

EUROPEAN MILITARY AIRWORTHINESS REQUIREMENT

EMAR 66

MILITARY AIRCRAFT MAINTENANCE LICENSING

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NOTES:

Amended paragraphs from EMAR 66 Edition 1.0 are indicated by the use of a 'sidebar' in the margin.

This EMAR relies on definitions laid down in EMAD 1.

The Forms referred to in this document can be found in the EMAR Forms document.

EMAR 66 REVISION STATUS**Commission Regulations reviewed**

The table below details the Implementing Rules (Commission Regulations) reviewed and considered by the MAWA CAWAG (Continuing Airworthiness Advisory Group) for EMAR 66 Ed. 2.0:

Commission Regulation reviewed	Date	Subject
Regulation (EU) No 1321/2014	26 Nov. 2014	Recast, repealing Regulation (EC) No 2042/2003
Regulation (EU) No 2015/1088	03 Jul. 2015	First amending regulation, alleviations for maintenance procedures for general aviation aircraft
Regulation (EU) No 2015/1536	16 Sep. 2015	Second amending regulation, alignment of rules for continuing airworthiness with Regulation (EC) No 216/2008, critical maintenance tasks and aircraft continuing airworthiness monitoring
Regulation (EU) No 2018/1142	14 Aug. 2018	Third amending regulation, introduction of certain categories of aircraft maintenance licences, the modification of the acceptance procedure of components from external suppliers and the modification of the maintenance training organisations' privileges
Regulation (EU) No 2019/1383 and Corrigendum to Regulation (EU) 2019/1383 OJ L 230 of 06.09.2019) and Corrigendum to Regulation (EU) 2019/1383 OJ L 297/83 of 17.11.2022)	08 Jul. 2019	Fourth amending regulation, safety management systems in continuing airworthiness management organisations and alleviations for general aviation aircraft concerning maintenance and continuing airworthiness management
Regulation (EU) No 2019/1384	24 Jul. 2019	Fifth amending regulation, use of aircraft listed on an air operator certificate for non-commercial operations and specialised operations, the establishment of operational requirements for the conduct of maintenance check flights, the establishment of rules on non-commercial operations with reduced cabin crew on board and introducing editorial updates concerning air operations requirements
Regulation (EU) No 2020/270	25 Feb. 2020	Sixth amending regulation, transitional measures for organisations involved in the continuing airworthiness for general aviation and continuing airworthiness management and correcting that Regulation
Regulation (EU) No 2020/1159	05 Aug. 2020	Seventh amending regulation, introduction of new additional airworthiness requirements
Regulation (EU) No 2021/700	26 Mar. 2021	Eighth amending regulation, amending and correcting

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		Regulation (EU) No 1321/2014 as regards the maintenance data and the installation of certain aircraft components during maintenance
Regulation (EU) No 2021/1963	08 Nov. 2021	Ninth amending regulation, amending and correcting Regulation (EU) No 1321/2014 as regards safety management systems in maintenance organisations and correcting that Regulation
Regulation (EU) No 2022/410	10 Mar. 2022	Tenth amending regulation, amending and correcting Regulation (EU) No 1321/2014 as regards the continuing airworthiness management in a single air carrier business grouping
Regulation (EU) No 2022/1360	28 Jul. 2022	Eleventh amending Regulation (EU) No 1321/2014 as regards the implementation of more proportionate requirements for aircraft used for sport and recreational aviation
Regulation (EU) No 2023/989	22 May 2023	Twelfth amending Regulation (EU) No 1321/2014 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks, and correcting that Regulation
Regulation (EU) No 2023/203	27 Oct. 2022	Thirteenth amending Regulation laying down rules for the application of Regulation (EU) 2018/1139 of the European Parliament and of the Council, as regards requirements for the management of information security risks with a potential impact on aviation safety for organisations covered by Commission Regulations (EU) No 1321/2014, (EU) No 965/2012, (EU) No 1178/2011, (EU) 2015/340, Commission Implementing Regulations (EU) 2017/373 and (EU) 2021/664, and for competent authorities covered by Commission Regulations (EU) No 748/2012, (EU) No 1321/2014, (EU) No 965/2012, (EU) No 1178/2011, (EU) 2015/340 and (EU) No 139/2014, Commission Implementing Regulations (EU) 2017/373 and (EU) 2021/664 and amending Commission Regulations (EU) No 1178/2011, (EU) No 748/2012, (EU) No 965/2012, (EU) No 139/2014, (EU) No 1321/2014, (EU) 2015/340, and Commission Implementing Regulations (EU) 2017/373 and (EU) 2021/664

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General

66.1 National Military Airworthiness Authority (NMAA)

- (a) For the purpose of EMAR 66, the NMAA shall be:
 - 1. the authority designated by the pMS.
 - 2. NOT APPLICABLE.
- (b) If applicable, the NMAA shall be responsible for defining:
 - 1. the list of aircraft types, and;
 - 2. what airframe/engine combinations are included in each particular military aircraft type rating.

SECTION A - TECHNICAL REQUIREMENTS

SUBPART A — AIRCRAFT MAINTENANCE LICENCE

66.A.1 Scope

This section defines the Military Aircraft Maintenance Licence (MAML) and establishes the requirements for application, issue and continuation of its validity.

66.A.3 MAML categories and subcategories

MAMLs include the following categories and, where applicable, subcategories and system ratings:

(a) Category A, divided into the following subcategories:

- A1 Aeroplanes Turbine;
- A2 Aeroplanes Piston;
- A3 Helicopters Turbine;
- A4 Helicopters Piston.

(b) Category B1, divided into the following subcategories:

- B1.1 Aeroplanes Turbine;
- B1.2 Aeroplanes Piston;
- B1.3 Helicopters Turbine;
- B1.4 Helicopters Piston.

(c) Category B2

The B2 licence is applicable to all aircraft.

(d) NOT APPLICABLE.

(e) NOT APPLICABLE.

(f) NOT APPLICABLE.

(g) Category C

The C licence is applicable to all aircraft.

66.A.5 Aircraft groups

All military aircraft shall be considered as complex motor-powered aircraft.

66.A.10 Application

(a) An application for a MAML or change to such a licence shall be made on an EMAR Form 19 ([see Appendix V](#)) in a manner established by the NMAA and submitted thereto.

(b) NOT APPLICABLE.

(c) In addition to the documents required in EMAR [66.A.10\(a\)](#) and EMAR [66.B.105](#), as appropriate, the applicant for additional basic categories or subcategories to a MAML

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shall submit his/her current original MAML to the NMAA together with the [EMAR Form 19](#).

- (d) NOT APPLICABLE.
- (e) NOT APPLICABLE.
- (f) Each application shall be supported by documentation to demonstrate compliance with the applicable theoretical knowledge, practical training and experience requirements at the time of application.

66.A.15 Eligibility

An applicant for a MAML shall be at least 18 years of age.

66.A.20 Privileges

- (a) The following privileges shall apply:

1. A category A MAML permits the holder to issue certificates of release to service following minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the certification authorisation referred to in EMAR 145.A.35. The certification privileges shall be restricted to work that the licence holder has personally performed in the Maintenance Organisation (MO) that issued the certification authorisation.

2. A category B1 MAML shall permit the holder to issue certificates of release to service and to act as B1 support staff following:

- maintenance performed on aircraft structure, powerplant, mechanical systems and electrical systems,
- work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

Category B1 includes the corresponding A subcategory.

3. A category B2 MAML shall permit the holder:

(i) to issue certificates of release to service and to act as B2 support staff for following:

- maintenance performed on avionic and electrical systems, and;
- electrical and avionics tasks within powerplant and mechanical systems, requiring only simple tests to prove their serviceability, and;

(ii) to issue certificates of release to service following minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the certification authorisation referred to in EMAR 145.A.35. This certification privilege shall be restricted to work that the MAML holder has personally performed in the MO which issued the certification authorisation and limited to the ratings already endorsed in the B2 MAML.

Category B2 does not include any A subcategory.

- 4. NOT APPLICABLE.
- 5. NOT APPLICABLE.
- 6. NOT APPLICABLE.

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7. A category C MAML shall permit the holder to issue certificates of release to service following base maintenance of the aircraft. The privileges apply to the aircraft in its entirety.
 8. Categories A, B1 and B2 MAMLs can have extensions ([EMAR 66.A.52](#)) to address one or more of the military-specific topics included in Appendix I (Modules 50 - 55). These shall permit the holder to issue certificates of release to service and act as support staff appropriate to the basic knowledge gained from all modules and as approved by the NMAA for maintenance performed on armament, rescue and escape systems and other military-specific systems.
- (b) The holder of a MAML shall not exercise its privileges unless:
1. in compliance with the applicable requirements of EMAR M and EMAR 145; and
 2. in the preceding 2-year period he/she has, either had 6 months of maintenance experience in accordance with the privileges granted by the MAML or, met the provision for the issue of the appropriate privileges; and
 3. he/she has the adequate competence to certify maintenance on the corresponding aircraft; and
 4. he/she is able to read, write and communicate to an understandable level in the language(s) in which the technical documentation and procedures necessary to support the issue of the certificate of release to service are written.

66.A.25 Basic knowledge requirements

- (a) The applicant for a MAML, shall demonstrate by examination a level of knowledge of the related subject modules in accordance with Appendix I.
- (b) The basic knowledge examinations shall comply with the standard set out in Appendix II and shall be conducted by either of the following:
- (1) a Maintenance Training Organisation approved in accordance with EMAR 147;
 - (2) the NMAA;
 - (3) NOT APPLICABLE.
- If the applicant holds an EASA Part 66 licence, the NMAA may accept the EASA licence as a basis, only requiring additional training to cover the differences between the EASA licence and the MAML requirements.
- (c) The basic knowledge examinations shall have been passed within 10 years prior to the application for a MAML or the addition of a category or subcategory to such a MAML. If the basic knowledge examinations have not been passed within that 10-year period, credits for basic knowledge examinations may be alternatively obtained by the applicant in accordance with point (d).
- The 10 years' validity requirement applies to each individual module examination, except for those module examinations which were already passed as part of another licence category and the licence has already been issued.
- (d) The applicant may apply to the NMAA for full or partial credits for the basic knowledge requirements for:
- (1) basic knowledge examinations which were passed more than 10 years before the application for a MAML was submitted (see point (c));

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- (2) any other national technical training and examination considered by the NMAA as equivalent to the corresponding basic knowledge requirements of EMAR 66.

The applicant shall provide evidence of the granted credits by referring to an examination credit report approved by the NMAA in accordance with [Section B, Subpart E](#), of EMAR 66.

- (e) A basic training course without Modules 1 and 2 of [Appendix I](#) is considered a full basic training course approved in accordance with EMAR 147 only when knowledge of those modules is subsequently demonstrated by the applicant by examination and is credited by the NMAA.
- (f) The holder of a MAML applying for the addition of a different category or subcategory shall complement by examination the level of knowledge that is appropriate to the related subject modules in accordance with [Appendix I](#).

[Appendix IV](#) details the modules of Appendix I required for the addition of a new category or subcategory to an existing licence issued in accordance with EMAR 66.

- (g) Modules 50-55 shall be used to provide extensions to a MAML for military-specific systems. Module 53 includes sub-modules that can also be used to provide extensions to a MAML for military-specific systems.

66.A.30 Basic experience requirements

- (a) An applicant for a MAML shall have acquired:

1. for category A, subcategories B1.2 and B1.4:
 - (i) 3 years of practical maintenance experience on operating military aircraft, if the applicant has no previous relevant technical training; or
 - (ii) 2 years of practical maintenance experience on operating military aircraft and completion of training considered relevant by the NMAA as a skilled worker, in a technical trade; or
 - (iii) 6 months of practical maintenance experience on operating military aircraft and completion of a basic training course providing the minimum practical training (as detailed in Column 4 of EMAR 147 Appendix I) approved in accordance with EMAR 147; or
 - (iv) 1 year of practical maintenance experience on operating military aircraft and completion of a basic training course that does not provide the recommended minimum practical training (as defined in Column 4 of EMAR 147 Appendix I) approved in accordance with EMAR 147.

The 1 year of practical maintenance experience can be reduced by the duration of the practical training given during the basic training course with a maximum reduction of 6 months. (Note: as a reference 20 hours of practical training will be considered as being equivalent to a duration of 1 week.).
2. for category B2 and Subcategories B1.1 and B1.3:
 - (i) 5 years of practical maintenance experience on operating military aircraft if the applicant has no previous relevant technical training; or
 - (ii) 3 years of practical maintenance experience on operating military aircraft and completion of training considered relevant by the NMAA as a skilled worker, in a technical trade; or

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- (iii) 2 years of practical maintenance experience on operating military aircraft and completion of a basic training course providing the minimum practical training (as detailed in Column 4 of EMAR 147 Appendix I) approved in accordance with EMAR 147; or
- (iv) 3 years of practical maintenance experience on operating military aircraft and completion of a basic training course that does not provide the recommended minimum practical training (as defined in Column 4 of EMAR 147 Appendix I) approved in accordance with EMAR 147.

The 3 years of practical maintenance experience can be reduced by the duration of the practical training given during the basic training course with a maximum reduction of 1 year. (Note: as a reference 20 hours of practical training will be considered as being equivalent to a duration of 1 week.)

2a. NOT APPLICABLE.

2b. NOT APPLICABLE.

3. for category C:

- (i) 3 years of experience in exercising category B1.1, B1.3 or B2 privileges as support, or both support staff and certifying staff, in accordance with EMAR 145.A.35, at a maintenance organisation, including 12 months of experience as base maintenance support staff; or
- (ii) 5 years of experience in exercising category B1.2 or B1.4 privileges as support staff, or both support staff and certifying staff, in accordance with EMAR 145.A.35, at a maintenance organisation, including 12 months of experience as base maintenance support staff; or
- (iii) for applicants holding an academic degree, 3 years of experience in working in a military aircraft maintenance environment, on a representative selection of tasks that are directly associated with military aircraft maintenance, including 6 months of participation in the performance of base maintenance tasks.
- (iv) NOT APPLICABLE.

4. NOT APPLICABLE.

5. For category C, the academic degree shall be in a relevant technical discipline, issued by a university or any other higher educational institution recognised by the NMAA.

- (b) An applicant for an extension to a MAML shall have a minimum aircraft maintenance experience requirement appropriate to the additional category or subcategory of MAML applied for as defined in [Appendix IV](#) of EMAR 66.
- (c) The experience shall be practical and involve a representative cross section of maintenance tasks on aircraft.
- (d) At least 1 year of the required experience shall be recent maintenance experience on aircraft of the category/subcategory for which the initial MAML is sought. For subsequent category/subcategory additions to an existing MAML, the additional recent maintenance experience required may be less than 1 year but shall be at least 3 months. The required experience shall be dependent upon the difference between the MAML category/subcategory held and applied for. Such additional experience shall be typical of the new MAML category/subcategory sought.

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- (e) Notwithstanding point (a), experience in aircraft maintenance gained outside a military aircraft maintenance environment may be accepted when such maintenance is equivalent to that required by EMAR 66 as established by the NMAA. Additional experience of military aircraft maintenance shall, however, be required to ensure adequate understanding of the military aircraft maintenance environment.
- (f) Experience shall have been acquired within the 10 years preceding the application for a MAML or the addition of a category or subcategory to such a MAML.

66.A.40 Continued validity of the Military Aircraft Maintenance Licence

- (a) The MAML shall be issued for an unlimited duration. It shall remain valid subject to the holder remaining in compliance with the EMAR 66 requirements and the MAML not being suspended, surrendered or revoked.
- (b) NOT APPLICABLE.
- (c) Any certification privilege based upon a MAML becomes invalid as soon as the MAML is invalid.
- (d) The MAML is only valid:
 - (i) when issued and/or changed by the NMAA; and
 - (ii) when the holder has signed the document.
- (e) If the MAML holder's name, service number or state ID number change, the MAML shall be resubmitted to the NMAA within 30 days.

66.A.45 Endorsement with military aircraft ratings

- (a) In order to be entitled to exercise certification privileges on a specific aircraft type, the holder of a MAML needs to have his/her MAML endorsed with the relevant military aircraft ratings.

For category A, no military aircraft type rating is required, subject to compliance with the requirements of EMAR 145.A.35.
- (b) The endorsement of military aircraft type ratings requires the satisfactory completion of one of the following:
 - the relevant category B1, B2 or C military aircraft type training in accordance with [Appendix III to EMAR 66](#);
 - NOT APPLICABLE.

Where relevant, the NMAA may accept an appropriate EASA aircraft type rating as evidence of having undertaken a partial or full equivalent to military aircraft type training.
- (c) For other than category C licences, in addition to the requirement of point (b), the endorsement of the first military aircraft rating within a given category/subcategory requires satisfactory completion of the corresponding On the Job Training (OJT). This OJT shall comply with [Appendix III to EMAR 66](#). Any subsequent military aircraft rating within a given category/subcategory may require further OJT as defined by the NMAA.
- (d) NOT APPLICABLE.
- (e) NOT APPLICABLE.
- (f) NOT APPLICABLE.
- (g) NOT APPLICABLE.

- (h) NOT APPLICABLE.

66.A.50 Limitations

- (a) Limitations introduced on a MAML are exclusions from the certification privileges. If a new military aircraft rating is gained, the MAML limitation(s) shall continue to apply to the new military aircraft rating.
- (b) NOT APPLICABLE.
- (c) For limitations referred to in [EMAR 66.A.70](#), limitations shall be removed upon satisfactory completion of examination on those modules/subjects defined in the applicable conversion report referred to in [EMAR 66.B.300](#).

66.A.52 Extensions for Military Specific Systems

Extensions for Military Specific Systems introduced on a MAML may allow additional certification privileges.

66.A.55 Evidence of qualification

Personnel exercising certification privileges as well as support staff shall produce their MAML, as evidence of qualification, within 72 hours upon request by an official of the NMAA.

66.A.70 Conversion provisions

- (a) The holder of a licence or other qualification for the maintenance of aircraft gained prior to a date established in national regulation shall follow the procedures for conversion into a MAML established by the NMAA according to EMAR 66 [Section B Subpart D](#).
- (b) An individual undergoing a process to gain a licence or other qualification prior to, a date established in national regulation shall follow the procedures for conversion into a MAML established by the NMAA according to EMAR 66 [Section B Subpart D](#).
- (c) Where necessary, the MAML shall contain limitations and/or extensions to reflect the differences between:
- (i) the scope of the licence or other qualification for the maintenance of aircraft and the applicable licence category or subcategory provided for in EMAR 66;
 - (ii) the basic knowledge requirements and the basic examination standards laid down in Appendices I and II to EMAR 66.
- (d) NOT APPLICABLE.

SECTION B - PROCEDURES FOR NATIONAL MILITARY AIRWORTHINESS AUTHORITIES

SUBPART A - GENERAL

66.B.1 Scope

This section establishes the procedures including the administrative requirements to be followed by the NMAA in charge of the implementation and the enforcement of Section A of EMAR 66.

66.B.2 Means of compliance

- (a) The NMAA shall develop Acceptable Means of Compliance (AMC) that may be used to establish compliance with EMARs.
- (b) Alternative Means of Compliance may be used to establish compliance with continuing airworthiness EMARs.
- (c) NOT APPLICABLE.

66.B.10 National Military Airworthiness Authority

(a) General

The pMS shall designate their NMAA with allocated responsibilities for the issuance, continuation, change, suspension or revocation of MAMLs.

This NMAA shall establish an adequate organisational structure to ensure compliance with EMAR 66.

(b) Resources

The NMAA shall be appropriately staffed to ensure the implementation of the requirements of EMAR 66.

(c) Procedures

The NMAA shall establish documented procedures detailing how compliance with EMAR 66 is accomplished. These procedures shall be reviewed and amended to ensure continued compliance.

66.B.15 Information security management system

To be developed later if required.

66.B.20 Record-keeping

- (a) The NMAA shall establish a system of record-keeping that allows adequate traceability of the process to issue, change, suspend or revoke each MAML.
- (b) These records shall include for each MAML:
 1. the application for a MAML or change to that MAML, including all supporting documentation;
 2. a copy of the MAML including any changes;
 3. copies of all relevant correspondence;
 4. details of any exemption and enforcement actions;

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5. any relevant report from other NMAAs or authorities relating to the MAML holder;
 6. the records of examinations conducted by the NMAA;
 7. the applicable conversion report used for conversion;
 8. the applicable credit report used for crediting.
- (c) NOT APPLICABLE.
- (d) Records referred to in points 1 through 8 of point (b) shall be kept for a minimum period of 50 years.

66.B.25 Mutual exchange of information

- (a) If applicable (refer to EMAD R for the exchange of information between NMAAs), the NMAA shall exchange any information with other concerned NMAAs.
- (b) If applicable (refer to EMAD R for the exchange of information between NMAAs) and without prejudice to the competencies of the pMS, in the case of a potential safety threat involving several pMS, the concerned NMAAs shall assist each other in carrying out the necessary oversight action.

66.B.30 Exemptions

All exemptions granted by the NMAA shall be recorded and retained by the NMAA.

SUBPART B - ISSUE OF A MILITARY AIRCRAFT MAINTENANCE LICENCE

This Subpart provides the procedures to be followed by the NMAA to issue or change a MAML.

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

- (a) On receipt of an [EMAR Form 19](#) and any supporting documentation, the NMAA shall verify it for completeness and ensure that the experience claimed meets the requirement of EMAR 66.
- (b) The NMAA shall verify an applicant's examination status and/or confirm the validity of any credits to ensure that all module requirements of [Appendix I](#) have been met as required by EMAR 66.
- (c) When having verified the identity and date of birth of the applicant and being satisfied that the applicant meets the standards of knowledge and experience required by EMAR 66, the NMAA shall issue the relevant MAML to the applicant. The same information shall be kept on NMAA records.
- (d) In the case where aircraft types are endorsed at the time of the issuance of the first MAML, the NMAA shall verify compliance with [EMAR 66.B.115](#).

66.B.105 Procedure for the issue of a MAML via a Maintenance Organisation approved in accordance with EMAR 145

- (a) A Maintenance Organisation approved in accordance with EMAR 145, when authorised to carry out this activity by the NMAA, may:
 - (i) prepare the MAML on behalf of the NMAA; or
 - (ii) make recommendations to the NMAA regarding the application from an individual for a MAML so that the NMAA may prepare and issue such MAML.
- (b) Maintenance Organisations referred to in point (a) shall ensure compliance with [EMAR 66.B.100](#) (a) and (b).
- (c) In all cases, the MAML can only be issued to the applicant by the NMAA.

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

- (a) At the completion of the procedures specified in [EMAR 66.B.100](#) or [EMAR 66.B.105](#), the NMAA shall endorse the additional basic category or subcategory on the MAML by stamp and signature or reissue the licence.
- (b) The record system of the NMAA shall be changed accordingly.
- (c) NOT APPLICABLE.
- (d) The experience and basic knowledge modules or partial modules required for adding a new licence category or subcategory to an existing licence issued in accordance with EMAR 66 are outlined in the tables of [Appendix IV](#).

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

- (a) On receipt of a satisfactory [EMAR Form 19](#) and any supporting documentation demonstrating compliance with the requirements of the applicable rating together with the accompanying MAML, the NMAA shall either:

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1. endorse the applicant's MAML with the applicable military aircraft rating; or
2. reissue the MAML to include the applicable military aircraft rating; or
3. remove the applicable limitations in accordance with [EMAR 66.A.50](#).

The NMAA record system shall be changed accordingly.

- (b) In the case where the complete type training is not conducted by an EMAR 147 Maintenance Training Organisation (e.g. for new aircraft,...), the NMAA shall be satisfied that all type training requirements are complied with before the military aircraft type rating is issued.
- (c) In the case where the OJT is not required, the military aircraft type rating shall be endorsed based on a Certificate of Recognition issued by a Maintenance Training Organisation approved in accordance with EMAR 147.
- (d) In the case where the military aircraft type training is not covered by a single course, the NMAA shall be satisfied prior to the type rating endorsement that the content and length of the courses fully satisfy the scope of the MAML category and that the interface areas have been appropriately addressed.
- (e) In the case of differences training, the NMAA shall be satisfied that:
 - (i) the applicant's previous qualification, supplemented by;
 - (ii) either a course approved in accordance with EMAR 147 or a course directly approved by the NMAA, are acceptable for type rating endorsement.
- (f) The NMAA shall ensure that compliance with the practical elements of the type training is demonstrated by one of the following:
 - (i) by the provision of detailed practical training records or a logbook provided by the organisation which delivered the course directly approved by the NMAA in accordance with [EMAR 66.B.130](#);
 - (ii) where available, by a training certificate covering the practical training element, issued by an EMAR 147 MTO.
- (g) Military aircraft type rating endorsement shall use the military aircraft type ratings specified by the NMAA. The NMAA shall provide details of all the aircraft types/models that are covered by each military aircraft type rating.

66.B.116 Procedure for the change of a MAML to include extensions for Military Specific Systems

- (a) When granting an extension, the NMAA shall ensure that the extension on a MAML results in a level of safety equal to that of the full MAML category. In particular, the NMAA shall define and document which education and training is required for any extension.
- (b) On receipt of a satisfactory [EMAR Form 19](#) and any supporting documentation, the NMAA shall endorse the extension by stamp and signature or reissue the licence.
- (c) The NMAA record system shall be changed accordingly.

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

NOT APPLICABLE.

66.B.125 Procedure for the conversion of MAMLs including group ratings

NOT APPLICABLE.

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

- (a) In the case of type training for military aircraft, the NMAA may approve aircraft type training not conducted by a Maintenance Training Organisation approved in accordance with EMAR 147 (e.g. for old aircraft where there is no more approved MTO,...), pursuant to point 1 of [Appendix III to EMAR 66](#). In such case, the NMAA shall have a procedure to ensure that the aircraft type training complies with [Appendix III to EMAR 66](#).
- (b) NOT APPLICABLE.
- (c) A Certificate of Recognition shall be used for the recognition of completion of either the theoretical elements, the practical elements or both the theoretical and practical elements of the military aircraft type rating training course.

66.B.135 Procedure for the approval of Multimedia-Based Training (MBT) courses

The NMAA, whenever it approves courses, including Multimedia-Based Training¹ (MBT) courses, which are delivered in a physical environment or virtual environment or both, shall verify that the aircraft basic training and the aircraft type training comply with [Appendix I](#) and [Appendix III](#) respectively.

The approval procedure shall include the principles and criteria of [Appendix IX](#).

¹ 'Multimedia-Based Training' by definition uses various media to achieve its training objective.

SUBPART C – EXAMINATIONS

This Subpart provides the procedures to be followed for the examinations conducted by the NMAA.

66.B.200 Examination by the NMAA

- (a) All examination questions shall be kept in a secure manner prior to an examination, to ensure that candidates will not know which particular questions will form the basis of the examination.
- (b) The NMAA shall nominate:
 - 1. persons who control the questions to be used for each examination;
 - 2. examiners who shall be present during all examinations to ensure the integrity of the examination.
- (c) Basic training examinations shall follow the standard specified in [Appendix I](#) and [Appendix II](#).
The Certificate of Recognition (see example in Appendix III to EMAR 147) shall be used to attest completion of basic examinations.
- (d) Type training examinations shall follow the standard specified in [Appendix III](#).
The Certificate of Recognition (see example in Appendix III to EMAR 147) shall be used to attest completion of aircraft type training.
- (e) New essay questions shall be raised at least every 6 months and questions already used withdrawn or rested from use. A record of the questions used shall be retained in the records for reference.
- (f) All examination papers shall be handed out at the start of the examination to the candidate and handed back to the examiner at the end of the allotted examination time period. No examination paper may be removed from the examination room during the allotted examination time period.
- (g) Only the examination documents may be available to the candidate during the evaluation.
- (h) Examination candidates shall be separated from each other so that they cannot read each other's examination papers. They may not speak to any person other than the examiner.
- (i) Candidates who are proven to be cheating shall be banned from taking any further examination within 12 months of the date of the examination in which they were found cheating, unless the NMAA approves otherwise.

SUBPART D – CONVERSION OF LICENCES OR OTHER QUALIFICATIONS

This Subpart provides the procedures for the conversion of licences or other qualifications referred to in [EMAR 66.A.70](#) into MAMLs.

66.B.300 General

- (a) The NMAA may convert licences or other qualifications.
 - (i) NOT APPLICABLE.
 - (ii) NOT APPLICABLE.
- (b) The NMAA may perform the conversion in accordance with a conversion report established pursuant to [EMAR 66.B.305](#) or [EMAR 66.B.310](#), as applicable.
- (c) Conversion reports shall be either
 - (i) developed by the NMAA; or
 - (ii) approved by the NMAA to ensure compliance with EMAR 66.
- (d) Conversion reports together with any change of these shall be kept on record by the NMAA in accordance with [EMAR 66.B.20](#).

66.B.305 Conversion report for licences or other qualifications

- (a) The conversion report for licences or other qualifications into a MAML shall describe the scope of each type of qualification, including the associated licence, if any, the associated privileges and include a copy of the relevant regulations defining these.
- (b) The conversion report shall show for each type of qualification referred to in point (a):
 - 1. to which MAML it will be converted; and
 - 2. which limitations/extensions shall be added in accordance with [EMAR 66.A.70\(c\)](#); and
 - 3. the conditions to remove the limitations, specifying the module/subjects on which examination is needed to remove the limitations and obtain a full MAML, or to include an additional (sub)category. This shall include the modules defined in [Appendix I](#) not covered by the qualification.

66.B.310 Conversion report for approved Maintenance Organisations authorisations

This paragraph applies to the issuance of a MAML to maintenance personnel who hold an MO authorisation allowing them to certify aircraft work but who do not hold a formal qualification as described in [EMAR 66.B.305](#).

- (a) For each approved MO concerned, the conversion report shall describe the scope of each type of authorisation issued by the MO and include a copy of the relevant approved MO's procedures for the qualification and the authorisation of certifying staff on which the conversion process is based.
- (b) The conversion report shall show for each type of qualification referred to in point (a):
 - 1. to which MAML it will be converted; and
 - 2. which limitations/extensions shall be added in accordance with [EMAR 66.A.70\(c\)](#); and
 - 3. the conditions to remove the limitations, specifying the elements/chapters on which examination is needed to remove the limitations and obtain a full MAML,

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or to include an additional (sub)category. This shall include the modules defined in [Appendix III](#) not covered by the national qualification.

SUBPART E – EXAMINATION CREDITS

This Subpart provides the procedures for granting examination credits referred to in [EMAR 66.A.25\(d\)](#).

66.B.400 General

- (a) The NMAA may only grant credit on the basis of a credit report prepared in accordance with [EMAR 66.B.405](#).
- (b) The credit report shall be either
 - (i) developed by the NMAA or
 - (ii) approved by the NMAA to ensure compliance with EMAR 66.
- (c) Credit reports together with any change of these shall be dated and kept on record by the NMAA in accordance with [EMAR 66.B.20](#).
- (d) If applicable (refer to EMAD R for the exchange of information between NMAAs), when an applicant refers to a credit report approved by another NMAA, the NMAA may consider such credit report and seek advice from the other NMAA for the use of the credit report.

66.B.405 Examination credit report

- (a) The credit report shall include a comparison between the following:
 - (i) the modules, submodules, subjects and knowledge levels contained in [Appendix I](#), as applicable; and
 - (ii) the syllabus of the technical qualification concerned, relevant to the particular category being sought.

This comparison shall state whether compliance has been demonstrated and shall contain the justifications for each statement and the possible conditions or additional considerations, or both.

- (b) Credit for examinations, other than basic knowledge examinations carried out in Maintenance Training Organisations approved in accordance with EMAR 147, can only be granted by the NMAA.
- (c) No credit can be granted unless there is a statement of compliance for each module and submodule, indicating where the equivalent standard can be found in the technical qualification.
- (d) The NMAA shall check on a regular basis whether the following have changed:
 - (i) the national qualification standard;
 - (ii) [Appendix I to EMAR 66](#).

The NMAA shall also assess if changes to the credit report are consequently required. Such changes shall be documented, dated and recorded.

66.B.410 Examination credit validity

- (a) The NMAA shall notify to the applicant in writing any credits granted together with the reference to the credit report used.
- (b) Credits shall expire 10 years after they are granted.
- (c) Upon expiration of the credits, the applicant may apply for new credits. The NMAA shall extend the validity of the credits for an additional period of 10 years without

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further consideration if the basic knowledge requirements defined in [Appendix I](#) have not been changed.

SUBPART F – CONTINUING OVERSIGHT

This Subpart describes the procedures for the continuing oversight of the MAML and in particular for the revocation, suspension or limitation of the MAML.

66.B.500 Revocation, suspension or limitation of the MAML

The NMAA shall suspend, limit or revoke the MAML where it has identified a safety issue or if it has clear evidence that the person has carried out or been involved in one or more of the following activities:

1. obtaining the MAML and/or the certification privileges by falsification of documentary evidence;
2. failing to carry out requested maintenance combined with failure to report such fact to the organisation who requested the maintenance;
3. failing to carry out required maintenance resulting from own inspection combined with failure to report such fact to the organisation for which the maintenance was intended to be carried out;
4. negligent maintenance;
5. falsification of the maintenance record;
6. issuing a certificate of release to service for aircraft knowing that the maintenance specified on the certificate of release to service for aircraft has not been carried out or without verifying that such maintenance has been carried out;
7. carrying out maintenance or issuing a certificate of release to service for aircraft when adversely affected by alcohol or drugs;
8. issuing a certificate of release to service for aircraft while not in compliance with continuing airworthiness EMARs.

Appendix I - Basic Knowledge Requirements

1. Knowledge levels for category A, B1, B2 and C Military Aircraft Maintenance Licences

Basic knowledge for categories A, B1 and B2 is indicated by knowledge levels (1, 2 or 3) of each applicable subject. Category C applicants shall meet either the category B1 or the category B2 basic knowledge levels.

The knowledge level indicators are defined on 3 levels as follows:

- **LEVEL 1:** *A familiarisation with the principal elements of the subject.*

Objectives:

- (a) The applicant should be familiar with the basic elements of the subject.
- (b) The applicant should be able to give a simple description of the whole subject, using common words and examples.
- (c) The applicant should be able to use typical terms.

- **LEVEL 2:** *A general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge.*

Objectives:

- (a) The applicant should be able to understand the theoretical fundamentals of the subject.
- (b) The applicant should be able to give a general description of the subject using, as appropriate, typical examples.
- (c) The applicant should be able to use mathematical formulae in conjunction with physical laws describing the subject.
- (d) The applicant should be able to read and understand sketches, drawings and schematics describing the subject.
- (e) The applicant should be able to apply his knowledge in a practical manner using detailed procedures.

- **LEVEL 3:** *A detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.*

Objectives:

- (a) The applicant should know the theory of the subject and interrelationships with other subjects.
- (b) The applicant should be able to give a detailed description of the subject using theoretical fundamentals and specific examples.
- (c) The applicant should understand and be able to use mathematical formulae related to the subject.
- (d) The applicant should be able to read, understand and prepare sketches, simple drawings and schematics describing the subject.
- (e) The applicant should be able to apply his knowledge in a practical manner using manufacturer's instructions.
- (f) The applicant should be able to interpret results from various sources and measurements and apply corrective action where appropriate.

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2. Modularisation

Qualification on basic subjects for each MAML category or subcategory shall be in accordance with the following matrix, where applicable subjects are indicated by an "X", while 'n/a' means that the subject module is neither applicable nor required.:

Subject module	B1.1 A1	B1.2 A2	B1.3 A3	B1.4 A4	B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	
1 Mathematics	X	X	X	X	X
2 Physics	X	X	X	X	X
3 Electrical Fundamentals	X	X	X	X	X
4 Electronic Fundamentals	X (n/a for A1)	X (n/a for A2)	X (n/a for A3)	X (n/a for A4)	X
5 Digital Techniques / Electronic Instrument Systems	X	X	X	X	X
6 Materials and Hardware	X	X	X	X	X
7 Maintenance Practices	X	X	X	X	X
8 Basic Aerodynamics	X	X	X	X	X
9 Human Factors	X	X	X	X	X
10 Aviation Legislation	X	X	X	X	X

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Subject module	B1.1 A1	B1.2 A2	B1.3 A3	B1.4 A4	B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	
11 Aeroplane Aerodynamics, Structures and Systems	X	X	n/a	n/a	n/a
12 Helicopter Aerodynamics, Structures and Systems	n/a	n/a	X	X	n/a
13 Aircraft Aerodynamics, Structures and Systems	n/a	n/a	n/a	n/a	X
14 Propulsion	n/a	n/a	n/a	n/a	X
15 Gas Turbine Engine	X	n/a	X	n/a	n/a
16 Piston Engine	n/a	X	n/a	X	n/a
17 Propeller	X	X	n/a	n/a	n/a
50 Essential Principles of Armament	*	*	*	*	*
51 Weapon Stores System	*	*	*	*	*

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Subject module	B1.1 A1	B1.2 A2	B1.3 A3	B1.4 A4	B2
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	
52 Operational Attack Systems	*	*	*	*	*
53 Surveillance, Image recording, Electronic Warfare and Radar	*	*	*	*	*
54 Crew Safety	*	*	*	*	*
55 Military Communication Systems					*

* - see [EMAR 66.A.25\(g\)](#) for qualification requirements on Modules 50-55 (military-specific systems)

MODULE 1. MATHEMATICS

MODULE 1. MATHEMATICS	Level		
	A	B1 B2	
1.1 Arithmetic	1	2	
1.2 Algebra			
(a) Simple algebraic expressions	1	2	
(b) Equations	-	1	
1.3 Geometry			
(a) Simple geometrical constructions	-	1	
(b) Graphical representation	2	2	
(c) Trigonometry	-	2	

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MODULE 2. PHYSICS

MODULE 2. PHYSICS	Level		
	A	B1 B2	
2.1 Matter	1	2	
2.2 Mechanics	1	2	
2.2.1 Statics			
2.2.2 Kinetics	1	2	
2.2.3 Dynamics	1	2	
(a) Mass, force and energy			
(b) Momentum and conservation of momentum	1	2	
2.2.4 Fluid dynamics	2	2	
(a) Gravity and density			
(b) Viscosity; compressibility on fluids; static, dynamic, and total pressure	1	2	
2.3 Thermodynamics	2	2	
(a) Temperature			
(b) Heat	1	2	
2.4 Optics (Light)	-	2	
2.5 Wave Motion and Sound	-	2	

MODULE 3. ELECTRICAL FUNDAMENTALS

MODULE 3. ELECTRICAL FUNDAMENTALS	Level		
	A	B1 B2	
3.1 Electron Theory	1	1	
3.2 Static Electricity and Conduction	1	2	
3.3 Electrical Terminology	1	2	
3.4 Generation of Electricity	1	1	
3.5 Sources of DC Electricity	1	2	
3.6 DC Circuits	1	2	
3.7 Resistance/Resistor			
(a) Resistance	-	2	
(b) Resistors	-	1	
3.8 Power	-	2	
3.9 Capacitance/Capacitor	-	2	
3.10 Magnetism			
(a) Theory of magnetism	-	2	
(b) Magnetomotive force	-	2	
3.11 Inductance/Inductor	-	2	
3.12 DC Motor/Generator Theory	-	2	
3.13 AC Theory	1	2	
3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits	-	2	
3.15 Transformers	-	2	
3.16 Filters	-	1	
3.17 AC Generators	-	2	
3.18 AC Motors	-	2	

MODULE 4. ELECTRONICS FUNDAMENTALS

MODULE 4. ELECTRONICS FUNDAMENTALS	Level		
	A	B1	B2
4.1 Semiconductors			
4.1.1 Diodes			
(a) Description and characteristics	-	2	2
(b) Operation and function	-	-	2
4.1.2 Transistors			
(a) Description and characteristics	-	1	2
(b) Construction and operation	-	-	2
4.1.3 Integrated Circuits			
(a) Basic description and operation	-	1	2
(b) Description and operation	-	-	2
4.2 Printed Circuit Boards	-	1	2
4.3 Servomechanisms			
(a) Principles	-	1	2
(b) Construction operation and use	-	-	2

MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS

MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS	Level		
	A	B1	B2
5.1 Electronic Instrument Systems	1	1	1
5.2 Numbering Systems	-	1	2
5.3 Data Conversion	-	1	2
5.4 Data Buses	-	2	2
5.5 Logic Circuits			
(a) Identification and applications	-	2	2
b) Interpretation of logic diagrams	-	-	2
5.6 Basic Computer Structure			
(a) Computer terminology and technology	1	2	2
(b) Computer operation	-	-	2
5.7 Microprocessors	-	-	2
5.8 Integrated Circuits	-	-	2
5.9 Multiplexing	-	-	2
5.10 Fibre Optics	-	1	2
5.11 Electronic Displays	1	2	2
5.12 Electrostatic Sensitive Devices	1	2	2
5.13 Software Management Control	-	2	2
5.14 Electromagnetic Environment	-	2	2
5.15 Typical Electronic/Digital Aircraft Systems	1	1	1

MODULE 6. MATERIALS AND HARDWARE

MODULE 6. MATERIALS AND HARDWARE	Level		
	A	B1	B2
6.1 Aircraft Materials — Ferrous			
(a) Alloy steels used in aircraft	1	2	1
(b) Testing of ferrous materials	-	1	1
(c) Repair and inspection procedures	-	2	1
6.2 Aircraft Materials — Non-Ferrous			
(a) Characteristics	1	2	1
(b) Testing of non-ferrous material	-	1	1
(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	1	2	2
(a) Characteristics			
(b) Detection of defects	1	2	-
(c) Repairs and inspection procedures	-	2	1
6.3.2 Wooden structures	-	-	-
6.3.3 Fabric covering	-	-	-
6.4 Corrosion			
(a) Chemical fundamentals	1	1	1
(b) Types of corrosion	2	3	2
6.5 Fasteners			
6.5.1 Screw threads	2	2	2
6.5.2 Bolts, studs and screws	2	2	2
6.5.3 Locking devices	2	2	2
6.5.4 Aircraft rivets	1	2	1

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6.6 Pipes and Unions	2	2	2
(a) Identification			
(b) Standard unions	2	2	1
6.7 Springs	-	2	1
6.8 Bearings	1	2	2
6.9 Transmissions	1	2	2
6.10 Control Cables	1	2	1
6.11 Electrical Cables and Connectors	1	2	2

MODULE 7. MAINTENANCE PRACTICES

MODULE 7. MAINTENANCE PRACTICES	Level		
	A	B1	B2
7.1 Safety Precautions-Aircraft and Workshop	3	3	3
7.2 Workshop Practices	3	3	3
7.3 Tools	3	3	3
7.4 Avionic General Test Equipment	-	2	3
7.5 Engineering Drawings, Diagrams and Standards	1	2	2
7.6 Fits and Clearances	1	2	1
7.7 Electrical Wiring Interconnection System (EWIS)	1	3	3
7.8 Riveting	1	2	-
7.9 Pipes and Hoses	1	2	-
7.10 Springs	1	2	-
7.11 Bearings	1	2	-
7.12 Transmissions	1	2	-
7.13 Control Cables	1	2	-
7.14 Material handling	-	2	-
7.14.1 Sheet Metal	-	2	-
7.14.2 Composite and non-metallic	-	2	-
7.14.3 Additive manufacturing	1	1	1
7.15 Welding, Brazing, Soldering and Bonding			
(a) Soldering methods; inspection of soldered joints	-	2	2
(b) Welding and brazing methods	-	2	-
7.16 Aircraft Weight and Balance	-	2	2
(a) Centre of Gravity calculation	-	2	-
(b) Aircraft weighing	-	2	-
7.17 Aircraft Handling and Storage	2	2	2

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MODULE 7. MAINTENANCE PRACTICES	Level		
	A	B1	B2
7.18 Disassembly, Inspection, Repair and Assembly Techniques			
(a) Types of defects and visual inspection techniques	2	3	3
(b) General repair methods, Structural Repair Manual	-	2	-
(c) Non-destructive inspection techniques	-	2	1
(d) Disassembly and re-assembly techniques	2	2	2
(e) Troubleshooting techniques	-	2	2
7.19 Abnormal Events			
(a) Inspections following lightning strikes and HIRF penetration	2	2	2
(b) Inspections following abnormal events such as heavy landings and flight through turbulence	2	2	-
7.20 Maintenance Procedures	1	2	2
7.21 Documentation & communication	1	2	2
7.22 Armament Safety	2	2	2

MODULE 8. BASIC AERODYNAMICS

MODULE 8. BASIC AERODYNAMICS	Level		
	A	B1 B2	
8.1 Physics of the Atmosphere	1	2	
8.2 Aerodynamics	1	2	
8.3 Theory of Flight	1	2	
8.4 High-speed airflow	1	2	
8.5 Flight Stability and Dynamics	1	2	

MODULE 9. HUMAN FACTORS

MODULE 9. HUMAN FACTORS	Level		
	All		
9.1 General	2		
9.2 Human Performance and Limitations	2		
9.3 Social Psychology	1		
9.4 Factors that affect Performance	2		
9.5 Physical Environment	1		
9.6 Tasks	1		
9.7 Communication	2		
9.8 Human Error	2		
9.9 Safety management	2		
9.10 The 'Dirty Dozen' and risk mitigation	2		

MODULE 10. AVIATION LEGISLATION

MODULE 10. AVIATION LEGISLATION	Level		
	A	B1 B2	
10.1 Regulatory Framework	1	1	
10.2 Certifying Staff — Maintenance	2	2	
10.3 Approved Maintenance Organisations	2	2	
10.4 (Reserved)	-	-	
10.5 Air operations	1	1	
10.6 Certification of Products, parts and appliances	2	2	
10.7 Continuing airworthiness	2	2	
10.8 Oversight principles in continuing airworthiness	1	1	
10.9 (Reserved)	-	-	
10.10 Cybersecurity in aviation maintenance	1	1	

MODULE 11. TURBINE 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	1	1	2	2
(b) Aeroplane, other aerodynamic devices	1	1	2	2
11.2 Airframe Structures (System 51)				
(a) General concepts	2	2	2	2
(b) Airworthiness requirements for structural strength	2	2	2	2
(c) Construction methods	1	1	2	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	2	1
11.3.2 Wings (System 57)	1	1	2	2
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	1	1	3	3
Canopy seal, anti-g system	1	-	2	-
(b) Air supply	1	-	3	-
(c) Air conditioning	1	-	3	-
(d) Safety and warning devices	1	1	3	3
(e) Heating and ventilation system	-	1	-	3

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MODULE 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	Level			
	A1	A2	B1.1	B1.2
11.5 Instruments/Avionic Systems	1	1	2	2
11.5.1 Instrument Systems (System 31)				
11.5.2 Avionic Systems				
Fundamentals of system lay-outs and operation of:				
— Auto Flight (System 22)	1	1	1	1
— Communications (System 23)				
— Navigation Systems (System 34)				
11.6 Electrical Power (System 24)	1	1	3	3
11.7 Equipment and Furnishings (System 25)	2	2	2	2
(a) Emergency equipment				
(b) Cabin and cargo lay-out	1	1	1	1
11.8 Fire Protection (System 26)				
(a) Fire and smoke detection system and fire extinguishing systems	1	1	1	1
(b) Portable fire extinguisher	1	1	1	1
11.9 Flight Controls (System 27)				
(a) Primary and secondary flight controls	1	1	3	2
(b) Actuation and protection	1	-	3	-
(c) System operation	1	-	3	-
(d) Balancing and rigging	1	1	3	3
11.10 Fuel Systems (System 28, System 47)				
(a) System lay-out	1	1	3	3
(b) Fuel handling	1	1	3	3
(c) Indication and warnings	1	1	3	3
(d) Special systems	1	-	3	-
(e) Balancing	1	-	3	-

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MODULE 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	Level			
	A1	A2	B1.1	B1.2
11.11 Hydraulic Power (System 29)				
(a) System description	1	1	3	3
(b) System operation (1)	1	1	3	3
(c) System operation (2)	1	-	3	-
11.12 Ice and Rain Protection (System 30)				
(a) Principles	1	1	3	3
(b) De-icing	1	1	3	3
(c) Anti-icing	1	-	3	-
(d) Wipers	1	1	3	3
(e) Rain-repellent systems	1	-	3	-
11.13 Landing Gear (System 32)				
(a) Description	2	2	3	3
(b) System operation	2	2	3	3
(c) Air-ground sensing	2	-	3	-
(d) Tail protection	2	2	3	3
(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)	1	1	3	3
11.16 Pneumatic/Vacuum (System 36)				
(a) Systems	1	1	3	3
(b) Pumps	1	1	3	3
11.17 Water/Waste (System 38)				
(a) Systems	2	2	3	3
(b) Corrosion	2	2	3	3
11.18 On Board Maintenance Systems (System 45)	1	-	2	-

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MODULE 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	Level			
	A1	A2	B1.1	B1.2
11.19 Integrated Modular Avionics (System 42)				
(a) Overall system description and theory	1	-	2	-
(b) Typical system layouts	1	-	2	-
11.20 Cabin Systems (System 44)	1	-	2	-
11.21 Information Systems (System 46)	1	-	2	-

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

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

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MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	Level	
	A3	B1.3
	A4	B1.4
12.11 Fuel Systems (System 28)	1	3
12.12 Hydraulic Power (System 29)	1	3
12.13 Ice and Rain Protection (System 30)	1	3
12.14 Landing Gear (System 32)		
(a) System description and operation	2	3
(b) Sensors	2	3
12.15 Lights (System 33)	2	3
12.16 Pneumatic/Vacuum (System 36)	1	3
12.17 Integrated Modular Avionics (System 42)		
(a) Overall system description and theory	1	2
(b) Typical system layouts	1	2
12.18 On Board Maintenance Systems (System 45)	1	2
12.19 Information Systems (System 46)	1	2

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEM	Level
	B2
13.1 Theory of Flight	
(a) Aeroplane Aerodynamics and Flight Controls	1
(b) Rotary Wing Aerodynamics	1
13.2 Structures — General Concepts (System 51)	
(a) General concepts	2
(b) Fundamentals of structural systems	1
13.3 Autoflight (System 22)	
(a) Fundamentals of automatic flight control	3
(b) Autothrottle systems and automatic landing systems	3
13.4 Communication/Navigation (System 23/34)	
(a) Fundamentals of communication and navigation systems	3
(b) Fundamentals of aircraft surveillance systems	3
13.5 Electrical Power (System 24)	3
13.6 Equipment and Furnishings (System 25)	3
13.7 Flight Controls	
(a) Primary and secondary flight controls (System 27)	2
(b) Actuation and protection	2
(c) System operation	3
(d) Rotorcraft flight controls (System 67)	2
13.8 Instruments (System 31)	3
13.9 Lights (System 33)	3
13.10 On-Board Maintenance Systems (System 45)	3

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13.11 Air Conditioning and Cabin Pressurisation (System 21)	3
(a) Pressurisation	
Canopy seal and anti-g system	1
(b) Air supply	1
(c) Air Conditioning	3
(d) Safety and warning devices	3
13.12 Fire Protection (System 26)	3
(a) Fire and smoke detection system and fire extinguishing systems	
(b) Portable fire extinguisher	1
13.13 Fuel Systems (System 28, System 47)	1
(a) System lay-out	
(b) Fuel handling	2
(c) Indications and warnings	3
(d) Special systems	2
(e) Balancing	3
13.14 Hydraulic Power (System 29)	1
(a) System lay-out;	
(b) System operation (1)	3
(c) System operation (2)	3
13.15 Ice and Rain Protection (System 30)	2
(a) Principles	
(b) De-icing	3
(c) Anti-icing	2
(d) Wiper systems	1
(e) Rain repellent	1
13.16 Landing Gear (System 32)	1
(a) Description	

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(b) System	3
(c) Air-ground sensing	3
13.17 Oxygen (System 35)	3
13.18 Pneumatic/Vacuum (System 36)	2
13.19 Water/Waste (System 38)	2
13.20 Integrated Modular Avionics (System 42)	3
(a) Overall system description and theory	
(b) Typical system layouts	3
13.21 Cabin Systems (System 44)	3
13.22 Information Systems (System 46)	3

MODULE 14. PROPULSION

MODULE 14. PROPULSION	Level
	B2
14.1 Engines	
(a) Turbine engines	1
(b) Auxiliary power units (APUs)	1
(c) Piston engines	1
(d) Electric and hybrid engines	-
(e) Engine control	2
14.2 Electric/electronic engine indication Systems	2
14.3 Propeller systems	2
14.4 Starting and Ignition Systems	2

MODULE 15. GAS TURBINE ENGINE

MODULE 15. GAS TURBINE ENGINE	Level	
	A1	B1.1
	A3	B1.3
15.1 Fundamentals	1	2
15.2 Engine Performance	-	2
15.3 Inlet	2	2
15.4 Compressors	1	2
15.5 Combustion Section	1	2
15.6 Turbine Section	2	2
15.7 Exhaust	1	2
15.8 Bearings and Seals	-	2
15.9 Lubricants and Fuels	1	2
15.10 Lubrication Systems	1	2
15.11 Fuel Systems	1	2
15.12 Air Systems	1	2
15.13 Starting and Ignition Systems	1	2
15.14 Engine Indication Systems	1	2
15.15 Alternate turbine constructions	-	1
15.16 Turboprop Engines	1	2
15.17 Turboshift Engines	1	2
15.18 Auxiliary Power Units (APUs)	1	2
15.19 Powerplant Installation	1	2
15.20 Fire Protection Systems	1	2
15.21 Engine Monitoring and Ground Operation	1	3
15.22 Engine Storage and Preservation	-	2
15.23 Power Augmentation Systems	1	1

MODULE 16. PISTON ENGINE

MODULE 16. PISTON ENGINE	Level	
	A2	B1.2
	A4	B1.4
16.1 Fundamentals	1	2
16.2 Engine Performance	1	2
16.3 Engine Construction	1	2
16.4 Engine Fuel Systems	1	2
16.4.1 Carburetors		
16.4.2 Fuel injection systems	1	2
16.4.3 Electronic engine control	1	2
16.5 Starting and Ignition Systems	1	2
16.6 Induction, Exhaust and Cooling Systems	1	2
16.7 Supercharging/Turbocharging	1	2
16.8 Lubricants and Fuels	1	2
16.9 Lubrication Systems	1	2
16.10 Engine Indication Systems	1	2
16.11 Powerplant Installation	1	2
16.12 Engine Monitoring and Ground Operation	1	3
16.13 Engine Storage and Preservation	-	2
16.14 Alternative piston engine constructions	-	-

MODULE 17. PROPELLER

MODULE 17 PROPELLER	Level	
	A1	B1.1
	A2	B1.2
17.1 Fundamentals	1	2
17.2 Propeller Construction	1	2
17.3 Propeller Pitch Control	1	2
17.4 Propeller Synchronising	-	2
17.5 Propeller Ice Protection	1	2
17.6 Propeller Maintenance	1	3
17.7 Propeller Storage and Preservation	1	2

MODULES 50 – 55. MILITARY SPECIFIC SYSTEMS

MODULE 50. PRINCIPLES OF ARMAMENT	Level		
	A		
	B1		
	B2		
50.1 Essential principles of Armament			
(a) Propellants and explosives	1		
(b) Missile guidance methods: radar, infrared, electro-optical, passive anti-radiation	1		
(c) Storage, de-stocking and ammunitions assembly	1		

MODULE 51. WEAPONS SYSTEMS	Level		
	A	B1	B2
51.1 Weapons stores system (System 94)			
(a) Weapon and stores release, fire and jettison stores	2	3	3
(b) Weapon control, designating and acquiring a target	1	2	3

MODULE 52. OPERATIONAL ATTACK SYSTEMS	Level		
	A	B1	B2
52.1 Attack System Management (System 39)	-	2	3
52.2 Operational attack functions (System 40)	-	2	3
52.3 Cross-technical attack functions (System 42)	-	2	3

MODULE 53. SURVEILLANCE, IMAGE RECORDING, ELECTRONIC WARFARE, RADAR AND TELEMTRY	Level		
	A	B1	B2
53.1 Surveillance (System 93)	1	2	3
53.2 Image recording (System 97)	1	2	2
(a) Optical systems			
(b) Specificities of aerial photography	1	1	1
53.3 Electronic warfare (System 99)	-	2	3
53.4 Radar (System 92)	-	2	3
53.5 Telemetry (System 96-40)	-	2	3

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MODULE 54. CREW SAFETY	Level		
	A B2	B1	
54.1 Crew escape and safety (System 95)	2	3	

MODULE 55. MILITARY COMMUNICATION SYSTEMS	Level		
	A		B2
	B1		
55.1 Military communication systems	-		3

3. Basic training methods

An appropriate training method, or combination of methods, shall be determined for the entire course or for each of its modules or submodules, with regard to the scope and objectives of each training phase and taking into consideration the benefits and limitations of the available training methods.

Multimedia-Based Training (MBT) methods may be used in order to achieve the training objectives either in a physically or in a virtually controlled environment.

Appendix II - Basic Examination Standard

1. General

- 1.1 All basic examinations shall be carried out using the multi-choice question format and essay questions as specified below. The incorrect alternatives shall seem equally plausible to anyone ignorant of the subject. All of the alternatives shall be clearly related to the question and of similar vocabulary, grammatical construction and length. In numerical questions, the incorrect answers shall correspond to procedural errors such as corrections applied in the wrong sense or incorrect unit conversions: they shall not be mere random numbers.
- 1.2 Each multi-choice question shall have at least three alternative answers of which only one shall be the correct answer and the candidate shall be allowed a time per module which is based upon a nominal average of 75 seconds per question.
- 1.3 Each essay question requires the preparation of a written answer and the candidate shall be allowed 20 minutes to answer each such question.
- 1.4 Suitable essay questions shall be drafted and evaluated using the knowledge syllabus in Appendix I Module 7.
- 1.5 Each question will have a model answer drafted for it, which will also include any known alternative answers that may be relevant for other subdivisions.
- 1.6 The model answer will also be broken down into a list of the important points known as Key Points.
- 1.7 The pass mark for each module and sub-module multi-choice part of the examination is 75 %.
- 1.8 The pass mark for each essay question is 75 % in that the candidates answer shall contain 75 % of the required key points addressed by the question and no significant error related to any required key point.
- 1.9 If either the multi-choice part only or the essay part only is failed, then it is only necessary to retake the multi- choice or essay part, as appropriate.
- 1.10 Penalty marking systems shall not be used to determine whether a candidate has passed.
- 1.11 An examination in a module may not be retaken for at least 90 days following the date of a failed examination in that module, except in the case of a maintenance training organisation approved in accordance with EMAR 147 which delivers a course of retraining tailored to the failed subjects in the particular module; the failed module may be retaken after 30 days, unless approved otherwise by the NMAA.
- 1.12 Basic knowledge examinations with a maximum allowed time of more than 90 or more than 180 minutes may be split in two or three partial exams respectively.
Each partial exam shall:
 - (a) be complementary to the other partial exam or exams taken by the candidate, ensuring that the combination of partial exams meets the examination requirements for the subject module;
 - (b) be of similar allowed time;
 - (c) be passed with 75 % or more of the questions answered correctly;
 - (d) contain a number of questions that is multiple of four;
 - (e) be listed on the same certificate of recognition issued after the last partial exam has been successfully passed. That certificate of recognition shall list

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- the dates and the results of the partial exams – without averaging the results;
- (f) be taken within the same organisation, following the normal examination provisions for retaking failed exams.
- 1.13 The maximum number of attempts for each examination is three in a 12-month period unless approved by the NMAA.
- The applicant shall provide in a written statement to the approved MTO or the NMAA to which they apply for an examination, the number and dates of attempts during the 12 months preceding the examination and the MTO or the NMAA where those attempts took place. The approved MTO or the NMAA is responsible for checking the number of attempts within the applicable timeframes.
- 1.14 While it is accepted that the subject matter of the questions may be the same, the questions used as part of the MBT learning programme shall not be used in examinations.

2. Number of questions per module

2.1 MODULE 1 — MATHEMATICS

Category A: 16 multi-choice, no essay questions.

Time allowed: 20 minutes.

Category B1 and B2: 32 multi-choice, no essay questions.

Time allowed: 40 minutes.

2.2 MODULE 2 — PHYSICS

Category A: 32 multi-choice, no essay questions.

Time allowed: 40 minutes.

Category B1 and B2: 52 multi-choice, no essay questions.

Time allowed: 65 minutes.

2.3 MODULE 3 — ELECTRICAL FUNDAMENTALS

Category A: 20 multi-choice, no essay questions.

Time allowed: 25 minutes.

Category B1 and B2: 52 multi-choice, no essay questions.

Time allowed: 65 minutes.

2.4 MODULE 4 — ELECTRONIC FUNDAMENTALS

Category B1: 20 multi-choice, no essay questions.

Time allowed: 25 minutes.

Category B2: 40 multi-choice, no essay questions.

Time allowed: 50 minutes.

2.5 MODULE 5 — DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS

Category A: 20 multi-choice, no essay questions.

Time allowed: 25 minutes.

Category B1: 40 multi-choice, no essay questions.

Time allowed: 50 minutes.

Category B2: 72 multi-choice, no essay questions.

Time allowed: 90 minutes.

2.6 MODULE 6 — MATERIALS AND HARDWARE

Category A: 48 multi-choice, no essay questions.

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Time allowed: 60 minutes.

Category B1: 72 multi-choice, no essay questions.

Time allowed: 90 minutes.

Category B2: 60 multi-choice, no essay questions.

Time allowed: 75 minutes.

2.7 MODULE 7 — MAINTENANCE PRACTICES

Category A: 80 multi-choice and 2 essay questions.

Time allowed: 100 minutes plus 40 minutes.

Category B1: 88 multi-choice and 2 essay questions.

Time allowed: 110 minutes plus 40 minutes.

Category B2: 68 multi-choice and 2 essay questions.

Time allowed: 85 minutes plus 40 minutes.

2.8 MODULE 8 — BASIC AERODYNAMICS

Category A, B1 and B2: 24 multi-choice, no essay questions.

Time allowed: 30 minutes.

2.9 MODULE 9 — HUMAN FACTORS

Category A, B1 and B2: 28 multi-choice, no essay question.

Time allowed: 35 minutes.

2.10 MODULE 10 — AVIATION LEGISLATION

Category A: 32 multi-choice, no essay question.

Time allowed: 40 minutes.

Category B1 and B2: 36 multi-choice, no essay question.

Time allowed: 45 minutes.

2.11 MODULE 11 — AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

Category A1: 108 multi-choice, no essay questions.

Time allowed: 135 minutes.

Category A2: 72 multi-choice, no essay questions.

Time allowed: 90 minutes.

Category B1.1: 140 multi-choice, no essay questions.

Time allowed: 175 minutes.

Category B1.2: 100 multi-choice, no essay questions.

Time allowed: 125 minutes.

2.12 MODULE 12 — HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

Category A: 100 multi-choice, no essay questions.

Time allowed: 125 minutes.

Category B1.3 and B1.4: 132 multi-choice, no essay questions.

Time allowed: 165 minutes.

2.13 MODULE 13 — AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

Category B2: 188 multi-choice, no essay questions.

Time allowed: 235 minutes.

Questions and time allowed may be split into two examinations as appropriate.

2.14 MODULE 14 — PROPULSION

Category B2: 28 multi-choice, no essay questions.

Time allowed: 35 minutes.

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2.15 MODULE 15 — GAS TURBINE ENGINE

Category A1 and A3: 60 multi-choice, no essay questions.

Time allowed: 75 minutes.

Category B1.1 and B1.3: 92 multi-choice, no essay questions.

Time allowed: 115 minutes.

2.16 MODULE 16 — PISTON ENGINE

Category A2 and A4: 52 multi-choice, no essay questions.

Time allowed: 65 minutes.

Category B1.2 and B1.4: 76 multi-choice, no essay questions.

Time allowed: 90 minutes.

2.17 MODULE 17 — PROPELLER

Category A1 and A2: 20 multi-choice, no essay questions.

Time allowed: 25 minutes.

Category B1.1 and B1.2: 32 multi-choice, no essay questions.

Time allowed: 40 minutes.

2.18 MODULE 50 — PRINCIPLES OF ARMAMENT

Category A, B1 and B2: 12 multi-choice, no essay question.

Time allowed: 15 minutes.

2.19 MODULE 51 — WEAPONS SYSTEMS

Category A: 24 multi-choice, no essay question.

Time allowed: 30 minutes.

Category B1: 28 multi-choice, no essay question.

Time allowed: 35 minutes.

Category B2: 32 multi-choice, no essay question.

Time allowed: 40 minutes.

2.20 MODULE 52 — OPERATIONAL ATTACK SYSTEMS

Category B1: 48 multi-choice, no essay question.

Time allowed: 60 minutes.

Category B2: 80 multi-choice, no essay question.

Time allowed: 100 minutes.

2.21 MODULE 53 — SURVEILLANCE, IMAGE RECORDING, ELECTRONIC WARFARE, RADAR AND TELEMETRY

Category A: 12 multi-choice, no essay question.

Time allowed: 15 minutes.

Category B1: 36 multi-choice, no essay question.

Time allowed: 45 minutes.

Category B2: 52 multi-choice, no essay question.

Time allowed: 65 minutes.

2.22 MODULE 54 — CREW SAFETY

Category A and B2: 16 multi-choice, no essay question.

Time allowed: 20 minutes.

Category B1: 20 multi-choice, no essay question.

Time allowed: 25 minutes.

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2.23 MODULE 55 — MILITARY COMMUNICATION SYSTEMS

Category B2: 16 multi-choice, no essay question.

Time allowed: 20 minutes.

Appendix III - Military aircraft type training and type evaluation standard - On-the-Job Training (OJT)

1. General

Military aircraft type training shall consist of theoretical training and examination, and, except for the category C ratings, practical training and assessment. Where military aircraft type training includes military-specific systems, the prerequisite is that the student shall have gained the relevant 50-series modules (or sub-modules) of [EMAR 66 Appendix I](#).

(a) Theoretical training and examination shall comply with the following requirements:

(i) Shall be conducted by a MTO appropriately approved in accordance with EMAR 147 or an organisation recognised by the NMAA in accordance with [EMAR 66.B.130](#).

(ii) Shall comply with the standard set out in points 3.1 and 4 of this Appendix III and, if existing, the elements defined in the operational suitability data (OSD) established in accordance with EMAR 21.

(iii) In the case of a category C person qualified by holding an academic degree as specified in EMAR 66.A.30(a)(5), the first relevant aircraft type theoretical training shall be at the category B1 or B2 level or at a level recognised by the NMAA.

(iv) Shall have been started and completed within the 3 years preceding the application for a military aircraft type rating endorsement.

(b) Practical training and assessment shall comply with the following requirements:

(i) Shall be conducted by a MTO appropriately approved in accordance with EMAR 147 or an organisation recognised by the NMAA in accordance with [EMAR 66.B.130](#).

(ii) Shall comply with the standard set out in points 3.2 and 4 of this Appendix III and, if existing, the elements defined in the OSD established in accordance with EMAR 21.

(iii) Shall include a representative cross section of maintenance activities relevant to the aircraft type.

(iv) Shall include demonstrations using equipment, components, maintenance simulation training devices (MSTDs), maintenance training devices (MTDs) or real aircraft.

(v) Shall have been started and completed within the 3 years preceding the application for a military aircraft type rating endorsement.

(c) Differences training

(i) Differences training is the training required to cover the training differences between:

(a) two different military aircraft type ratings of the same manufacturer as determined by the NMAA; or

(b) two different licence categories in respect of the same aircraft type rating.

(ii) Differences training has to be defined on a case-by-case basis taking into account the requirements contained in this Appendix III in respect of both theoretical and practical elements of military aircraft type rating training.

(iii) A military aircraft type rating shall only be endorsed on a MAML after differences training when the applicant also complies with one of the following conditions:

- having already endorsed on the MAML the military aircraft type rating from which the differences are being identified, or

- having completed the military aircraft type rating requirements for the aircraft from which the differences are being identified.

(iv) the differences training shall have been started and completed within 3 years preceding the application for the new military aircraft type rating in the same category

(case (a)) or in another category (case (b)).

2. Military aircraft type training levels

The three levels listed below define the objectives, the depth of training and the level of knowledge that the training is intended to achieve.

- **Level 1:** A brief overview of the airframe, systems and powerplant as outlined in the Systems Description Section of the Aircraft Maintenance Manual/Instructions for Continuing Airworthiness.

Course objectives: Upon completion of Level 1 training, the student will be able to:

- (a) provide a simple description of the whole subject, using common words and examples, using typical terms and identify safety precautions related to the airframe, its systems and powerplant;
- (b) identify aircraft manuals, maintenance practices important to the airframe, its systems and powerplant;
- (c) define the general layout of the aircraft's major systems;
- (d) define the general layout and characteristics of the powerplant;
- (e) identify special tooling and test equipment used with the aircraft.

- **Level 2:** Basic system overview of controls, indicators, principal components, including their location and purpose, servicing and minor troubleshooting. General knowledge of the theoretical and practical aspects of the subject.

Course objectives: In addition to the information contained in the Level 1 training, at the completion of Level 2 training, the student will be able to:

- (a) understand the theoretical fundamentals; apply knowledge in a practical manner using detailed procedures;
- (b) recall the safety precautions to be observed when working on or near the aircraft, powerplant, systems and armaments;
- (c) describe systems and aircraft handling particularly access, power availability and sources;
- (d) identify the locations of the principal components;
- (e) explain the normal functioning of each major system, including terminology and nomenclature;
- (f) perform the procedures for servicing associated on aircraft systems;
- (g) demonstrate proficiency in use of crew reports and on-board reporting systems (minor troubleshooting) and determine aircraft airworthiness per the MEL/CDL or National equivalent;
- (h) demonstrate the use, interpretation and application of appropriate documentation including instructions for continuing airworthiness, maintenance manual, illustrated parts catalogue, etc.

- **Level 3:** Detailed description, operation, component location, removal/installation and BITE and troubleshooting procedures to maintenance manual level.

Course objectives: In addition to the information contained in Level 1 and Level 2 training, at the completion of Level 3 training, the student will be able to:

- (a) demonstrate a theoretical knowledge of aircraft systems and structures and interrelationships with other systems, provide a detailed description of the subject using theoretical fundamentals and specific examples and to interpret results from various

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sources and measurements and apply corrective action where appropriate;

(b) perform system, powerplant, component and functional checks as specified in the aircraft maintenance manual;

(c) demonstrate the use, interpret and apply appropriate documentation including structural repair manual, troubleshooting manual, etc.;

(d) correlate information for the purpose of making decisions in respect of fault diagnosis and rectification to maintenance manual level;

(e) describe procedures for replacement of components unique to aircraft type.

3. Military aircraft type training standard

Although military aircraft type training includes both theoretical and practical elements, courses can be approved for the theoretical element, the practical element or for a combination of both.

An appropriate training method, or combination of training methods, shall be determined for the entire course or for each of its parts with regard to the scope and objectives of each training phase and taking into consideration the benefits and limitations of the available training methods.

Multimedia-based training (MBT) methods may be used in order to achieve the training objectives either in a physically or in a virtually controlled environment.

3.1 Theoretical element

(a) Objective:

On completion of a theoretical training course the student shall be able to demonstrate, to the levels identified in the Appendix III syllabus, the detailed theoretical knowledge of the aircraft's applicable systems, structure, operations, maintenance, repair, and troubleshooting in accordance with approved maintenance data. The student shall be able to demonstrate the use of manuals and approved procedures, including the knowledge of relevant inspections and limitations.

(b) Level of training:

Training levels are those levels defined in point 2 above.

After the first type course for category C certifying staff, all subsequent courses need only be to level 1.

During a level 3 theoretical training, level 1 and 2 training material may be used to teach the full scope of the chapter if required. However, during the training the majority of the course material and training time shall be at level 3.

(c) Duration:

NOT APPLICABLE.

(d) Justification of course duration:

Training courses carried out in a MTO approved in accordance with EMAR 147 and courses directly approved by the NMAA shall justify their hour duration and the coverage of the full syllabus by a training needs analysis based on:

- the design of the aircraft type, its maintenance needs and the types of operation,
- detailed analysis of applicable chapters — see contents table in point 3.1(e) below,
- detailed competency analysis showing that the objectives as stated in point 3.1(a) above are fully met.

Course duration shall be approved by the NMAA.

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Similarly, tuition hours of differences courses or other training course combinations (such as combined B1/B2 courses), and in cases of theoretical Military Type Training courses, these shall be justified by the training needs analysis as described above.

In addition, the course must describe and justify the following:

- The minimum physical and/or virtual classroom attendance required of the trainee, in order to meet the objectives of the course.
- The maximum number of hours of physical and/or virtual classroom training per day, taking into account pedagogical and human factors principles.

If the minimum attendance required is not met, the certificate of recognition shall not be issued. Additional training may be provided by the MTO in order to meet the minimum attendance time.

(e) Content:

As a minimum, the elements in the Syllabus (see table below) that are specific to the aircraft type shall be covered. Additional elements introduced due to type variations, technological changes, etc. shall also be included.

If it exists, the minimum syllabus of the operational suitability data (OSD), established in accordance with EMAR 21, shall be included.

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
Introduction module:									
05 Time limits/maintenance checks	1	1	1	1	1	1	1	1	1
06 Dimensions/Areas (MTOM, etc.)	1	1	1	1	1	1	1	1	1
07 Lifting and Shoring	1	1	1	1	1	1	1	1	1
08 Levelling and weighing	1	1	1	1	1	1	1	1	1
09 Towing and taxiing	1	1	1	1	1	1	1	1	1
10 Parking/mooring, Storing and Return to Service	1	1	1	1	1	1	1	1	1
11 Placards and Markings	1	1	1	1	1	1	1	1	1
12 Servicing	1	1	1	1	1	1	1	1	1
14 Product loading and off loading	1	1	1	1	1	1	1	1	1
20 Standard practices including armament safety — only type particular	1	1	1	1	1	1	1	1	1
Helicopters									
18 Vibration and Noise Analysis (Blade tracking)	-	-	-	-	3	1	3	1	-
25 Emergency Flotation Equipment	-	-	-	-	3	1	3	1	1
53 Airframe Structure (Helicopter)	-	-	-	-	3	1	3	1	-
60 Standard Practices Rotor	-	-	-	-	3	1	3	1	-
62 Rotors	-	-	-	-	3	1	3	1	1
62A Rotors — Monitoring and indicating	-	-	-	-	3	1	3	1	3
63 Rotor Drives	-	-	-	-	3	1	3	1	1
63A Rotor Drives — Monitoring and indicating	-	-	-	-	3	1	3	1	3
64 Tail Rotor	-	-	-	-	3	1	3	1	1
64A Tail rotor — Monitoring and indicating	-	-	-	-	3	1	3	1	3
65 Tail Rotor Drive	-	-	-	-	3	1	3	1	1
65A Tail Rotor Drive — Monitoring and indicating	-	-	-	-	3	1	3	1	3
66 Folding Blades/Pylon	-	-	-	-	3	1	3	1	-
67 Rotors Flight Control	-	-	-	-	3	1	3	1	-

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
Airframe structures									
51 Standard practices and structures (damage classification, assessment and repair)	3	1	3	1	-	-	-	-	1
52 Doors	3	1	3	1	-	-	-	-	1
53 Fuselage	3	1	3	1	-	-	-	-	1
54 Nacelles/Pylons	3	1	3	1	-	-	-	-	1
55 Stabilisers	3	1	3	1	-	-	-	-	1
56 Windows and canopies	3	1	3	1	-	-	-	-	1
57 Wings	3	1	3	1	-	-	-	-	1
Zonal and Station Identification Systems.	1	1	1	1	1	1	1	1	1
Airframe systems:									
21 Air Conditioning	3	1	3	1	3	1	3	1	3
21A Air Supply	3	1	3	1	3	1	3	1	2
21B Pressurisation	3	1	3	1	3	1	3	1	3
21C Safety and Warning Devices	3	1	3	1	3	1	3	1	3
22 Autoflight	2	1	2	1	2	1	2	1	3
23 Communications	2	1	2	1	2	1	2	1	3
24 Electrical Power	3	1	3	1	3	1	3	1	3
25 Equipment and Furnishings	3	1	3	1	3	1	3	1	1
25A Electronic Equipment including emergency equipment	1	1	1	1	1	1	1	1	3
26 Fire Protection	3	1	3	1	3	1	3	1	3
27 Flight Controls	3	1	3	1	3	1	3	1	2
27A Sys. Operation: Electrical/Fly-by-Wire	3	1	-	-	-	-	-	-	3
28 Fuel Systems	3	1	3	1	3	1	3	1	2
28A Fuel Systems — Monitoring and indicating	3	1	3	1	3	1	3	1	3
29 Hydraulic Power	3	1	3	1	3	1	3	1	2
29A Hydraulic Power — Monitoring and indicating	3	1	3	1	3	1	3	1	3

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
30 Ice and Rain Protection	3	1	3	1	3	1	3	1	3
31 Indicating/Recording Systems	3	1	3	1	3	1	3	1	3
31A Instrument Systems	3	1	3	1	3	1	3	1	3
32 Landing Gear	3	1	3	1	3	1	3	1	2
32A Landing Gear — Monitoring and indicating	3	1	3	1	3	1	3	1	3
33 Lights	3	1	3	1	3	1	3	1	3
34 Navigation	2	1	2	1	2	1	2	1	3
35 Oxygen	3	1	3	1	-	-	-	-	2
36 Pneumatic	3	1	3	1	3	1	3	1	2
36A Pneumatic — Monitoring and indicating	3	1	3	1	3	1	3	1	3
37 Vacuum	3	1	3	1	3	1	3	1	2
38 Water/Waste	3	1	3	1	-	-	-	-	2
40 Operational attack functions	2	1	2	1	2	1	-	-	3
41 Water Ballast	3	1	3	1	-	-	-	-	1
42 Integrated modular avionics	2	1	2	1	2	1	2	1	3
42A Cross-technical attack functions	2	1	2	1	2	1	-	-	3
44 Cabin Systems	2	1	2	1	2	1	2	1	3
45 On-Board Maintenance System (or covered in 31)	3	1	3	1	3	1	-	-	3
46 Information Systems	2	1	2	1	2	1	2	1	3
47 Nitrogen generation system	3	1	3	1	-	-	-	-	2
48 In-Flight refueling tanker	3	1	-	-	3	1	-	-	2
48A In-Flight refueling tanker – Monitoring and Indicating	3	1	-	-	3	1	-	-	3
50 Cargo and Accessory Compartments	3	1	3	1	3	1	3	1	1
55/57 Flight control surfaces (All)	3	1	3	1	-	-	-	-	1
Turbine Engine									
70 Standard Practices – Engines	3	1	-	-	3	1	-	-	1
70A Constructional arrangement and operation (Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals, Lubrication Systems).	3	1	-	-	3	1	-	-	1

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
70B Engine Performance	3	1	-	-	3	1	-	-	1
71 Powerplant	3	1	-	-	3	1	-	-	1
72 Engine Turbine/Turbo Prop/Ducted Fan/Unducted fan	3	1	-	-	3	1	-	-	1
73 Engine Fuel and Control	3	1	-	-	3	1	-	-	1
73A FADEC	3	1	-	-	3	1	-	-	3
74 Ignition	3	1	-	-	3	1	-	-	3
75 Air	3	1	-	-	3	1	-	-	1
76 Engine controls	3	1	-	-	3	1	-	-	1
77 Engine Indicating Systems	3	1	-	-	3	1	-	-	3
78 Exhaust	3	1	-	-	3	1	-	-	1
79 Oil	3	1	-	-	3	1	-	-	1
80 Starting	3	1	-	-	3	1	-	-	1
82 Water Injections	3	1	-	-	3	1	-	-	1
83 Accessory Gear Boxes	3	1	-	-	3	1	-	-	1
84 Propulsion Augmentation	3	1	-	-	3	1	-	-	1
Auxiliary Power Units (APUs):									
49 Auxiliary Power Units (APUs)	3	1	-	-	3	1	-	-	2
Piston Engine									
70 Standard Practices — Engines	-	-	3	1	-	-	3	1	1
70A Constructional arrangement and operation (Installation, Carburettors, Fuel injection systems, Induction, Exhaust and Cooling Systems, Supercharging/Turbocharging, Lubrication Systems).	-	-	3	1	-	-	3	1	1
70B Engine Performance	-	-	3	1	-	-	3	1	1
71 Powerplant	-	-	3	1	-	-	3	1	1
73 Engine Fuel and control	-	-	3	1	-	-	3	1	1
73A FADEC	-	-	3	1	-	-	3	1	3
74 Ignition	-	-	3	1	-	-	3	1	3
76 Engine Control	-	-	3	1	-	-	3	1	1
77 Engine Indication Systems	-	-	3	1	-	-	3	1	3

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	Aeroplanes turbine		Aeroplanes piston		Helicopters turbine		Helicopters piston		Avionics
	B1	C	B1	C	B1	C	B1	C	B2
79 Oil	-	-	3	1	-	-	3	1	1
80 Starting	-	-	3	1	-	-	3	1	1
81 Turbines	-	-	3	1	-	-	3	1	1
82 Water Injection	-	-	3	1	-	-	3	1	1
83 Accessory Gear boxes	-	-	3	1	-	-	3	1	1
84 Propulsion Augmentation	-	-	3	1	-	-	3	1	1
Propellers									
60A Standard Practices — Propeller	3	1	3	1	-	-	-	-	1
61 Propellers/Propulsion	3	1	3	1	-	-	-	-	1
61A Propeller Construction	3	1	3	1	-	-	-	-	-
61B Propeller Pitch Control	3	1	3	1	-	-	-	-	-
61C Propeller Synchronising	3	1	3	1	-	-	-	-	1
61D Propeller Electronic control	2	1	2	1	-	-	-	-	3
61E Propeller Ice Protection	3	1	3	1	-	-	-	-	-
61F Propeller Maintenance	3	1	3	1	-	-	-	-	1
Military-Specific Systems									
92 Radar	2	1	2	1	2	1	-	-	3
93 Surveillance	2	1	2	1	2	1	-	-	3
94 Weapon System	2	1	2	1	2	1	-	-	3
95 Crew Escape and Safety (partially covered by 25 for Helicopters)	3	1	3	1	3	1	3	1	2
96-40 Telemetry	2	1	2	1	2	1	-	-	3
97 Image Recording	2	1	2	1	2	1	-	-	2
99 Electronic Warfare	2	1	2	1	2	1	-	-	3

3.2 Practical element

(a) Objective:

The objective of practical training is to gain the required competence in performing safe maintenance, inspections and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for example troubleshooting, repairs, adjustments, replacements, rigging and functional checks. It includes the awareness of the use of all technical literature and documentation for the aircraft, the use of specialist/special tooling and test equipment for performing removal and replacement of components and modules unique to type, including any on-wing maintenance activity.

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

(b) Content:

At least 50% of the crossed items in the table below, which are relevant to the particular aircraft type, shall be completed as part of the practical training.

Tasks crossed represent subjects that are important for practical training purposes to ensure that the operation, function, installation and safety significance of key maintenance tasks is adequately addressed; particularly where these cannot be fully explained by theoretical training alone. Although the list details the minimum practical training subjects, other items may be added where applicable to the particular aircraft type.

Tasks to be completed shall be representative of the aircraft and systems both in complexity and in the technical input required to complete that task. While relatively simple tasks may be included, other more complex tasks shall also be incorporated and undertaken as appropriate to the aircraft type.

If it exists, the minimum list of practical tasks of the operational suitability data (OSD), established in accordance with EMAR 21, shall be part of the practical elements to be selected.

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.

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
Introduction module:											
05 Time limits/maintenance checks	X/X	-	-	-	-	-	-	-	-	-	-
06 Dimensions/Areas (MTOM, etc.)	X/X	-	-	-	-	-	-	-	-	-	-
07 Lifting and Shoring	X/X	-	-	-	-	-	-	-	-	-	-
08 Levelling and weighing	X/X	-	X	-	-	-	-	X	-	-	-
09 Towing and taxiing	X/X	-	X	-	-	-	-	X	-	-	-
10 Parking/mooring, Storing and Return to Service	X/X	-	X	-	-	-	-	X	-	-	-
11 Placards and Markings	X/X	-	-	-	-	-	-	-	-	-	-
12 Servicing	X/X	-	X	-	-	-	-	X	-	-	-
14 Product loading and off loading	X/X	-	X	-	-	-	-	X	-	-	-
20 Standard practices including armament safety — only type particular	X/X	-	X	-	-	-	-	X	-	-	-
Helicopters:											
18 Vibration and Noise Analysis (Blade tracking)	X/-	-	-	-	-	X	-	-	-	-	-
25 Emergency Flotation Equipment	X/X	X	X	X	X	X	X	X	-	-	-
53 Airframe Structure (Helicopter) Note: covered under Airframe structures											

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
60 Standard Practices Rotor — only type specific	X/X	-	X	-	-	-	-	X	-	-	-
62 Rotors	X/-	-	X	X	-	X	-	-	-	-	-
62A Rotors — Monitoring and indicating	X/X	X	X	X	X	X	-	-	X	-	X
63 Rotor Drives	X/-	X	-	-	-	X	-	-	-	-	-
63A Rotor Drives — Monitoring and indicating	X/X	X	-	X	X	X	-	-	X	-	X
64 Tail Rotor	X/-	-	X	-	-	X	-	-	-	-	-
64A Tail rotor - Monitoring and indicating	X/X	X	-	X	X	X	-	-	X	-	X
65 Tail Rotor Drive	X/-	X	-	-	-	X	-	-	-	-	-
65A Tail Rotor Drive — Monitoring and indicating	X/X	X	-	X	X	X	-	-	X	-	X
66 Folding Blades/Pylon	X/-	X	X	-	-	X	-	-	-	-	-
67 Rotors Flight Control	X/-	X	X	-	X	X	-	-	-	-	-
Airframe structures:											
51 Standard Practices and Structures (damage classification, assessment and repair)											
52 Doors	X/X	X	X	-	-	-	-	X	-	-	-
53 Fuselage	X/-	-	-	-	-	X	-	-	-	-	-
54 Nacelles/Pylons	X/-	-	-	-	-	-	-	-	-	-	-
55 Stabilisers	X/-	-	-	-	-	-	-	-	-	-	-
56 Windows and canopies	X/-	-	-	-	-	X	-	-	-	-	-
57 Wings	X/-	-	-	-	-	-	-	-	-	-	-
Airframe systems:											
21 Air Conditioning	X/X	X	X	-	X	X	X	X	-	X	X
21A Air Supply	X/X	X	-	-	-	-	X	-	-	-	-
21B Pressurisation	X/X	X	-	-	X	X	X	-	-	X	X
21C Safety and warning Devices	X/X	-	X	-	-	-	-	X	-	-	-
22 Autoflight	X/X	-	-	-	X	-	X	X	X	X	X
23 Communications	X/X	-	X	-	X	-	X	X	X	X	X
24 Electrical Power	X/X	X	X	X	X	X	X	X	X	X	X
25 Equipment and Furnishings	X/X	X	X	X	-	-	X	X	X	-	-
25A Electronic Equipment including emergency equipment	X/X	X	X	X	-	-	X	X	X	-	-

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
26 Fire Protection	X/X	X	X	X	X	X	X	X	X	X	X
27 Flight Controls	X/X	X	X	X	X	X	X	-	-	-	-
27A Sys. Operation: Electrical/Fly-by-Wire	X/X	X	X	X	X	-	X	-	X	-	X
28 Fuel Systems	X/X	X	X	X	X	X	X	X	-	X	-
28A Fuel Systems — Monitoring and indicating	X/X	X	-	-	-	-	X	-	X	-	X
29 Hydraulic Power	X/X	X	X	X	X	X	X	X	-	X	-
29A Hydraulic Power — Monitoring and indicating	X/X	X	-	X	X	X	X	-	X	X	X
30 Ice and Rain Protection	X/X	X	X	-	X	X	X	X	-	X	X
31 Indicating/Recording Systems	X/X	X	X	X	X	X	X	X	X	X	X
31A Instrument Systems	X/X	X	X	X	X	X	X	X	X	X	X
32 Landing Gear	X/X	X	X	X	X	X	X	X	X	X	-
32A Landing Gear — Monitoring and indicating	X/X	X	-	X	X	X	X	-	X	X	X
33 Lights	X/X	X	X	-	X	-	X	X	X	X	-
34 Navigation	X/X	-	X	-	X	-	X	X	X	X	X
35 Oxygen	X/-	X	X	X	-	-	X	X	-	-	-
36 Pneumatic	X/-	X	-	X	X	X	X	-	X	X	X
36A Pneumatic — Monitoring and indicating	X/X	X	X	X	X	X	X	X	X	X	X
37 Vacuum	X/-	X	-	X	X	X	-	-	-	-	-
38 Water/Waste	X/-	X	X	-	-	-	X	X	-	-	-
40 Operational attack functions	X/X	-	-	-	-	-	X	X	X	X	X
41 Water Ballast	X/-	-	-	-	-	-	-	-	-	-	-
42 Integrated modular avionics	X/X	-	-	-	-	-	X	X	X	X	X
42A Cross-technical attack functions	X/X	X	-	-	-	-	X	X	X	X	X
44 Cabin Systems	X/X	-	-	-	-	-	X	X	X	X	X
45 On-Board Maintenance System (or covered in 31)	X/X	X	X	X	X	X	X	X	X	X	X
46 Information Systems	X/X	-	-	-	-	-	X	-	X	X	X
47 Nitrogen generation system	X/X	X	X	X	X	X	X	-	-	-	X
48 In-Flight refueling tanker	X/X	X	X	X	X	X	X	X	-	X	-
48A In-Flight refueling tanker – Monitoring and Indicating	X/X	X	X	X	X	X	X	X	X	X	X

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
50 Cargo and Accessory Compartments	X/X	-	X	-	-	-	-	-	-	-	-
55/57 Flight control surfaces	X/-	-	-	-	-	X	-	-	-	-	-
Turbine/Piston Engine:											
Turbine Engines:											
70 Standard Practices — Engines — only type particular	-	-	X	-	-	-	-	X	-	-	-
70A Constructional arrangement and operation (Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals, Lubrication Systems	X/X	-	-	-	-	-	-	-	-	-	-
70B Engine Performance	-	-	-	-	-	X	-	-	-	-	-
71 Power Plant	X/-	X	X	-	-	-	-	X	-	-	-
72 Engine Turbine/Turbo Prop/Ducted Fan/ Unducted fan	X/-	-	-	-	-	-	-	-	-	-	-
73 Engine Fuel and Control	X/X	X	-	-	-	-	-	-	-	-	-
73A FADEC Systems	X/X	X	-	X	X	X	X	-	X	X	X
74 Ignition	X/X	X	-	-	-	-	X	-	-	-	-
75 Air	X/-	-	-	X	-	X	-	-	-	-	-
76 Engine Controls	X/-	X	-	-	-	X	-	-	-	-	-
77 Engine Indicating	X/X	X	-	-	X	X	X	-	-	X	X
78 Exhaust	X/-	X	-	-	X	-	-	-	-	-	-
79 Oil	X/-	-	X	X	-	-	-	-	-	-	-
80 Starting	X/-	X	-	-	X	X	-	-	-	-	-
82 Water Injection	X/-	X	-	-	-	-	-	-	-	-	-
83 Accessory Gearboxes	X/-	-	X	-	-	-	-	-	-	-	-
84 Propulsion Augmentation	X/-	X	-	-	-	-	-	-	-	-	-
Auxiliary Power Units (APUs):											
49 Auxiliary Power Units (APUs)	X/-	X	X	-	-	X	-	-	-	-	-
Piston Engines:											
70 Standard Practices — Engines — only type particular	-	-	X	-	-	-	-	X	-	-	-
70A Constructional arrangement and operation (Installation, Carburettors, Fuel injection systems, Induction, Exhaust and Cooling Systems, Supercharging /	X/X	-	-	-	-	-	-	-	-	-	-

EMAR 66 – MILITARY AIRCRAFT MAINTENANCE LICENSING

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
Turbocharging, Lubrication Systems											
70B Engine Performance	-	-	-	-	-	X	-	-	-	-	-
71 Power Plant	X/-	X	X	-	-	-	-	X	-	-	-
73 Engine Fuel and Control	X/X	X	-	-	-	-	-	-	-	-	-
73A FADEC Systems	X/X	X	-	X	X	X	X	X	X	X	X
74 Ignition	X/X	X	-	-	-	-	X	-	-	-	-
76 Engine Controls	X/-	X	-	-	-	X	-	-	-	-	-
77 Engine Indicating	X/X	X	-	-	X	X	X	-	-	X	X
78 Exhaust	X/-	X	-	-	X	X	-	-	-	-	-
79 Oil	X/-	-	X	X	-	-	-	-	-	-	-
80 Starting	X/-	X	-	-	X	X	-	-	-	-	-
81 Turbines	X/-	X	X	X	-	X	-	-	-	-	-
82 Water Injection	X/-	X	-	-	-	-	-	-	-	-	-
83 Accessory Gearboxes	X/-	-	X	X	-	-	-	-	-	-	-
84 Propulsion Augmentation	X/-	X	-	-	-	-	-	-	-	-	-
Propellers:											
60A Standard Practices — Propeller	-	-	-	X	-	-	-	-	-	-	-
61 Propellers/Propulsion	X/X	X	X	-	X	X	-	-	-	-	-
61A Propeller Construction	X/X	-	X	-	-	-	-	-	-	-	-
61B Propeller Pitch Control	X/-	X	-	X	X	X	-	-	-	-	-
61C Propeller Synchronising	X/-	X	-	-	-	X	-	-	-	X	-
61D Propeller Electronic control	X/X	X	X	X	X	X	X	X	X	X	X
61E Propeller Ice Protection	X/-	X	-	X	X	X	-	-	-	-	-
61F Propeller Maintenance	X/X	X	X	X	X	X	X	X	X	X	X
Military-Specific Systems											
92 Radar	X/X	X	X	X	X	-	X	X	X	X	X
93 Surveillance	X/X	X	X	X	X	-	X	X	X	X	X
94 Weapon system	X/X	X	X	X	X	-	X	X	X	X	X
95 Crew escape and Safety	X/X	X	X	X	X	X	X	X	X	X	-
96-40 Telemetry	X/X	X	X	X	X	-	X	X	X	X	X
97 Image recording	X/X	X	X	X	X	-	X	X	X	X	X
99 Electronic Warfare	X/X	X	X	X	X	-	X	X	X	X	X

4. Military aircraft type training examination and assessment standard

4.1 Theoretical element examination standard

After the theoretical portion of the military aircraft type training has been completed, a written examination shall be performed, which shall comply with the following:

(a) Format of the examination is of the multi-choice type. Each multi-choice question shall have 3 alternative answers of which only one shall be the correct answer. The total time is based on the total number of questions and the time for answering is based upon a nominal average of 90 seconds per question.

(b) The incorrect alternatives shall seem equally plausible to anyone ignorant of the subject. All the alternatives shall be clearly related to the question and of similar vocabulary, grammatical construction and length.

(c) In numerical questions, the incorrect answers shall correspond to procedural errors such as the use of incorrect sense (+ versus -) or incorrect measurement units. They shall not be mere random numbers.

(d) The level of examination for each chapter (*) shall be the one defined in point 2 "Military Aircraft Type Training levels". However, the use of a limited number of questions at a lower level is acceptable.

(e) The examination shall be of the closed book type. No reference material is permitted. An exception will be made for the case of examining a B1 or B2 candidate's ability to interpret technical documents.

(f) The number of questions shall be at least 1 question per hour of training. The number of questions for each chapter and level shall be proportionate to:

- the effective training hours spent teaching at that chapter and level; or
- in case of student-centred² methods, the anticipated average time to complete the training; and
- the learning objectives as given by the training needs analysis.

The NMAA will assess the number and the level of the questions when approving the course.

(g) The minimum examination pass mark is 75 %. When the Military Type Training examination is split in several examinations, each examination shall be passed with at least a 75 % mark. In order to be possible to achieve exactly a 75 % pass mark, the number of questions in the examination shall be a multiple of 4.

(h) Penalty marking (negative points for failed questions) is not to be used.

(i) End of module phase examinations cannot be used as part of the final examination unless they contain the correct number and level of questions required.

(j) Whilst it is accepted that the subject matter of the questions may be the same, the questions used as part of the MBT learning programme shall not be used in course or phase examinations.

(*) For the purpose of this point 4, a "chapter" means each one of the rows preceded by a number in the table contained in point 3.1(e).

4.2 Practical element assessment standard

After the practical element of the Military Aircraft Type Training has been completed, an assessment must be performed, which must comply with the following:

² 'Student-centred' means that the student is responsible for the learning progress

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- (a) The assessment shall be performed by designated assessor(s) appropriately qualified.
- (b) The assessment shall evaluate the knowledge and skills of the trainee.

5. Type evaluation standard for Group 2 and Group 3 aircraft

NOT APPLICABLE.

6. On-the-Job-Training (OJT)

6.1 General

The OJT is the training that the applicant is given on a particular aircraft type in a real workplace, having the possibility to learn maintenance best practices and correct release-to-service procedures. The OJT shall comply with the following requirements:

- (a) The list of the OJT tasks and programme shall be accepted by the NMAA which has issued the MAML before starting the OJT training.
- (b) The OJT shall be conducted at one or more maintenance organisations appropriately EMAR 145 approved for the maintenance of that aircraft type. One of those organisations shall control the OJT.
- (c) The applicant shall have a category B licence before undergoing the OJT or have finished the theoretical type training as regards the category of aircraft he or she is trained for.
- (d) The applicant shall start and complete the OJT within 3 years preceding the application for the first type rating endorsement. At least 50 % of the OJT tasks shall take place after the related aircraft theoretical type training has been completed.
- (e) The applicant shall undergo the OJT under the mentorship of a qualified mentor or mentors, on a one-to-one supervision basis, during which the mentor(s) verify the technical knowledge, the skills, and responsibilities of a typical certifying staff. During the OJT, the mentor(s) transmit also knowledge and experience to the applicant, providing the necessary advice, support, and guidance.
- (f) Each task shall be signed off by the applicant and refer to an actual job card/work sheet, etc. The mentor(s) shall verify and countersign off the tasks performed during the OJT, because they shall assume the responsibility for the tasks at support staff or certifying staff level, as applicable, depending on the release-to-service procedure.
- (g) At the satisfactory completion of the OJT programme, the mentor(s) shall issue a recommendation for the final assessment of the applicant to be conducted by designated assessor(s).

6.2 OJT content and OJT logbook

The OJT shall include a series of activities and tasks representative of the military aircraft type rating, systems, and licence category (including extensions if any) applied for and may cover more than one licence category.

The OJT shall be documented in an OJT logbook reporting the following:

- (a) name of the applicant;
- (b) date of birth of the applicant;
- (c) the approved maintenance organisation(s) where the OJT was carried out;

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- (d) aircraft rating and licence categories applied for;
- (e) list of tasks, including:
 - (i) task description;
 - (ii) reference to job card/work order/aircraft tech log, etc.;
 - (iii) location of task completion;
 - (iv) date of task completion;
 - (v) aircraft registration(s).
- (f) names of the mentor(s) (including licence number, if applicable);
- (g) a signed recommendation of the mentor(s) for the successive final assessment of the applicant.

6.3 Final assessment of the applicant

The final assessment of the applicant may only be performed once the OJT logbook has been completed as required and the mentor(s) have signed the related recommendation.

The designated assessor(s) conducting the final assessment shall notify the date of the assessment to the NMAA well in advance to allow a possible participation of the NMAA.

The objective of the final assessment is to verify that the applicant has sufficient technical knowledge as well as the appropriate skills and attitude and that he or she is competent to work independently as type-rated certifying staff on a particular aircraft type.

The final assessment shall have a duration adapted to the OJT content.

- (a) The assessment shall sample:
 - (1) the general technical knowledge required for the particular licence category;
 - (2) the aircraft-type-specific knowledge and skills for the particular licence category;
 - (3) the understanding of the licence privileges relevant to the aircraft and to the licence category;
 - (4) the appropriate behaviour and safety attitude of the applicant in relation to the maintenance environment.
- (b) The assessment shall be recorded in a report containing the following information:
 - (1) identification data of the applicant;
 - (2) identification data of the assessor(s);
 - (3) date and time frame of the assessment;
 - (4) content of the assessment;
 - (5) result of the assessment: Passed or Failed.
 - (6) signature of the assessor(s), the candidate and, if applicable, the independent observer(s).
- (c) A failed assessment may be retaken after 3 months or, if additional training has been received and a new recommendation by the mentor(s) has been made, earlier than 3 months if agreed by the assessor(s). After three failed attempts, the complete OJT shall be repeated.

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6.4 Requirements for mentors and assessors

Mentors and assessors are maintenance staff with the following qualifications:

(i) Mentors:

- hold a valid MAML issued in accordance with EMAR 66;
- have been holding, for at least 1 year, a MAML in the same category, when compared to the one for which the OJT is being mentored, that is endorsed with a military aircraft type rating appropriate to exercise the privileges on the related aircraft;
- have the necessary release or sign-off privileges in the maintenance organisation where the OJT is performed;
- have experience in training other people (such as being apprenticeship instructors, instructors in accordance with EMAR 147, having received train-the-trainer courses or having any other comparable national qualification, or having a training to do so that is acceptable to the NMAA).

(ii) Assessor(s) of the final assessment:

- hold a valid MAML issued in accordance with EMAR 66;
- have been holding, for at least 3 years, a MAML in the same category, when compared to the one for which the OJT is being assessed, endorsed with the same or similar military aircraft type rating;
- have experience and/or have received training in assessing others (such as being apprenticeship instructors, examiners in accordance with EMAR 147, having received train-the-trainer courses, or having any other comparable national qualification, or having a training to do so that is acceptable to the NMAA);
- shall not have been involved as a mentor of the applicant in the OJT; when the assessor has taken part in the OJT performance, then an independent observer shall be present during the OJT assessment.

6.5 OJT documentation and records

The satisfactory accomplishment of the OJT shall be attested to the applicant with the final assessment report and the OJT logbook.

The OJT documentation shall be provided to the NMAA to support the application for the issue or change of the licence as laid down in [Section B, Subpart B](#), of EMAR 66.

Records of the OJT documentation shall be kept by the maintenance organisation where the OJT is conducted, in accordance with the procedures agreed with the NMAA of the maintenance organisation.

Appendix IV - Experience and basic knowledge modules or partial modules required for extending a Military Aircraft Maintenance Licence under EMAR 66

A. Experience requirements

Table A below shows the experience requirements, in months, for adding a new category or subcategory to a MAML granted in accordance with EMAR 66.

The experience shall be practical maintenance experience on operating aircraft in the subcategory relevant to the application.

The experience requirements can be reduced by 50% if the applicant has completed an approved EMAR 147 basic training course relevant to a particular subcategory. However, this reduction in experience requirements is not applicable to a category A licence.

TABLE A

To From	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
A1	—	6	6	6	24	6	24	12	24
A2	6	—	6	6	24	6	24	12	24
A3	6	6	—	6	24	12	24	6	24
A4	6	6	6	—	24	12	24	6	24
B1.1	-	6	6	6	—	6	6	6	12
B1.2	6	-	6	6	24	—	24	6	24
B1.3	6	6	-	6	6	6	—	6	12
B1.4	6	6	6	-	24	6	24	—	24
B2	6	6	6	6	12	12	12	12	—

B. Basic knowledge modules or partial modules required

The purpose of this table is to outline the examinations required to add a new basic category/subcategory to a MAML granted in accordance with EMAR 66.

The syllabus prepared in accordance with [Appendix I](#) require different levels of knowledge for different licence categories within a module; therefore, there are additional examinations applicable to certain modules for licence holders wishing to extend a MAML granted in accordance with EMAR 66 to include another category/subcategory and an analysis of the module shall be conducted to determine the subjects missing or passed at a lower level.

Table B

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From To	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2
A1	None	16.	12.	12, 16.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.
A2	11, 15.	None	12, 15.	12.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.
A3	11, 17.	11, 16, 17.	None	16.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.
A4	11, 15, 17.	11, 17.	15.	None	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.
B1.1	None	16.	12.	12, 16.	None	16.	12.	12, 16.	4, 5, 13, 14.
B1.2	11, 15.	None	12, 15.	12.	11, 15.	None	12, 15.	12.	4, 5, 13, 14.
B1.3	11, 17.	11, 16, 17.	None	16.	11, 17.	11, 16, 17.	None	16.	4, 5, 13, 14.
B1.4	11, 15, 17.	11, 17.	15.	None	11, 15, 17.	11, 17.	15.	None	4, 5, 13, 14.
B2	6, 7, 11, 15, 17.	6, 7, 11, 16, 17.	6, 7, 12, 15.	6, 7, 12, 16.	6, 7, 11, 15, 17.	6, 7, 11, 16, 17.	6, 7, 12, 15.	6, 7, 12, 16.	None

Appendix V - Application Form – EMAR Form 19

EMAR Form 19 is contained in the EMAR Forms document.

Appendix VI - Military Aircraft Maintenance Licence (MAML) – EMAR Form 26

EMAR Form 26 is contained in the EMAR Forms document.

Appendix VII - Basic knowledge requirements for category L aircraft maintenance licence

NOT APPLICABLE.

Appendix VIII - Basic examination standard for category L aircraft maintenance licence

NOT APPLICABLE.

Appendix IX - Assessment method for the Multimedia-Based Training (MBT)

1. The purpose of this Appendix is to establish the requirements for the assessment and approval by a NMAA of any course that includes MBT in accordance with [EMAR 66.B.135](#).

This Appendix may be used for the assessment of other training courses if NMAA decides that the assessment method laid down in this Appendix is appropriate for such other courses.

The assessment shall be conducted by the NMAA against all the criteria laid down in Table (A), grouped in four categories from (a) to (d). The NMAA shall clearly identify in the table the MBT product being assessed and its production and update versions.

2. The NMAA carrying out the assessment shall put itself in the position of the student or the end user and shall rate each criterion listed in Table (A) individually on a rating scale from 1 to 5, as follows:
 - 1: Not acceptable. Does not meet the required criteria.
 - 2: Partially acceptable, but improvement is needed to meet the required criteria.
 - 3: Acceptable. Meets the required criteria.
 - 4: Good. Meets the required criteria with enhancements made.
 - 5: Excellent. Exceeds the required criteria.
3. If one or more of the criteria is rated below 3, an alternative learning process shall be requested by the NMAA in order to enhance the suitability of the product to an acceptable level.
4. Once the NMAA has rated each of the individual criteria listed in Table (A) , the following combined rating scale shall be used by the NMAA to determine the overall suitability level for each MBT learning resource:
 - 100–80: Excellent learning resource. It offers different functionalities and meets the required suitability criteria.
 - 79–60: The learning resource meets the required suitability criteria.
 - 59–40: The learning resource does not allow for a sufficiently worthy educational use. It can be used for 'informal' training only.
 - 39–20: The learning resource is below the average. It does not meet several required suitability criteria.

Before approving the product, the NMAA shall check that the final score of the MBT is equal to or above 60, and that there is no single criterion that is rated below 3.

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Table (A): Assessment for the multimedia-based training (MBT)

Assessment table for the multimedia-based training (MBT)		
Product identification:		
Name:	Version:	
		SCORE (1–5)
Category (a) ‘academic quality’		
Information reliability	1. The information is reliable.	
Information relevance	2. The information is relevant.	
Category (b) ‘pedagogical quality’		
Pedagogical formulation/ construction	3. The quality of the resource simplification is adequate.	
	4. The educational resource presents an appropriate number of overviews and summaries.	
	5. The resource is clearly structured (summaries, plans)	
	6. The structure promotes its use in the pedagogical context.	
Pedagogical strategies	7. The learning objectives are stated.	
	8. The resource includes stimuli to promote learning.	
	9. The resource creates interaction between student and instructor.	
	10. The active engagement of the student is fostered.	
	11. Student-centred learning is present.	
	12. Problem-solving tasks encourage learning.	
	13. The resource enables communication between students.	
	14. The student is able to see their learning progress.	
Student assessment methods	15. The resource provides a self-assessment procedure.	
Category (c) ‘didactic quality’		
Learning activities	16. The content refers to real-life situations that the student could possibly face in an actual maintenance environment.	
Learning content	17. The content is adequate to meet the learning objectives.	
Category (d) ‘technical quality’		
Design	18. The content and organisation of the learning resource includes the appropriate use of colours, interactivity,	

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	graphic quality, animations, and illustrations.	
Browsing	19. Navigation methods are clear, consistent, and intuitive.	
Technological aspects	20. Multimedia techniques promote the transfer of information.	
Final score		

Notes:

The following shall be taken into account by the NMAA when assessing the MBT against the individual criteria listed in Table (A):

Categories:

(a) Academic quality

The information presented in the multimedia resource shall have two characteristics:

- i. Reliability: the information is reliable, current, and relatively free of errors. The information complies with the current regulatory requirements.
- ii. Relevance: the information is relevant to the learning objectives defined for the course. It supports the student in achieving the learning objectives.

(b) Pedagogical quality

The MBT emphasises the activities which promote the development of the required knowledge and skills.

The main criteria for each product are related to three aspects:

- i. Pedagogical formulation/construction: it is characterised by the quality of simplification, the presence of summaries as well as the use of diagrams, figures, animations, and illustrations. It evaluates whether the structure of the learning resource promotes its use in a pedagogical context. This refers to the ease of orientation (summary, lesson plan), presence of appropriate interactions, usability (back, forward, scroll boxes, etc.), and communication resources (questions and answers, FAQs, forum, etc.)
- ii. Pedagogical strategies: teaching and learning styles should be based on active teaching approaches to build meaningful situations related to learning objectives and to learner motivation.
- iii. Student assessment methods: methods are implemented to measure the achievement of learning objectives.

(c) Didactic quality

- i. Learning activities: the content refers to real-life situations the student could possibly face in an actual maintenance environment.
- ii. Learning content: the content is adequate to meet the learning objectives.

(d) Technical quality

This section assesses the design, browsing and technological aspects of the learning resources:

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- i. Design: the content and organisation of the learning resource shall promote the appropriate use of colours, interactivity, graphic quality for selected images, animations, and illustrations.
- ii. Browsing: while navigating, the student should be able to find a plan, an index, or a detailed table of contents. The suggested choices or guidelines shall be clear and the groupings within the menus shall be consistent.
- iii. Technological aspects: multimedia techniques aim to combine and exploit the capacities of any new technology in education to enhance the transfer of knowledge. Therefore, the system shall favour the use of animations, simulations, or any other interactive elements.