being performed to ensure its safe completion and should be readily available for consultation if needed during the OJT.
- The mentor(s) should sign the tasks and release the maintenance tasks as the candidate is still not qualified to do so.
- The mentor(s) should be designated by the approved maintenance organisation to supervise.

For training in release-to-service procedures, following the completion of the performance of a specific task chosen by the mentor, the candidate should prepare a document with simulated release to service which has to be marked as 'for training purposes only' (e.g. ATL page, maintenance task card, CRS). If both the task and the simulated release to service have been performed to the satisfaction of the mentor, the task may be countersigned in the OJT task list by the mentor. A physical or electronic copy of the document with simulated release should be added to the syllabus.

Tasks which are usually performed with more than one person may be performed by more than one candidate under the supervision of one mentor. During the performance of the tasks, the mentor is limited to overseeing three candidates at the same time, given that the candidates can be properly seen 'at a glance' from the mentor's position. Those tasks should be marked as 'group tasks' when applying for the approval. All other tasks should be a one-to-one mentorship. In such cases, all the candidates involved should be noted on the work order.

At the end of the performance of the OJT, a compliance report shall be made which verifies and documents the correct and complete performance and the recommendation of the mentor(s) for the following assessment. The mentor(s) may deny a recommendation if the candidate has not demonstrated the knowledge, skills, behaviour and/or ethics required from certifying staff.

Final assessment of the applicant

The OJT assessment should consist of a theoretical part and a practical part.

The theoretical part comprises the regulatory framework, safety procedures, knowledge of aircraft and its systems, maintenance procedures, and other typical certifying staff activities such as:

- the review and acceptance of work orders;
- shift-handover procedures and team coordination;
- communication and interaction with the flight crew;
- dispatch with unserviceable items;
- clear aircraft logbook entries and reporting notes;
- checks before release to service.

The practical part should include maintenance tasks on the aircraft (e.g. rem./inst., TS, R/I, FOT, MEL dispatch). The assessor may decide to simulate some aspects of the maintenance tasks.

The aircraft type on which the OJT is performed needs to be available for the assessment together with access to the required maintenance data, equipment, and tools. A training aircraft may be acceptable. It is good practice to assess the practical skills on the aircraft in question while the assessment of knowledge may be performed either on the aircraft or in theory.

Further guidance about the designated assessors is provided in the AMC to Appendix III to EMAR 66.

If an independent observer is required for the OJT, they shall be selected by the maintenance organisation among the maintenance personnel that have not taken part in the OJT performance but do have an adequate understanding of the OJT procedures.

APPENDICES TO AMCs TO EMAR 66

Appendix I to AMC to EMAR 66 - Military Aircraft Type Ratings for EMAR 66 Military Aircraft Maintenance Licences

The NMAA is responsible for publishing the military aircraft type ratings that it will endorse on the EMAR Form 26 MAML. It is the responsibility of the EMAR 145 MO to ensure that any certification privileges issued to the MAML holder are appropriate for the military aircraft type rating held (EMAR 145.A.35(b)).

Notes:

When there is a change to a military aircraft type rating (or to an engine designation in the rating) which affects MAMLs already issued, the military aircraft type ratings on the MAML may be modified when the MAML is next submitted to the NMAA for an amendment unless there is an urgent reason to modify the MAML.

The military aircraft type ratings published by an NMAA for the MAML may be subject to change. MAML holders and EMAR 145 MOs should ensure they frequently check the latest version issued by the NMAA.

Appendix II to AMC to EMAR 66 - Aircraft Type Practical Experience and On-the-Job Training - List of Tasks

1) Aircraft type practical experience

Time limits/Maintenance checks

100 hour, “B” or “C” checks or other military equivalent inspection.
Assist carrying out a scheduled maintenance check i.a.w. Aircraft Maintenance Manual.
Review Aircraft maintenance log for correct completion.
Review records for compliance with Airworthiness Directives (or national equivalent).
Review records for compliance with component life limits.
Procedure for inspection following heavy / hard landing.
Procedure for inspection following excessive load factor.
Procedure for inspection following exceeding engine limits.
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.

Leveling/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.

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 pre-flight/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.
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 V/UHF 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 co-axial cable.
Troubleshoot faulty system.
Check SATCOM.

Electrical Power

Charge lead/acid battery.
Charge Ni-Cad battery.
Check battery capacity.
Deep-cycle Ni-Cad battery.
Replace integrated drive/generator/alternator.
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 / cargo 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 smoke detector system.
Check cargo panel sealing.
Install new fire bottle.
Replace fire bottle squib.
Troubleshoot faulty system.
Inspect engine fire wire detection systems.

Flight Controls

Inspect primary flight controls and related components in accordance with 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 Trimmable Horizontal Stabiliser.
Trimmable Horizontal Stabiliser 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.
 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 Total Air Temperature ice protection.
 Operational test of the wing ice protection system.
 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 (FDR).
Replace Cockpit Voice Recorder (CVR).
Replace clock.
Replace master caution unit.
Perform FDR data retrieval.
Troubleshoot faulty system.
Implement Electro-Static Discharge and Soldering procedures.
Inspect for High Intensity Radiated Field requirements.
Start/stop Engine Indication System procedure.
Bite test of the Centralized Fault Display Interface Unit.
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.
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 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 formation lights.
Repair/replace interior lights.
Replace ice inspection lights.
Repair/replace emergency lighting system.
Perform emergency lighting system checks.
Troubleshoot faulty system.

Instruments

Calibrate magnetic direction indicator.
Replace airspeed indicator.
Replace altimeter.
Replace air data computer.
Replace VOR/TACAN unit.
Replace ADI.
Replace HSI.
Check pitot static system for leaks.
Check operation of directional gyro.
Functional check flight director system.
Update flight management system database.
Check calibration of pitot static instruments.

Troubleshoot faulty system.
Compass replacement direct/indirect.

Surveillance

Troubleshoot faulty system.
Functional check weather radar.
Functional check doppler.
Functional check TCAS.
Functional check ATC Transponder.
Check calibration of pressure altitude reporting system.

Navigation

Functional check inertial navigation system.
Complete quadrantal error correction of ADF system.
Check GPS.
Check marker systems.
Functional check DME.

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 in accordance with AMM.
Replace vacuum pump.
Check/replace filters.
Adjust regulator.
Troubleshoot faulty system.

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 Central Maintenance Unit (CMU).
Replace CMU.
Perform Bite check.
Troubleshoot faulty system.

Structures

Assessment of damage.
Sheet metal repair.
Composite material repair.
Treat corrosion.

Apply protective treatment.

Doors

Inspect passenger door in accordance with 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 / cargo / paratroops doors in accordance with AMM.

Remove and install emergency exit in accordance with AMM.

Inspect cargo door in accordance with AMM.

Windows

Replace windshield.

Replace direct vision window.

Replace cabin window.

Repair transparency.

Wings

Skin repair.

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 in accordance with AMM.

Dynamically balance prop.

Troubleshoot faulty system.

Main Rotors

Install rotor assembly.

Replace blades.

Replace damper assembly.

Check track / tabs.

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.
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.
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/boroscope 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 Automatic Mixture Control.
Adjust ABC (Aluminium piston, Brass cylinder, Chrome plated).
Install carburetor/injector.
Adjust carburetor/injector.
Clean injector nozzles.
Replace primer line.
Check carburetor float setting.
Troubleshoot faulty system.

Fuel and control, turbine

Replace FCU.
Replace Engine Electronic Control Unit (FADEC).
Replace Fuel Metering Unit (FADEC).
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 High Tension. 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/igniters.
Check High Tension 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 instrument(s).
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.
Inspect/replace variable nozzle section
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 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.

Attack systems

Replace Head Up Display.
Replace Map / Tactical Situation Display.
Replace Multi-function Display.
Replace Weapons Management Display.
Removal/installation/functional check of laser designator systems.

Surveillance / Image recording / Electronic warfare / Radar / Telemetry

Removal/installation/functional check of FLIR.
Removal/installation/functional check of Electro-Optical cameras.
Removal/installation/functional check of cameras / reconnaissance pods.
Removal/installation of chaff/flares dispenser.
Removal/installation/functional check of Electronic Counter Measures systems.
Removal/installation/functional check of missile warning systems.
Functional check of air to air radar.
Functional check of air to surface / terrain following / mapping radars.
Removal/installation/functional check of telemetry systems.

Weapon systems

Removal/installation of guns/cannons.
Removal/installation of mission specific equipment.
Harmonisation/calibration of weapon aiming devices.
Removal/installation/functional check of interface between mission computer and missiles/bombs/rockets/pods.

Crew escape

Removal/installation of ejection seats.
Removal/installation of crew survival kits.
Inspection of canopy/window jettison devices.

2) List of tasks for OJT

The minimum list of tasks should be selected from the crossed items in the table below according to the following procedures and criteria:

- (i) Filter the S1000D Systems (or subsystems, when required) applicable to the specific aircraft type (add others if they are missing).
- (ii) Identify relevant and significant tasks for each required category of INS, FOT, SGH, R/I, MEL and TS.
- (iii) Retain the required percentage for each task category, and throughout S1000D Systems, as much as relevant to the particular aircraft type.

The selection of tasks should give precedence to tasks which are critical and complex in terms of:

- difficulty to execute;
- interpretation of the maintenance procedures / work instructions;
- specific tools and equipment;
- coordination among maintenance staff (teamwork);
- human factors (accessibility, human–machine interface (HMI), etc.);
- safety impact on the aircraft and the crew.

Removal and installation tasks include the final confirmation test, if required.

Credit may be given for similar tasks between S1000D systems (e.g. pneumatic valves in System 21, 30 and 36), but this should be kept to a minimum.

Some tasks may be performed on another aircraft type as long as both the system and the task are similar.

The following table provides an acceptable method of selection of OJT tasks for B1 and B2 MAML categories, per S1000D Systems or subsystems, as required by point 6.2(e) of Appendix III to EMAR 66.

Glossary of the table: LOC: Location; FOT: Functional/Operational Test; SGH: Service and Ground Handling; R/I: Removal/Installation; MEL: Minimum Equipment List; TS: TroubleShooting.

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Introduction subjects:												
05 Time limits / maintenance checks (see Note below)	X	–	–	–	–	–	X	–	–	–	–	–
06 Dimensions / areas	X	–	–	–	–	–	X	–	–	–	–	–
07 Lifting and shoring	X	–	–	–	–	–	X	–	–	–	–	–
08 Levelling and weighing	–	–	X	–	–	–	X	–	X	–	–	–
09 Towing and taxiing	–	–	X	–	–	–	–	–	X	–	–	–
10 Parking/mooring, storing and return to service	–	–	X	–	–	–	–	–	X	–	–	–
11 Placards and markings	X	–	–	–	–	–	X	–	–	–	–	–
12 Servicing	–	–	X	–	–	–	–	–	X	–	–	–
20 Standard practices — only type particular (System 50 or 60)	X	–	X	–	–	–	X	–	X	–	–	–
Rotorcraft (only):												
18 Vibration and noise analysis (blade tracking)	–	–	–	–	–	X	–	–	–	–	–	–
62 Rotors												
62-10 Rotor blades	X	–	–	X	–	–	–	–	–	–	–	–
62-20 Rotor head(s)	X	–	–	X	–	–	–	–	–	–	–	–
62-30 Rotor shaft(s) / swashplate assy(s)	X	–	–	X	–	–	–	–	–	–	–	–
62-40 Indicating	–	X	X	–	X	X	–	–	–	–	–	X
63 Rotor drives												
63-10 Engine/gearbox couplings	X	–	X	X	–	–	–	–	–	–	–	–
63-20 Gearbox(es)	X	–	X	X	–	–	–	–	–	–	–	–

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
63-30 Mounts, attachments	X	–	X	–	–	–	–	–	–	–	–	–
63-40 Indicating	–	X	–	–	X	X	–	–	–	–	–	X
63-50 Rotor brake	X	–	–	X	–	–	–	–	–	–	–	–
63-60 Drain lines	X	–	–	–	–	–	–	–	–	–	–	–
64 Tail rotor												
64-10 Rotor blades	X	–	X	X	–	–	–	–	–	–	–	–
64-20 Rotor head	X	–	–	X	–	–	–	–	–	–	–	–
64-40 Indicating	–	X	–	X	X	X	–	–	–	–	–	X
65 Tail-rotor drive												
65-10 Shaft	X	–	X	X	–	–	–	–	–	–	–	–
65-20 Gearboxes	X	–	X	X	–	–	–	–	–	–	–	–
65-40 Indicating	–	X	–	–	X	X	–	–	–	–	–	X
66 Folding blades / pylon												
66-10 Rotor blades	X	–	–	X	–	–	–	–	–	–	–	–
66-20 Tail pylon	X	–	–	–	–	–	–	–	–	–	–	–
66-30 Controls and indicating	X	–	–	–	–	X	–	–	–	–	–	X
67 Rotors flight control												
67-10 Rotor	X	–	–	–	–	–	–	–	–	–	–	–
67-20 Antitorque rotor control (yaw control)	X	–	–	–	–	X	–	–	–	–	–	–
67-30 Servocontrol system	X	–	–	–	–	X	–	–	–	–	–	–
Airframe systems:												
21 Air conditioning												
21-10 Compression	–	–	X	X	–	X	–	–	–	–	–	–
21-20 Distribution	–	X	–	X	–	–	–	–	–	–	–	–
21-30 Pressurisation control	–	X	–	X	–	X	–	–	–	–	–	–
21-40 Heating	–	–	–	X	–	–	–	–	–	–	–	–

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
21-50 Cooling	–	–	–	X	–	–	–	–	–	–	–	–
21-60 Temperature control	–	X	–	X	–	X	–	–	–	–	–	–
22 Autoflight												
22-10 Autopilot	–	–	–	–	–	–	–	X	X	X	X	X
22-20 Speed attitude correction	–	–	–	–	–	–	–	X	–	–	–	X
22-30 Autothrottle	–	X	–	–	–	–	X	X	–	X	–	X
22-40 System monitor	–	–	–	–	–	–	–	X	–	–	–	X
22-50 Aerodynamic load alleviatin	–	–	–	–	–	–	–	X	–	–	–	X
23 Communications												
23-10 Speech communications	–	X	–	–	–	–	–	X	–	X	–	X
23-15 SATCOM	–	X	–	–	–	–	X	X	–	X	–	X
23-20 Data transmission and automatic calling	–	X	–	–	–	–	–	X	–	X	–	X
23-30 Passenger address, entertainment and comfort	–	X	–	–	–	–	X	–	–	X	–	X
23-40 Interphone	–	X	–	–	–	–	X	–	–	X	–	X
23-50 Audio integrating	–	X	–	–	–	–	–	X	–	X	–	X
23-60 Static discharging	X	–	–	–	X	–	X	–	–	X	X	X
23-70 Audio and video monitoring	–	X	–	–	–	–	X	X	–	X	–	X
23-80 Integrated automatic tuning	–	–	–	–	–	–	–	X	–	X	–	X
24 Electrical power												
24-10 Generator drive	X	X	X	X	X	X	X	X	–	–	X	X

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
24-20 AC Generation	–	X	–	–	–	X	X	X	–	–	X	X
24-30 DC generation	–	X	–	X	–	X	X	X	–	X	X	X
24-40 External power	X	–	X	–	–	–	X	X	X	–	X	X
24-50 AC electrical load distribution	–	X	–	–	–	X	X	X	–	–	–	X
24-60 DC Electrical load distribution	–	X	–	–	–	X	X	X	–	–	–	X
25 Equipment and furnishings												
25-10 Flight compartment	X	X	X	X	X	–	X	X	–	–	–	–
25-20 Passenger compartment	X	–	–	X	–	–	–	–	–	–	–	–
25-30 Galley	X	X	–	X	–	–	X	X	–	–	–	–
25-40 Lavatories	X	X	–	–	–	–	X	–	–	–	–	–
25-50 Additional compartments	X	X	–	–	–	–	–	–	–	–	–	–
50-00 Cargo accessory compartment	X	–	–	–	–	–	–	–	–	–	–	–
50-10 Cargo compartments	X	–	–	–	–	–	–	–	–	–	–	–
50-20 Cargo loading systems	X	X	–	–	–	X	–	X	–	–	–	X
50-30 Cargo-related systems	X	–	–	–	–	–	–	–	–	–	–	–
50-50 Accessory	X	–	–	–	–	–	–	–	–	–	–	–
50-60 Insulation	X	–	–	–	–	–	–	–	–	–	–	–
25-60 Emergency	X	X	X	X	X	–	–	X	X	–	–	–
26 Fire protection												
26-10 Detection	–	X	–	X	–	X	–	X	–	–	–	X
26-20 Extinguishing	–	X	X	X	–	–	–	–	–	–	–	–
26-30 Explosion suppression	X	–	–	–	–	–	–	–	–	–	–	–

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
27 Flight controls												
27-10 Aileron & tab	X	X	–	X	–	X	–	X	–	–	–	–
27-20 Rudder and tab	X	X	–	X	–	X	–	X	–	–	–	–
27-30 Elevator and tab	X	X	–	X	–	X	–	X	–	–	–	–
27-40 Horizontal stabiliser	X	X	–	X	–	X	–	X	–	–	–	–
27-50 Flaps	X	X	–	X	–	X	–	X	–	–	–	–
27-60 Spoiler, drag devices and variable aerodynamic fairings	X	X	–	X	–	X	–	X	–	–	–	–
27-70 Gust lock and dampener	X	X	X	X	–	X	–	X	–	–	–	–
27-80 Lift augmentin	–	X	X	X	–	X	–	X	–	–	–	–
28 Fuel systems												
28-10 Storage	X	–	X	X	X	–	–	–	X	–	–	–
28-20 Distribution	–	–	–	X	–	–	–	X	–	–	–	–
28-30 Dump	X	–	–	–	–	–	–	–	–	–	–	–
28-40 Indicating	–	X	–	–	–	X	X	X	–	–	–	X
47-00 Nitrogen generation system	X	X	X	X	X	X	–	X	–	–	–	–
29 Hydraulic power												
29-10 Main	X	X	X	X	–	–	–	X	–	–	–	–
29-20 Auxiliary	–	X	X	X	–	–	–	X	–	–	–	–
29-30 Indicating	–	X	–	X	–	X	–	X	–	–	–	X
30 Ice and rain protection												
30-10 Aerofoil	X	X	–	X	–	–	–	–	–	–	–	–
30-20 Air intakes	X	X	–	–	–	–	–	–	–	–	–	–
30-30 Pitot and static	X	–	–	X	–	–	X	X	–	–	–	X
30-40 Windows, windshields and doors	–	X	–	X	–	–	–	X	–	–	–	X

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
30-50 Antennas and radome	X	–	–	X	–	–	X	X	–	–	–	X
30-60 Propellers/rotors	X	–	–	–	–	–	–	–	–	–	–	–
30-70 Water lines	X	–	–	–	–	–	X	–	–	–	–	–
30-80 Detection	–	X	–	X	–	X	–	X	–	–	–	X
31 Indicating/recording systems												
31-10 Instrument and control panels	–	X	–	X	–	–	–	X	–	X	X	X
31-20 Independent instruments	–	X	–	–	–	–	–	X	–	X	–	X
31-30 Recorders	–	X	–	–	–	–	–	X	X	X	–	–
31-40 Central computers	–	–	–	–	–	–	–	X	–	X	–	X
31-50 Central warning systems	–	X	–	–	–	–	–	X	–	X	X	X
31-60 Central display systems	–	X	–	–	–	–	–	X	–	X	–	X
31-70 Automatic data reporting systems	–	–	–	–	–	–	–	X	X	X	–	X
32 Landing gear												
32-10 Main gear and doors	X	X	X	X	–	–	–	–	–	–	–	–
32-20 Nose gear and doors	X	X	X	X	–	–	–	–	–	–	–	–
32-30 Extension and retraction	X	X	–	X	–	X	–	–	–	–	–	–
32-40 Wheels and brakes	X	–	X	X	–	–	–	–	–	–	–	–
32-50 Steering	X	X	X	X	–	X	–	–	–	–	–	–
32-60 Position indication and warning	–	X	–	X	–	X	X	X	–	X	–	X
32-70 Supplementary gear	X	X	X	X	–	–	–	–	–	–	–	–

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OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
33 Lights												
33-10 Flight compartment	X	X	—	X	—	—	X	X	—	X	—	X
33-20 Passenger compartment	X	X	—	X	—	—	X	X	—	X	—	X
33-30 Cargo and service compartments	X	X	—	—	—	—	X	X	—	—	—	X
33-40 Exterior	X	X	—	X	—	—	X	X	—	—	—	X
33-50 Emergency lighting	X	—	—	X	—	—	X	X	—	X	—	X
34 Navigation												
34-10 Flight environment data	—	X	—	—	—	—	—	X	—	—	—	X
34-20 Attitude and direction	—	X	—	—	—	—	—	X	—	X	X	X
34-30 Landing and taxiing aids	—	—	—	—	—	—	—	X	—	X	X	X
34-40 Independent position determining	—	X	—	—	—	—	—	X	—	X	X	X
34-50 Dependent position determining	—	—	—	—	—	—	—	X	—	X	X	X
34-60 Flight management computing	—	X	—	—	—	—	—	X	X	X	X	X
35 Oxygen												
35-10 Crew	X	X	X	X	—	X	—	—	—	—	—	—
35-20 Passengers	X	X	—	X	—	—	—	—	—	—	—	—
35-30 Portable	X	—	—	—	—	—	—	—	—	—	—	—
36 Pneumatic												
36-10 Distribution	X	X	—	X	—	X	—	X	—	—	—	—
36-20 Indicating	—	X	—	X	—	X	X	X	—	—	—	X
37 Vacuum												
37-10 Distribution	—	X	—	X	—	X	—	—	—	—	—	—

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
37-20 Indicating	—	X	—	X	—	X	—	X	—	—	—	X
38 Water/waste												
38-10 Potable	—	X	X	X	—	—	—	X	—	—	—	—
38-20 Wash	—	—	—	—	—	—	—	—	—	—	—	—
38-30 Waste disposal	—	X	X	X	—	—	—	X	—	—	—	—
38-40 Air supply	X	X	—	—	—	—	—	—	—	—	—	—
41 Water ballast												
41-10 Storage	X	—	—	—	—	—	—	—	—	—	—	—
41-20 Dump	X	—	—	—	—	—	—	—	—	—	—	—
41-30 Indication	X	—	—	—	—	—	—	—	—	—	—	X
42 Integrated modular avionics	—	X	—	—	—	—	X	X	X	X	X	X
44 Cabin systems												
44-20 In-flight entertainment system	—	X	—	—	—	—	—	X	—	X	X	X
44-30 External communication system	—	X	—	—	—	—	—	X	—	X	X	X
44-40 Cabin mass memory system	—	—	—	—	—	—	—	X	—	X	X	X
44-50 Cabin monitoring system	—	—	—	—	—	—	—	X	—	X	X	X
44-60 Miscellaneous cabin system	—	—	—	—	—	—	—	X	—	X	X	X
45 Onboard maintenance system	—	X	—	—	—	—	—	X	—	X	X	X
46 Information Systems												
46-10 Aeroplane general information systems	—	—	—	—	—	—	—	X	—	X	X	X
46-20 Flight deck information systems	—	X	—	—	—	—	—	X	—	X	X	X
46-30 Maintenance information systems	—	X	—	—	—	—	—	X	—	X	X	X

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION													
Systems	B1						B2						
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS	
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%	
Subjects:													
46-40 Passenger cabin information systems	—	X	—	—	—	—	—	X	—	X	X	X	
46-50 Miscellaneous information systems	—	—	—	—	—	—	—	X	—	X	X	X	
Airframe structures:													
52 Doors													
52-10 Passenger/crew	X	—	X	X	X	—	—	—	—	—	—	—	
52-20 Emergency exits	X	—	X	X	X	—	—	—	—	—	—	—	
52-30 Cargo	X	—	—	—	—	—	—	—	—	—	—	—	
52-40 Service and miscellaneous	X	—	—	—	—	—	—	—	—	—	—	—	
52-50 Fixed interior	X	—	—	—	—	—	—	—	—	—	—	—	
52-60 Entrance stairs	X	—	—	—	—	—	—	—	—	—	—	—	
52-70 Monitoring and operation	—	X	—	—	—	—	X	X	—	—	—	X	
52-80 Landing gear	X	—	X	—	—	—	—	—	—	—	—	—	
53 Fuselag	X	—	—	—	—	X	—	—	—	—	—	—	
54 Nacelles/pylons	X	—	—	—	—	—	—	—	—	—	—	—	
55 Stabilisers	X	—	—	—	—	—	—	—	—	—	—	—	
56 Windows	X	—	—	—	—	X	—	—	—	—	—	—	
57 Wings	X	—	—	—	—	—	—	—	—	—	—	—	
Auxiliary power units (APUs):													
49 Auxiliar power unit													
49-10 Power plant	X	X	—	X	X	X	—	X	—	—	—	—	
49-20 Engine	X	X	—	X	—	—	—	—	—	—	—	—	
49-30 Engine fuel and control	—	X	—	X	—	—	—	—	—	—	—	—	
49-40 Ignition/starting	—	X	—	—	—	—	X	—	—	—	—	X	
49-50 Air	X	—	—	—	—	—	—	—	—	—	—	—	

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION													
Systems	B1						B2						
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS	
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%	
Subjects:													
49-60 Engine controls	—	—	—	X	—	—	—	—	—	—	—	—	—
49-70 Indicating	—	X	—	—	—	—	—	—	—	—	—	—	—
49-80 Exhaust	X	—	—	—	—	—	—	—	—	—	—	—	—
49-90 Oil	—	—	X	—	—	—	—	—	—	—	—	—	—
Turbine engines:													
70 Standard practices and engine performance	X	—	—	—	—	X	—	—	—	—	—	—	—
71 Power plant	X	—	X	—	—	—	—	—	—	—	—	—	—
71-10 Cowling	X	—	X	X	—	—	—	—	—	—	—	—	—
71-20 Mounts	X	—	—	—	—	—	—	—	—	—	—	—	—
71-30 Fire seals	X	—	—	—	—	—	—	—	—	—	—	—	—
71-40 Attach fittings	X	—	—	—	—	—	—	—	—	—	—	—	—
71-50 Electrical harness	X	X	—	X	—	—	X	—	—	—	—	—	X
71-60 Air intakes	X	—	—	—	—	—	—	—	—	—	—	—	—
72T Engine turbine / turboprop / ducted fan / unducted fan	X	—	X	X	—	—	—	—	—	—	—	—	—
73 Engine fuel and control													
73-10 Distribution	X	—	—	—	—	—	—	—	—	—	—	—	—
73-20 Controlling (FADEC)	X	X	—	X	X	X	—	X	—	—	—	—	X
73-30 Indicating	X	X	—	—	X	—	—	X	—	—	—	—	X
74 Ignition													
74-10 Electrical power	X	X	—	X	—	—	X	X	—	—	—	—	X
74-20 Distribution	X	X	—	—	—	—	X	X	—	—	—	—	X
74-30 Switching	X	X	—	X	—	—	X	X	—	—	—	—	X
75 Air													
75-10 Engine anti-icing	X	X	—	X	X	X	—	—	—	—	—	—	—

EMAR 66 AMC & GM – MILITARY AIRCRAFT MAINTENANCE LICENSING

OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
75-20 Cooling	X	—	—	—	—	—	—	—	—	—	—	—
75-30 Compressor control	—	X	—	—	—	—	—	—	—	—	—	—
75-40 Indicating	—	X	—	—	—	—	—	X	—	—	—	X
76 Engine controls												
76-10 Power control (FADEC)	—	X	—	—	X	—	—	X	—	—	—	X
76-20 Emergency shutdown	—	—	—	—	X	—	—	—	—	—	—	—
77 Engine indicating	—	X	—	—	X	X	X	X	—	—	X	X
78 Exhaust												
78-30 Thrust reverser	X	—	—	X	X	X	—	X	—	—	—	X
79 Oil	X	—	X	X	—	—	—	—	—	—	—	—
80 Starting	X	X	—	X	X	X	—	—	—	—	—	—
83 Accessory gearboxes	X	—	X	X	—	—	—	—	—	—	—	—
Piston engines:												
70 Standard practices and engine performance	X	—	—	—	—	X	—	—	—	—	—	—
71 Power plant	X	—	X	—	—	—	—	—	—	—	—	—
71-10 Cowling	X	—	X	X	—	—	—	—	—	—	—	—
71-20 Mounts	X	—	—	—	—	—	—	—	—	—	—	—
71-30 Fire seal	X	—	—	—	—	—	—	—	—	—	—	—
71-40 Attach fittings	X	—	—	—	—	—	—	—	—	—	—	—
71-50 Electrical harness	X	X	—	X	—	—	X	—	—	—	—	X
71-60 Air intakes	X	—	—	—	—	—	—	—	—	—	—	—
72R Engine — reciprocating	X	—	X	X	—	—	—	—	—	—	—	—
73 Engine fuel and control	X	X	—	X	X	X	—	—	—	—	—	—
73-10 Distribution	X	—	—	—	—	—	—	—	—	—	—	—

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OJT TASK SELECTION												
Systems	B1						B2					
	INS	FOT	SGH	R/I	MEL	TS	INS	FOT	SGH	R/I	MEL	TS
Requirements: % of task categories	75%	50%	50%	50%	25%	25%	75%	50%	50%	50%	25%	25%
Subjects:												
73-20 Controlling (FADEC)	X	X	—	X	X	X	—	X	—	—	—	X
73-30 Indicating	X	X	—	—	X	—	X	X	—	—	—	X
74 Ignition												
74-10 Electrical power	X	X	—	X	—	X	X	X	—	—	—	X
74-20 Distribution	X	X	—	—	—	—	X	X	—	—	—	X
74-30 Switching	X	X	—	X	—	—	X	X	—	—	—	X
76 Engine controls	X	X	—	X	—	X	-	X	—	—	—	X
77 Engine indicating	—	X	—	—	X	X	X	X	—	—	X	X
78 Exhaust	X	—	—	—	—	—	—	—	—	—	—	—
79 Oil	X	—	X	X	—	—	—	—	—	—	—	—
80 Starting	X	X	—	X	X	X	—	—	—	—	—	—
81 Turbines (reciprocating engine)	X	X	X	X	—	—	—	—	—	—	—	—
83 Accessory gearboxes	X	—	X	X	—	—	—	—	—	—	—	—
Propellers:												
61 Propellers/ propulsion												
61-10 Propeller assembly	X	—	X	X	—	—	—	—	—	—	—	—
61-20 Controlling	—	—	—	X	X	—	—	—	—	—	—	—
61-30 Braking	X	—	—	—	—	—	—	—	—	—	—	—
61-40 Indicating	—	X	—	—	X	X	—	X	—	—	—	X
61-50 Propulsor duct	X	—	—	—	—	—	—	—	—	—	—	—
61B Propeller pitch control	—	X	—	X	X	X	—	—	—	—	—	—
61C Propeller synchronising	—	X	—	—	—	X	—	X	—	—	—	X
61D Propeller electronic control	—	X	X	X	X	X	—	X	—	—	—	X
61E Propeller ice protection	X	X	—	—	X	X	—	—	—	—	—	—

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Note: For Military Specific Systems the list of OJT tasks selection should be determined by the MO and approved by the NMAA.

Note: For System 5, select at least one task from category (a), two tasks from category (b), and three tasks from category (c) below:

- (a) Perform and/or assist in performing a scheduled maintenance check:
 - accomplishment of a line maintenance check;
 - accomplishment of a 'daily' or 'weekly', 'service' or equivalent check;
 - active participation in a scheduled check, e.g.: 'A-Check', 'B-Check', 'C-Check' or a base maintenance check.
- (b) Review the aircraft maintenance log for correct completion:
 - closure of MEL/CDL items;
 - dent and buckle chart review, including inspections on fuselage and skin damages assessment in accordance with the SRM;
 - fuel or oil leakage tests.
- (c) Perform unscheduled inspection following:
 - excessive load factor;
 - hard landing;
 - overweight taxiing;
 - bird/hail strike;
 - aborted take-off;
 - high-energy stop;
 - wheel-bearing failure;
 - exceedance of max NLG steering angle;
 - landing gear shimmy/vibrations;
 - lightning strike / HIRF;
 - tail strike;
 - winglet strike;
 - severe turbulence / extreme high winds;
 - airframe vibrations;
 - ice/snow conditions;
 - flight control overspeed down;
 - hot-air duct rupture;
 - relief pressure panels open;
 - mercury spillage;
 - galley spill;
 - hydraulic fluid reaction with titanium;

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- cabin overpressure;
- exceedance of fuel imbalance;
- smoke/fumes in the cabin;
- abnormal doors operations;
- ferry flight maintenance;

- others.

GM1 Appendix II to AMC to Annex III — Aircraft Type Practical Experience and On-the-Job Training — List of Tasks

The following list represents an example of OJT tasks for B1.1 and B2 (Aeroplanes Turbine) MAML categories. The list is not exhaustive, nor tailored to a specific aircraft type, and should be reviewed and adjusted as necessary.

Task No	Systems	Task description	B1.1	B2
1	05 Time limits / maintenance checks	Perform (assist) in A-Check	X	X
2	05 Time limits / maintenance checks	Close MEL/CDL item	X	X
3	05 Time limits / maintenance checks	Review Dent & Buckle chart	X	—
4	05 Time limits / maintenance checks	Perform bird strike inspection	X	—
5	05 Time limits / maintenance checks	Perform lightning strike inspection	X	X
6	05 Time limits / maintenance checks	Perform tail strike inspection	X	—
7	05 Time limits / maintenance checks	Review AD compliance	X	X
8	06 Dimensions/areas	Locate component by station number	X	X
9	07 Lifting and shoring	Jack aircraft wheel	X	—
10	07 Lifting and shoring	Jack the aircraft	X	—
11	08 Levelling and weighing	Level the aircraft	X	—
12	08 Levelling and weighing	Weigh the aircraft (including W&B amendment)	X	—
13	08 Levelling and weighing	Check the aircraft against equipment list	X	X
14	09 Towing and taxiing	Tow the aircraft (including preparation)	X	—
15	10 Parking/mooring, storing & return to service	Park aircraft (including applying applicable protections to parking duration)	X	—
16	10 Parking/mooring, storing & return to service	Position aircraft in dock	X	—
17	11 Placards and markings	Perform placards and markings inspection	X	X
18	12 Servicing	Perform aircraft refuelling (automatic and manual)	X	—

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Task No	Systems	Task description	B1.1	B2
19	12 Servicing	Check and adjust tyre pressure	X	—
20	12 Servicing	Check and replenish hydraulic fluid	X	—
21	12 Servicing	Check and adjust accumulator pressure	X	—
22	12 Servicing	Check and replenish engine oil	X	—
23	12 Servicing	Perform landing gear servicing	X	—
24	12 Servicing	Perform waste / potable water servicing	X	—
25	12 Servicing	Connect ground power	X	X
26	12 Servicing	Lubricate flight control elements	X	—
27	20 Standard practices	Perform aircraft grounding	X	X
28	20 Standard practices	Perform ESDS device inspection	X	X
	21 Air conditioning		...	...
29	21-20 Distribution	Replace recirculation filter	X	—
30	21-40 Heating	Replace combustion heater	X	—
31	21-20 Distribution	Clean outflow valve	X	—
32	21-20 Distribution	Replace outflow valve	X	—
33	21-50 Cooling	Replace ACM / Air cycle unit	X	—
34	21-50 Cooling	Replace heat exchanger	X	—
35	21-30 Pressurisation control	Replace pressurisation controller	X	X
36	21-30 Pressurisation control	Perform pressurisation system functional test	X	X
37	21-20 Distribution	Perform equipment cooling system functional test	X	X
38	21-20 Distribution	Check configuration of AVX compartment ventilation system	X	X
39	21-30 Pressurisation control	Perform air-conditioning system functional test	X	X
40	21-60 Temperature control	Perform temperature control system functional test	X	X
41	21 Air conditioning	Troubleshoot faulty system	X	X
42	22 Autoflight	Replacement of autothrottle servomechanisms components	X	—
43	22 Autoflight	Replace actuator	X	—
44	22 Autoflight	Replace controller	X	X
45	22 Autoflight	Replace amplifier	X	X
46	22 Autoflight	Replace autoflight system LRU	X	X
47	22 Autoflight	Perform yam damper operational test	X	X
48	22 Autoflight	Perform autopilot functional test	X	X
49	22 Autoflight	Perform autopilot gain adjustment	—	X
50	22 Autoflight	Check augmentation system	X	X

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Task No	Systems	Task description	B1.1	B2
51	22 Autoflight	Check operation of autothrottle	X	X
52	22 Autoflight	Perform autoland functional test	X	X
53	22 Autoflight	Check flight management systems	X	X
54	22 Autoflight	Perform Mach trim functional test	—	X
55	22 Autoflight	Upload FM data	X	X
56	22 Autoflight	Troubleshoot faulty system	—	X
57	23 Communications	Perform interphone system operational test	X	X
58	23 Communications	Service interphone components	X	X
59	23 Communications	Replace HF unit	X	X
60	23 Communications	Replace VHF unit	X	X
61	23 Communications	Replace antenna	X	X
62	23 Communications	Perform voice recorder operational test	X	X
63	23 Communications	Replace voice recorder	X	X
64	23 Communications	Perform static discharge components inspection	X	X
65	23 Communications	Perform radio functional test	—	X
66	23 Communications	Perform SELCAL operational test	X	X
67	23 Communications	Perform co-axial cable repair	—	X
68	23 Communications	Perform ELT operational test	X	X
69	23 Communications	Troubleshoot faulty system	—	X
70	24 Electrical power	Supply/remove APU power	X	X
71	24 Electrical power	Remove/install battery	X	X
72	24 Electrical power	Charge battery	X	X
73	24 Electrical power	Perform battery charger operational test	X	X
74	24 Electrical power	Perform standby power system functional test	X	X
75	24 Electrical power	Replace IDG oil filter	X	X
76	24 Electrical power	Remove/install IDG	X	X
77	24 Electrical power	Perform IDG functional test	X	X
78	24 Electrical power	Replace switch	X	X
79	24 Electrical power	Replace CB	X	X
80	24 Electrical power	Replace voltage regulator	—	X
81	24 Electrical power	Perform voltage regulator functional test	X	X
82	24 Electrical power	Perform electrical feeder cable repair	—	X
83	25 Equipment and furnishings	Perform emergency equipment inspection	X	X
84	25 Equipment and furnishings	Replace carpets	X	—

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Task No	Systems	Task description	B1.1	B2
85	25 Equipment and furnishings	Perform crew seats operational test	X	—
86	25 Equipment and furnishings	Replace crew seats	X	—
87	25 Equipment and furnishings	Replace passenger seats	X	—
88	25 Equipment & furnishings	Perform seats and seat belts inspection	X	—
89	25 Equipment & furnishings	Check ELT for compliance with applicable regulations	X	X
90	25 Equipment & furnishings	Perform escape slide inspection	X	—
91	25 Equipment & furnishings	Remove/install escape slide	X	—
92	25 Equipment & furnishings	Perform upholstery repair	X	—
93	25 Equipment & furnishings	Remove/install interior panels	X	—
94	25 Equipment & furnishings	Remove/install cargo compartment panels	X	—
95	25 Equipment & furnishings	Perform cargo loading system inspection	X	—
96	25 Equipment & furnishings	Perform cargo loading system functional test	X	X
97	25 Equipment & furnishings	Replace cargo loading system actuator	X	—
98	26 Fire protection	Check fire bottle content	X	—
99	26 Fire protection	Remove/install fire bottle	X	—
100	26 Fire protection	Replace fire bottle squib	X	—
101	26 Fire protection	Check portable fire-extinguisher content	X	—
102	26 Fire protection	Perform smoke detection system functional test	X	X
103	26 Fire protection	Perform smoke detectors inspection	X	X
104	26 Fire protection	Remove/install smoke detectors	X	X
105	26 Fire protection	Perform fire protection system inspection	X	X
106	26 Fire protection	Perform fire protection system functional test	X	X
107	26 Fire protection	Perform engine fire detection system inspection	X	X
108	26 Fire protection	Troubleshoot faulty system	X	X

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Task No	Systems	Task description	B1.1	B2
109	27 Flight controls	Perform horizontal stabiliser components inspection	X	—
110	27 Flight controls	Perform horizontal stabiliser operational test	X	X
111	27 Flight controls	Remove/install horizontal stabiliser	X	—
112	27 Flight controls	Perform elevator components inspection	X	—
113	27 Flight controls	Perform elevator operational test	X	X
114	27 Flight controls	Remove/install elevator	X	—
115	27 Flight controls	Perform aileron components inspection	X	—
116	27 Flight controls	Perform aileron operational test	X	X
117	27 Flight controls	Remove/install aileron	X	—
118	27 Flight controls	Perform rudder components inspection	X	—
119	27 Flight controls	Perform rudder operational test	X	X
120	27 Flight controls	Remove/install rudder	X	—
121	27 Flight controls	Remove/install trim tab	X	—
122	27 Flight controls	Perform LE flap components inspection	X	—
123	27 Flight controls	Perform LE flap operational test	X	X
124	27 Flight controls	Perform LE devices alternate operation	X	X
125	27 Flight controls	Remove/install LE flap	X	—
126	27 Flight controls	Perform TE flap components inspection	X	—
127	27 Flight controls	Perform TE flap operational test	X	X
128	27 Flight controls	Perform TE devices alternate operation	X	X
129	27 Flight controls	Remove/install TE flap	X	—
130	27 Flight controls	Perform spoiler components inspection	X	—
131	27 Flight controls	Perform spoiler operational test	X	X
132	27 Flight controls	Remove/install spoiler	X	—

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Task No	Systems	Task description	B1.1	B2
133	27 Flight controls	Perform slat component inspection	X	—
134	27 Flight controls	Perform slat operational test	X	X
135	27 Flight controls	Remove/install slat	X	—
136	27 Flight controls	Replace control cable and fittings	X	—
137	27 Flight controls	Perform control cable tension adjustment	X	—
138	27 Flight controls	Remove/install actuator	X	—
139	27 Flight controls	Remove/install powered control unit	X	—
140	27 Flight controls	Perform flight controls functional test	X	X
141	27 Flight controls	Perform stall warning system functional test	X	X
142	27 Flight controls	Perform control column operational test	X	X
143	27 Flight controls	Deactivate/reactivate servo control	X	-
144	27 Flight controls	Check / adjust gearbox oil level	X	-
145	27 Flight controls	Troubleshoot faulty system	X	X
146	28 Fuel systems	Perform fuel/defuel system components inspection	X	—
147	28 Fuel systems	Fuel quantity indicating system functional test	X	X
148	28 Fuel systems	Perform fuel transfer between tanks	X	—
149	28 Fuel systems	Perform booster pump inspection	X	—
150	28 Fuel systems	Remove/install booster pump	X	—
151	28 Fuel systems	Remove/install fuel selector	X	—
152	28 Fuel systems	Perform fuel tank inspection	X	—
153	28 Fuel systems	Remove/install fuel control valve	X	—
154	28 Fuel systems	Remove/install fuel level indicator	X	—
155	28 Fuel systems	Remove/install fuel line	X	—

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Task No	Systems	Task description	B1.1	B2
156	28 Fuel systems	Remove/install flame arrestor	X	—
157	28 Fuel systems	Remove/install water drain valve	X	—
158	28 Fuel systems	Perform fuel content calculation	X	—
159	28 Fuel systems	Check fuel quantity gauge calibration	X	—
160	28 Fuel systems	Perform fuel feed/selectors functional test	X	X
161	28 Fuel systems	Perform fuel dump system functional test	X	X
162	28 Fuel systems	Troubleshoot faulty system	X	X
163	29 Hydraulic power	Perform hydraulic system components inspection	X	—
164	29 Hydraulic power	Check hydraulic system indication	X	x
165	29 Hydraulic power	Perform hydraulic system functional test	X	X
166	29 Hydraulic power	Check auxiliary system indication	X	x
167	29 Hydraulic power	Perform auxiliary system functional test	X	X
168	29 Hydraulic power	Depressurise/pressurise hydraulic reservoirs	X	—
169	29 Hydraulic power	Perform pressurisation module leak check	X	—
170	29 Hydraulic power	Perform shut-off valve operational test	X	X
171	29 Hydraulic power	Replace hydraulic filter	X	—
172	29 Hydraulic power	Replace engine-driven pump	X	—
173	29 Hydraulic power	Replace hydraulic system valve	X	—
174	29 Hydraulic power	Replace hydraulic system line	X	—
175	29 Hydraulic power	Perform power transfer unit operational test	X	X
176	29 Hydraulic power	Remove/install power transfer unit	X	—
177	29 Hydraulic power	Troubleshoot faulty system	X	X
178	30 Ice and rain protection	Perform windshield wiper system components inspection	X	—

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Task No	Systems	Task description	B1.1	B2
179	30 Ice and rain protection	Replace windshield wiper	X	—
180	30 Ice and rain protection	Replace windshield wiper motor	X	—
181	30 Ice and rain protection	Adjust windshield wiper tension	X	—
182	30 Ice and rain protection	Perform ice detection components inspection	X	—
183	30 Ice and rain protection	Check ice detection indication	X	X
184	30 Ice and rain protection	Perform de-icing/anti-icing system components inspection	X	—
185	30 Ice and rain protection	Perform de-icing/anti-icing system functional test	X	X
186	30 Ice and rain protection	Replace de-icing/anti-icing valve	X	—
187	30 Ice and rain protection	Replace solenoid valve	X	X
188	30 Ice and rain protection	Perform probe heating system components inspection	X	—
189	30 Ice and rain protection	Perform probe heating system functional test	X	X
190	30 Ice and rain protection	Perform window heating system component inspection	X	—
191	30 Ice and rain protection	Perform window heating system functional test	X	X
192	30 Ice and rain protection	Troubleshoot faulty system	X	X
193	31 Indicating/recording systems	Perform flight data recorder system components inspection	X	X
194	31 Indicating/recording systems	Perform flight data recorder system operational test	X	X
195	31 Indicating/recording systems	Remove/install flight data recorder	X	X
196	31 Indicating/recording systems	Remove/install clock	X	X
197	31 Indicating/recording systems	Remove/install master caution unit	X	X
198	31 Indicating/recording systems	Perform flight data recorder data retrieval	X	X
199	31 Indicating/recording systems	Perform data acquisition unit functional test	X	X

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Task No	Systems	Task description	B1.1	B2
200	31 Indicating/recording systems	Remove/install data acquisition unit	X	X
201	31 Indicating/recording systems	Perform warning system functional test	X	X
202	31 Indicating/recording systems	Perform EIS operational test	X	X
203	31 Indicating/recording systems	Troubleshoot faulty system	—	X
204	32 Landing gear	Perform tyres and brakes inspection	X	—
205	32 Landing gear	Replace brake unit	X	—
206	32 Landing gear	Perform wheels assembly	X	—
207	32 Landing gear	Perform wheels inspection	X	—
208	32 Landing gear	Replace wheels	X	—
209	32 Landing gear	Replace steering actuator	X	—
210	32 Landing gear	Perform NLG steering rigging	X	—
211	32 Landing gear	Perform autobrake system components inspection	X	—
212	32 Landing gear	Perform autobrake system functional test	X	X
213	32 Landing gear	Perform landing gear alternate brake control components inspection	X	—
214	32 Landing gear	Perform landing gear alternate brake control functional test	X	X
215	32 Landing gear	Perform parking brake components inspection	X	—
216	32 Landing gear	Perform parking brake functional test	X	X
217	32 Landing gear	Perform antiskid operational test	X	X
218	32 Landing gear	Perform landing gear extension/retraction system components inspection	X	—
219	32 Landing gear	Replace landing gear retraction actuator	X	—
220	32 Landing gear	Perform landing gear extension/retraction system functional test	X	X

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Task No	Systems	Task description	B1.1	B2
221	32 Landing gear	Replace uplock/downlock assembly	X	—
222	32 Landing gear	Perform sensor adjustment	X	X
223	32 Landing gear	Perform landing gear operational test	X	X
224	32 Landing gear	Perform landing gear abnormal operational test	X	X
225	32 Landing gear	Replace landing gear door	X	—
226	32 Landing gear	Replace landing gear control cable	X	—
227	32 Landing gear	Replace landing gear safety sensor	X	—
228	32 Landing gear	Replace landing gear shock strut	X	—
229	32 Landing gear	Replace shimmy damper	X	—
230	32 Landing gear	Perform air–ground system functional test	X	X
231	32 Landing gear	Troubleshoot faulty system	X	X
232	33 Lights	Perform interior lights inspection	X	X
233	33 Lights	Perform interior lights operational test	X	X
234	33 Lights	Replace interior lights	X	X
235	33 Lights	Replace push-button switch	X	X
236	33 Lights	Perform cargo lights	X	X
237	33 Lights	Perform cargo lights operational test	X	X
238	33 Lights	Replace cargo lights	X	X
239	33 Lights	Perform exterior lights inspection	X	X
240	33 Lights	Perform exterior lights operational test	X	X
241	33 Lights	Replace exterior lights	X	X
242	33 Lights	Perform emergency lights inspection	X	X
243	33 Lights	Perform emergency lights operational test	X	X

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Task No	Systems	Task description	B1.1	B2
244	33 Lights	Replace emergency lights	X	X
245	33 Lights	Perform landing lights inspection	X	X
246	33 Lights	Perform landing lights operational test	X	X
247	33 Lights	Replace landing lights	X	X
248	33 Lights	Perform navigation lights inspection	X	X
249	33 Lights	Perform navigation lights operational test	X	X
250	33 Lights	Replace navigation lights	X	X
251	33 Lights	Perform logo lights inspection	X	X
252	33 Lights	Perform logo lights operational test	X	X
253	33 Lights	Replace logo lights	X	X
254	33 Lights	Troubleshoot faulty system	X	X
255	34 Navigation	Perform Pitot-static system components inspection	X	X
256	34 Navigation	Replace Pitot-static probe	—	X
257	34 Navigation	Perform static and total air pressure drain fitting	—	X
258	34 Navigation	Perform static pressure port inspection	—	X
259	34 Navigation	Replace static pressure port	—	X
260	34 Navigation	Replace VOR/ILS	—	X
261	34 Navigation	Perform VOR/ILS functional test	—	X
262	34 Navigation	Replace DME	—	X
263	34 Navigation	Perform DME functional test	—	X
264	34 Navigation	Perform inertial reference system functional test	—	X
265	34 Navigation	Replace inertial reference unit	—	X
266	34 Navigation	Perform altimeter functional test	—	X

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Task No	Systems	Task description	B1.1	B2
267	34 Navigation	Replace altimeter	—	X
268	34 Navigation	Perform air data computer functional test	—	X
269	34 Navigation	Replace air data computer	—	X
270	34 Navigation	Perform air speed indicator functional test	—	X
271	34 Navigation	Replace air speed indicator	—	X
272	34 Navigation	Perform weather radar functional test	—	X
273	34 Navigation	Replace weather radar	—	X
274	34 Navigation	Perform TCAS functional test	—	X
275	34 Navigation	Replace TCAS	—	X
276	34 Navigation	Perform ATC transponder functional test	—	X
277	34 Navigation	Replace ATC transponder	—	X
278	34 Navigation	Perform EGPWS functional test	—	X
279	34 Navigation	Replace EGPWS	—	X
280	34 Navigation	Perform ADF functional test	—	X
281	34 Navigation	Replace ADF	—	X
282	34 Navigation	Perform satellite communications system functional test	—	X
283	34 Navigation	Update FM system database	—	X
284	34 Navigation	Perform magnetic compass calibration	X	X
285	34 Navigation	Troubleshoot faulty system	—	X
286	35 Oxygen	Perform crew oxygen system components inspection	X	—
287	35 Oxygen	Service crew oxygen system	X	—
288	35 Oxygen	Perform crew oxygen system functional test	X	X
289	35 Oxygen	Perform passenger oxygen system inspection	X	—

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Task No	Systems	Task description	B1.1	B2
290	35 Oxygen	Service passenger oxygen system	X	—
291	35 Oxygen	Perform passenger oxygen system functional test	X	X
292	35 Oxygen	Replace regulator	X	—
293	35 Oxygen	Replace valve	X	—
294	35 Oxygen	Replace oxygen generator	X	—
295	35 Oxygen	Replace discharge disk	X	—
296	35 Oxygen	Replace protective breathing equipment	X	—
297	35 Oxygen	Perform auto-deployment test	X	X
298	35 Oxygen	Troubleshoot faulty system	X	X
299	36 Pneumatic	Perform pneumatic system components inspection	X	—
300	36 Pneumatic	Perform pneumatic system functional test	X	X
301	36 Pneumatic	Perform pneumatic system leakage test	X	—
302	36 Pneumatic	Replace filter	X	—
303	36 Pneumatic	Replace duct	X	—
304	36 Pneumatic	Remove/install shut-off valve	X	—
305	36 Pneumatic	Remove/install regulating valve	X	—
306	36 Pneumatic	Remove/install regulator	X	—
307	36 Pneumatic	Troubleshoot faulty system	X	X
308	37 Vacuum	Perform vacuum system components inspection	X	—
309	37 Vacuum	Perform vacuum system functional test	X	X
310	37 Vacuum	Replace vacuum pump	X	—
311	37 Vacuum	Remove/install regulator	X	—
312	37 Vacuum	Replace filter	X	—

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Task No	Systems	Task description	B1.1	B2
313	37 Vacuum	Troubleshoot faulty system	X	X
314	38 Water/waste	Perform water system components inspection	X	—
315	38 Water/waste	Perform water system functional test	X	X
316	38 Water/waste	Depressurise/pressurise water tank	X	—
317	38 Water/waste	Replace water pump	X	—
318	38 Water/waste	Replace water faucet	X	—
319	38 Water/waste	Perform water heater operational check	X	—
320	38 Water/waste	Perform waste system components inspection	X	—
321	38 Water/waste	Perform waste system functional test	X	X
322	38 Water/waste	Replace waste pump	X	—
323	38 Water/waste	Replace valve	X	—
324	38 Water/waste	Replace tank	X	—
325	38 Water/waste	Perform lavatory drain valve operational test	X	—
326	38 Water/waste	Troubleshoot faulty system	X	X
327	45 Onboard maintenance system	Perform communications management unit functional test	X	X
328	45 Onboard maintenance system	Replace communications management unit	X	X
329	45 Onboard maintenance system	Perform communications management unit data retrieval	X	X
330	45 Onboard maintenance system	Troubleshoot faulty system	—	X
331	49 Auxiliary Power Unit	Perform APU components inspection	X	—
332	49 Auxiliary Power Unit	Perform APU functional test	X	X
333	49 Auxiliary Power Unit	Record APU data	X	—
334	49 Auxiliary Power Unit	Perform APU start/shutdown	X	X
335	49 Auxiliary Power Unit	Replace APU air inlet door actuator	X	—

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Task No	Systems	Task description	B1.1	B2
336	49 Auxiliary Power Unit	Replace APU air inlet switch	X	—
337	49 Auxiliary Power Unit	Replace APU fuel nozzle	X	—
338	49 Auxiliary Power Unit	Replace APU igniter plug	X	—
339	49 Auxiliary Power Unit	Perform chip detector inspection	X	—
340	49 Auxiliary Power Unit	Perform APU emergency shutdown system functional test	X	X
341	49 Auxiliary Power Unit	Troubleshoot faulty system	X	X
342	51 Structures	Apply protective treatment	X	—
343	52 Doors	Perform entry door components inspection	X	—
344	52 Doors	Perform entry door operational test	X	—
345	52 Doors	Remove/install entry door	X	—
346	52 Doors	Perform crew door components inspection	X	—
347	52 Doors	Perform crew door operational test	X	—
348	52 Doors	Perform emergency exit door components inspection	X	—
349	52 Doors	Perform emergency exit door operational test	X	—
350	52 Doors	Remove/install emergency exit door	X	—
351	52 Doors	Perform cargo door components inspection	X	—
352	52 Doors	Perform cargo door operational test	X	—
353	52 Doors	Perform compartments doors components inspection	X	—
354	52 Doors	Perform compartments doors operational test	X	—
355	52 Doors	Perform snubber replacement	X	—
356	52 Doors	Perform locking mechanism rigging/adjustment	X	—
357	52 Doors	Perform air stair functional test	X	X

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Task No	Systems	Task description	B1.1	B2
358	52 Doors	Perform door warning system functional test	X	X
359	52 Doors	Troubleshoot faulty system	X	X
360	53 Fuselage	Perform radome inspection	X	—
361	53 Fuselage	Perform damage assessment	X	—
362	53 Fuselage	Perform structural repair	X	—
363	54 Nacelles/pylons	Perform nacelle/pylon components inspection	X	—
364	54 Nacelles/pylons	Remove/install nacelle strut	X	—
365	55 Stabilisers	Perform vertical stabiliser inspection	X	—
366	55 Stabilisers	Perform horizontal stabiliser inspection	X	—
367	55 Stabilisers	Perform horizontal stabiliser conductive strip repair	X	—
368	56 Windows	Perform passenger cabin windows inspection	X	—
369	56 Windows	Remove/install passenger window	X	—
370	56 Windows	Perform flight compartment windows inspection	X	—
371	56 Windows	Remove/install flight compartment window	X	—
372	56 Windows	Perform flight compartment windows operational test	X	—
373	57 Wings	Perform wing structure inspection	X	—
374	57 Wings	Replace wing tip	X	—
375	57 Wings	Replace wing rib	X	—
376	57 Wings	Perform wing structural repair	X	—
377	70 Standard practices and engine performance	Perform fluorescent penetrant inspection	X	—
378	70 Standard practices and engine performance	Perform engine wiring harness repair	X	X
379	71 Power plant	Perform power plant components inspection	X	—

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Task No	Systems	Task description	B1.1	B2
380	71 Power plant	Perform powerplant removal/installation	X	—
381	71 Power plant	Replace engine mounts	X	—
382	71 Power plant	Perform FOD inspection	X	—
383	71 Power plant	Remove/install engine harness	X	—
384	71 Power plant	Perform power plant adjustment/test	X	—
385	71 Power plant	Perform (assist) in engine dry motoring	X	—
386	71 Power plant	Perform (assist) in engine run	X	—
387	71 Power plant	Troubleshoot faulty system	X	X
388	72 Engine	Perform fan assembly inspection	X	—
389	72 Engine	Remove/install fan blade	X	—
390	72 Engine	Replace acoustical panel	X	—
391	72 Engine	Perform engine compressor inspection	X	—
392	72 Engine	Perform engine combustion case inspection	X	—
393	72 Engine	Perform engine turbine inspection	X	—
394	72 Engine	Perform gearbox assembly inspection	X	—
395	72 Engine	Perform compressor wash	X	—
396	72 Engine	Perform HPC borescope inspection	X	—
397	72 Engine	Perform hot section borescope inspection	X	—
398	72 Engine	Perform HPT borescope inspection	X	—
399	72 Engine	Remove/install igniter	X	—
400	72 Engine	Remove/install fuel nozzle	X	—
401	72 Engine	Troubleshoot faulty system	X	X
402	73 Engine fuel and control	Perform engine fuel system components inspection	X	—

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Task No	Systems	Task description	B1.1	B2
403	73 Engine fuel and control	Replace engine fuel filters	X	—
404	73 Engine fuel and control	Replace engine-driven pump	X	—
405	73 Engine fuel and control	Perform FADEC functional test	X	—
406	73 Engine fuel and control	Remove/install engine electronic control module/unit	X	—
407	73 Engine fuel and control	Troubleshoot faulty system	X	X
408	74 Ignition	Perform ignition system components visual inspection	X	—
409	74 Ignition	Perform ignition system functional test	X	X
410	74 Ignition	Remove/install igniter plug	X	—
411	74 Ignition	Remove/install ignition exciter	X	—
412	74 Ignition	Troubleshoot faulty system	X	X
413	75 Air	Perform engine air system components inspection	X	—
414	75 Air	Remove/install VSV actuator	X	—
415	75 Air	Remove/install VBV actuator	X	—
416	75 Air	Perform engine air system functional test	X	X
417	76 Engine controls	Perform engine controls components inspection	X	—
418	76 Engine controls	Perform engine controls	X	—
419	76 Engine controls	Perform engine controls functional test	X	X
420	76 Engine controls	Perform thrust lever rigging	X	—
421	76 Engine controls	Remove/install thrust lever	X	—
422	76 Engine controls	Troubleshoot faulty system	X	X
423	77 Engine indicating	Perform engine indicating components inspection	X	—
424	77 Engine indicating	Perform engine indicating functional test	X	X
425	77 Engine indicating	Replace engine instrument	X	X

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Task No	Systems	Task description	B1.1	B2
426	77 Engine indicating	Replace engine thermocouples	X	X
427	77 Engine indicating	Replace oil temperature bulb	X	X
428	77 Engine indicating	Troubleshoot faulty system	X	X
429	78 Exhaust	Perform exhaust components inspection	X	—
430	78 Exhaust	Perform thrust reverser operational test	X	X
431	78 Exhaust	Deactivate/reactivate thrust reverser for maintenance	X	—
432	78 Exhaust	Remove/install thrust reverser	X	—
433	78 Exhaust	Remove/install blocker door	X	—
434	78 Exhaust	Replace shroud assembly	X	—
435	79 Oil	Perform oil system components inspection	X	—
436	79 Oil	Perform oil system functional test	X	X
437	79 Oil	Replace oil filter	X	—
438	79 Oil	Replace oil pump	X	—
439	79 Oil	Replace oil cooler	X	—
440	79 Oil	Remove/install oil pressure sensor	X	X
441	79 Oil	Remove/install oil tank	X	—
442	79 Oil	Troubleshoot faulty system	X	X
443	80 Starting	Perform engine starting system components inspection	X	—
444	80 Starting	Perform engine starting system functional test	X	X
445	80 Starting	Replace engine start valve	X	—
446	80 Starting	Remove/install engine starter	X	—
447	80 Starting	Remove/install starter relay	X	X
448	80 Starting	Troubleshoot faulty system	X	X

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Note: The above example does not contain OJT tasks for Military Specific Systems on purpose as they depend on the aircraft type.

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:

- Knowledge;
- Skills;
- 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 to have 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:

- 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;
- 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
- 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 such as, but not limited to:

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

- What are the success factors for the job?
- What are typical characteristics of a correct behaviour for the task?
- What criteria should be observed?
- What level of expertise is expected?
- Is there any standard available?
- 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”.
- Minimum or maximum time to achieve? Use time effectively and efficiently.
- What if the trainee fails? How many times is the trainee allowed to fail?
- When and how should the trainee be prepared for the assessment?
- What proportion of judgment by the instructor out of collaboration with the trainee is needed during the evaluation stage?

The assessment may be:

- diagnostic (prior to a course), formative (re-orientate the course on areas where there is a need to reinforce) or summative (partial or final evaluation);
- performed task-by-task, as a group of tasks or as a final assessment;

One method might be an initial assessment to be performed by the trainee himself, then discussing areas where the perceptions of the trainee’s performance by the assessors differ in order to:

- develop the self-assessment habits;
- 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.

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 competence of the assessor and highlight the function of the organisation's approval.

3) Who should assess

In order to qualify, the assessor should:

- Be proficient and have sufficient experience and/or knowledge in:
 - human performance and safety culture;
 - the aircraft type;
 - training/coaching/testing skills;
 - instructional tools to use;
- Understand the objective and the content of the practical elements of the training that is being assessed;
- 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 an assessment taking into account the trainee's cultural environment, being constructive, etc.);
- 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 Military Aircraft Type Rating Training; or
- the assessor and the supervisor for the On-the-Job Training

provided that the objectives associated to each role are clearly understood and that the competence and qualification criteria according to the organisation'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 conflict of interests.

When the functions are not combined, the role of each function should be clearly understood.