European Union Aviation Safety Agency

Opinion No 07/2022

Review of Part-66
and
New training methods and new teaching technologies

RELATED NPA/CRD: 2020-12 — RMT.0255 (MDM.059)
RELATED NPA/CRD: 2014-22 — RMT.0281 (MDM.082)

EXECUTIVE SUMMARY

The main objectives of this Opinion are the following:

(a) facilitate the type rating endorsement of aircraft for which no Part-147 type training is available, maintaining the current level for safety and a level playing field;

(b) update the basic knowledge training syllabus in Part-66 since it contains some obsolete references;

(c) enhance the efficiency of the 'on-the-job training' (OJT) required for the first type rating endorsement in the maintenance licence category; and

(d) enhance the efficiency of the maintenance personnel training system with new training methods and new teaching technologies.

The Opinion also brings some necessary improvements and corrections that emerged with the implementation of the regulation.

The proposed amendments to Part-66 and Part-147 are expected to improve the efficiency of the maintenance personnel licencing and training system.

Action area:	Competence of personnel
Related rules:	Commission Regulation (EU) No 1321/2014 (Annexes III (Part-66) and IV (Part-147))
Affected stakeholders:	Competent authorities issuing maintenance licences; Part-147 maintenance training organisations; Part-145 and Part-CAO maintenance organisations; Part-66 aircraft maintenance licence applicants and holders
Driver:	Efficiency/proportionality **Rulemaking group:** Yes
Impact assessment:	Yes

	Start Terms of Reference	**Public consultation NPA**	**Proposal to the Commission** Opinion No 07/2022	**Adoption by the Commission** Implementing act	**Decision** Certification Specifications, Acceptable Means of Compliance, Guidance Material
RMT.0255	**14.8.2019**	**1.12.2020**	**5.9.2022**	**2023/Q3**	**2023/Q3**
RMT.0281	**19.11.2012**	**9.12.2014**			

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1. About this Opinion

1.1. How this Opinion was developed

The European Union Aviation Safety Agency (EASA) developed this Opinion in line with Regulation (EU) 2018/1139[1] ('Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking task (RMT).0255 (Review of Part-66) is included in Volume II of the European Plan for Aviation Safety (EPAS) for 2022-2026[3]. The scope and timescales of the task were defined in the related ToR[4].

The draft text of this Opinion has been developed by EASA considering the input of Rulemaking Group (RMG) RMT.0255. All the interested parties were consulted[5] through NPA 2020-12 (RMT.0255)[6].

The 518 comments received to the NPA from all interested parties, including industry and national competent authorities (NCAs), have been reviewed and addressed by EASA.

Section 2.5 summarises the most relevant comments, and EASA's responses to them will be presented in Comment-Response Document (CRD) 2020-12 and be available together with the ED Decision introducing the related acceptable means of compliance (AMC) and guidance material (GM).

The Opinion also implements the output of RMT.0281 (MDM.082) 'New training methods and new teaching technologies' following the consultation of NPA 2014-22[7]. All interested parties were also consulted through a workshop held on 22 September 2014 in Cologne. Comment-Response Document (CRD) 2014-22 will be available together with the ED Decision issuing the related acceptable means of compliance (AMC) and guidance material (GM).

RMT.0281 was included in the EPAS version for 2019-2023[8], but it was de-prioritised in accordance with criteria described in Chapter 3 of that EPAS version. The scope and timescales of the task were defined in the related ToR[9].

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1 Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139).

2 EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 01-2022 of 2 May 2022 replacing Decision No 18-2015 of 15 December 2015 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (https://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-no-01-2022-rulemaking-procedure-repealing-mb).

3 https://www.easa.europa.eu/document-library/general-publications/european-plan-aviation-safety-2022-2026

4 https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0255-mdm059-0

5 In accordance with Article 115 of Regulation (EU) 2018/1139, and Articles 4(2) and 6 of the Rulemaking Procedure.

6 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-12

7 https://www.easa.europa.eu/document-library/rulemaking-subjects/new-training-methods-or-new-teaching-technologies-part-66part

8 https://www.easa.europa.eu/document-library/general-publications/european-plan-aviation-safety-2019-2023

9 https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0281-mdm082

In May 2022 EASA sought the advice of the Member States' Advisory Body (MAB) members, observers and alternates on the draft Opinion, and the comments received after this consultation were reviewed and duly considered when developing the final regulatory material.

1.2. The next steps

This Opinion contains the proposed amendments to Regulation (EU) No 1321/2014[10] and their potential impacts. It is submitted to the European Commission, which will decide whether to amend that Regulation, based on the subject Opinion.

The Decision with the related AMC and GM will be published by EASA when the related regulation (implementing act) is adopted by the European Commission.

[10] Commission Regulation (EU) No 1321/2014 of 26 November 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 (OJ L 362, 17.12.2014, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R1321&qid=1656923605542).

2. In summary — why and what

2.1. Why we need to amend Part-66 — issue/rationale

Issue 1: type rating endorsement in the licence of aircraft for which Part-147 type trainings are no longer available

For some aircraft, belonging to Group 1 aircraft (66.A.5), there are no type training courses available due to lack of interest (financial return) by Part-147 organisations to conduct the course. This is often the case for old and out-of-production aircraft models.

Issue 2: obsolescence of the basic knowledge syllabus

The content of the modules in Appendix I needs to be updated to reflect some current aviation standards. There are also margins for improvements as regards the structure of the modules, and the submodules deserve a more logical subdivision for a better harmonisation between the different licence (sub)categories.

Issue 3: difficulties in the accomplishment of the on-the-job training (OJT)

The 'dual' nature of the OJT requirement, laying between Part-66 and Part-145/-CAO, is the principal cause of duplication of efforts since, in many cases, different authorities are involved in the approval of the OJT content and the procedure for the endorsement of a type rating on a Part-66 licence. The OJT is an element necessary for the licence first type rating endorsement, thus it shall be approved by the authority competent for the licence, but it is carried out in an approved maintenance organisation (AMO) where the OJT procedures are approved by the authority competent for the organisation. When the two authorities are different, an existing OJT already approved for an AMO may be not considered valid by the licensing authority, creating duplication of administrative efforts and excessive complications for the licence holder.

A particular situation exists linked to AMOs located in third countries where the OJT is performed in an organisation where EASA is the competent authority but is not competent for the licence.

Issue 4: new training methods and new teaching technologies

The evolution of aircraft technologies has been accompanied by the development of new training methods and teaching technologies, but Annex III (Part-66) and Annex IV (Part-147) to Regulation (EU) No 1321/2014 do not reflect these developments, and the training tools, as described in the current rules, do not sufficiently address the efficiency of the training courses. In particular:

— The current 147.A.145(b) excludes the possibility for any distance learning for the purpose of basic knowledge and aircraft type training in Part-147 approved maintenance training organisations (AMTOs), as it states that the training may only be carried out at the locations identified in the approval certificate and/or at any location specified in the maintenance training organisation exposition (MTOE).

— The current 147.A.115 (a) and (d) allow the use of synthetic training devices when they are considered beneficial for the training, but there is a lack of definition of such devices and a lack of guidance on their integration and usage in approved maintenance training.

— The current Appendix III to Part-66, point 3.(f) states that 'Multimedia Based Training (MBT) methods may be used to satisfy the theoretical training element either in the classroom or in a

virtual controlled environment', without further guidance and definition of the MBT and of the 'virtual controlled environment'.

— The training tools as described in the current rules do not allow the use of interactive means and do not sufficiently address the efficiency of the training courses.

— There is a need to permit the blending of the different training methods with the objective of improving the effectiveness and the efficiency of the courses.

— The current regulation does not provide any option to adapt the duration of the training based either on the use of the new training methods and technologies or the blending of training methods.

— There is a lack of criteria for competent authorities on how to evaluate, validate and/or approve courses based on MBT methods.

2.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 1 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Section 2.1.

The specific objectives of this proposal are as follows:

Issue 1: type rating endorsement in the licence of aircraft for which Part-147 type trainings are no longer available

Enhance the efficiency of the licensing system for Group 1 aircraft, facilitating the type rating endorsement of aircraft models for which Part-147 type trainings are no longer available.

Issue 2: obsolescence of the basic knowledge syllabus

Modernise and improve the basic training syllabus of Part-66 and make it easier to update.

Issue 3: difficulties in the accomplishment of the on-the-job training (OJT)

Improve the OJT standard, redefining the OJT concept and structure to fulfil the intended objectives in a more flexible way.

Issue 4: new training methods and new teaching technologies

Enhance the efficiency of the training system proposing a regulatory material to ensure the legitimacy of the new training methods and teaching technologies in terms of location, facilities, training records and documentation/course notes, the use of maintenance simulation training devices (MSTDs) for practical training and assessment, duration of training courses, examinations and qualification and training of the instructors.

2.3. How we want to achieve it — overview of the proposed amendments

Issue 1: type rating endorsement in the licence of aircraft for which Part-147 type trainings are no longer available

Introduce a provision in the regulation (66.B.130 (c)) allowing the mutual recognition of a type training course directly approved by the competent authority that it is provided by an organisation not approved in accordance with Part-147.

In line with the same principle, allow the recognition of the examinations conducted by the competent authorities according to 66.A.200.

Amend the criteria for Group 1 (66.A.5) excluding lower complex aircraft from the group. The new criteria will impact only small piston engine aircraft that will be moved to Group 3 requiring a 'type evaluation' and a demonstration of practical experience, instead of an individual type rating.

Issue 2: obsolescence of the basic knowledge syllabus

Update the content of the modules of Appendix I and optimise the knowledge levels of the licence categories.

While major elements of the syllabus (title of paragraphs, subparagraphs, and knowledge levels) are retained at the level of the implementing rule, the intention is to move the descriptive content of the basic knowledge modules to AMC level.

Issue 3: Difficulties in the accomplishment of the on-the-job training (OJT)

Improve the OJT standard in Appendix III, by clarifying the scope of the OJT, the final assessment and the roles and qualifications of the persons involved in the process by giving the authority the possibility to participate in the final assessment of the applicant and by specifying the documentation required including the records.

The related Decision is intended to revise Appendix II to the AMC for a more flexible and effective selection of the maintenance tasks and give more importance to the responsibilities of the certifying staff.

Note: The proposal to include OJT in the AMOs' scope (Part-145 or CAO), allowing AMOs to issue a certificate of recognition (CoR), was lastly discarded by virtue of new and more in-depth considerations. The core business and main scope of a maintenance organisation is not to provide training; thus, assigning them the possibility to issue a CoR could lead to an inefficient implementation of the OJT that might affect the complete approval of the organisation.

Issue 4: new training methods and new teaching technologies:

Refer to Section 2.4 for the details of the amendments.

The Opinion also introduces some corrections and improvement of the rule as follows:

— clarification of the basic experience requirement for licence category 'C' (66.A.30);

— accreditation of the basic knowledge Modules 1 (Mathematics) and 2 (Physics) recognised by the NCA (66.A.25 and 66.A.30);

— new provision for alternative means of compliance (66.B.2);

— provision for the mutual recognition of the credit report (66.B.400);

— clarifications for the demonstration of compliance with the operational suitability data (OSD) when it exists (Appendix III, 1.);

— clarification for the training required in the case of differences training (Appendix III 1.): when it is between two aircraft type ratings in the same licence category, or it is between two licence categories in the same type rating;

— clarification and improvement of the 'type examination' standard which is renamed 'type evaluation' (Appendix III, 5.) being applicable for the type rating endorsement of aircraft of Groups 2 and 3, to avoid any confusion with the 'examination' of the type training that applies to aircraft in Group 1;

— introduction of new tables in Appendix IV specifying the additional experience and knowledge required to extend the licence categories;

— correction of some errors identified in the basic knowledge modules applicable to L licences (Appendix VII) including some improvements to the modules. The related Decision is intended to contain AMC with the descriptive content, in analogy with the current Appendix I to Part-66.

2.4. Details of the proposed amendments

2.4.1. Details of the proposed amendments to Annex III (Part-66)

Amended point	Rule amended	Reason for the amendment
1,2	66.A.5 'Aircraft groups'	Amending the definition of Group 1 to exclude from it certain non-CMPA piston-engine aircraft and to improve the text referring to turbine-engine aeroplanes
3	66.A.10 'Application', point (e)	Permitting the submission of applications for Part-66 licences by organisations approved in accordance with Part-CAO
4	66.A.20 'Privileges', point (a) 7	Condition for CMPA Category C to include non-CMPA Category C
5	66.A.25 'Basic knowledge requirements'	Reworded for a better understanding of the: (a) requirement applicable to the diverse licence categories; (b) examination standard; (c) time validity; (d) recognition of credits; (e) introduction of credits for Modules 1 and 2 for the scope of the recognition of a full Part-147 course; (f) requirement to extend the licence category.
6	66.A.30 'Basic experience requirements', last two paragraphs of point (a) 2b	Removed the condition for B1.2 and B3 to obtain an L2 licence. The knowledge and experience required to extend a licence (sub)category are now specified in Appendix IV.
7	66.A.30 'Basic experience requirements', points (a) 3, 4 and 5	Clarified conditions for Category C for CMPA and other than CMPA (with or without an academic path)
8	66.A.30 'Basic experience requirements', point (e)	Clarified condition for experience gained in civil maintenance environment, i.e. Part-145 and Part-CAO
9	66.A.40 'Continued validity of the aircraft maintenance licence', point (b)	Consideration for organisations approved in accordance with Part-CAO for submission of applications for Part-66 licences
10	66.A.45 'Endorsement with aircraft ratings', point (d)	Term 'type examination' substituted by 'type evaluation' to avoid confusion with the type (training) examination.
11	66.A.45 'Endorsement with aircraft ratings', point (h)(ii)(3)	Removed the condition for B1.2 and B3 to obtain an L2 licence. The knowledge and experience required to extend a licence (sub)category are now specified in Appendix IV.
12	New point 66.B.2 'Means of compliance'	Introduction of the alternative means of compliance (AltMoC) provision to establish compliance with Part-66

Amended point	Rule amended	Reason for the amendment
13	66.B.105 'Procedure for the issue of an aircraft maintenance licence via a maintenance organisation approved in accordance with Annex II (Part-145) or Annex Vd (Part-CAO)'	Consideration for organisations approved in accordance with Part-CAO for making recommendations to the competent authority regarding applications for Part-66 licences
14	66.B.110 'Procedure for the change of an aircraft maintenance licence to include an additional basic category or subcategory'	Removed the condition for B1.2 and B3 to obtain an L2 licence. The knowledge and experience required to extend a licence (sub)category are now specified in Appendix IV.
15	66.B.130 'Procedure for the direct approval of aircraft type training', point (c)	Introduction of the condition for mutual recognition of a type training approved for an organisation not approved in accordance with Part-147, i.e. CoR EASA Form 149b.
16	New point 66.B.135 'Procedure for the approval of multimedia-based training (MBT) courses'	Introduction of a new requirement to require competent authorities to develop a procedure for the approval of multimedia-based training (MBT) courses based on the new training methods and teaching technologies, conducted either in a physical and/or a virtual environment (RMT.0281).
17, 18	66.B.200 'Examination by the competent authority'	Introduction of the condition for mutual recognition of an examination conducted by a competent authority, i.e. CoR EASA Form 148b. The term 'type examinations' has been replaced by 'type evaluations'.
19	SUBPART E – EXAMINATION CREDITS	An incorrect reference is corrected.
20	66.B.400 'General'	Introduction of a provision for the recognition of a credit report issued by an authority of another Member State.
21	66.B.405 'Examination credit report'	Text improved.
22	Appendix I, point 2	Text improved and tables combined in point 2. Modularisation. Moved the descriptive content of the basic knowledge modules to AMC level. Major elements of the syllabus (titles of paragraphs, subparagraphs, and knowledge levels) are retained in the IR.
22	MODULE 1. MATHEMATICS	B1, B2 and B3 have been merged because they are identical.
22	MODULE 2. PHYSICS	A has been upgraded to match the B3 level; B2 and B2L have been upgraded to match the B1 level.
22	MODULE 3. ELECTRICAL FUNDAMENTALS	B1 and B2 and B2L have been merged because they are identical; For A, 3.6 has been added.
22	MODULE 4. ELECTRONICS FUNDAMENTALS	Knowledge levels for B3 have been upgraded to match the B1 levels
22	MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS	Merged levels for B1x. Levels adjusted. Deleted GPS.
22	MODULE 6. MATERIALS AND HARDWARE	Added: (c) Repair and inspection procedures. B1 and B3 have been merged.
22	MODULE 7. MAINTENANCE PRACTICES	M7A and M7B have been merged. B3 has been upgraded to B1. 7.14.3 'Additive manufacturing' has been added. 7.21 'Documentation & communication': this new chapter is inserted to show compliance with 66.A.20(b)4.

Amended point	Rule amended	Reason for the amendment
22	MODULE 8. BASIC AERODYNAMICS	B3 has been upgraded to match the level of Category A B1 and B2/B2L have been merged because they are identical. 8.4 High-speed airflow' has been added.
22	MODULE 9. HUMAN FACTORS	The title has been amended because there is no A/B version any longer. B1, B2 and B3 have been merged because they are identical. 9.9 'Safety management' has been added (ref. NPA 2013-19). 9.10 'The "Dirty Dozen" and risk mitigation' has been added.
22	MODULE 10. AVIATION LEGISLATION	B1, B2, B2L and B3 have been merged because they are identical. The following have been added: 10.4 'Independent certifying staff' 10.8 'Oversight principles in continuing airworthiness' 10.9 'Maintenance and certification beyond the current EU regulations (if not superseded by EU requirements)' 10.10 'Cybersecurity in aviation maintenance'
22	MODULE 11. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEM	Modules 11A/B/C have been merged. Improved subdivision of the subjects. Added ATA chapters.
22	MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	Added ATA chapters.
22	MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	Improved subdivision of the subjects. Added ATA chapters.
22	MODULE 14. PROPULSION	Engines propulsion subjects added. 14.3 'Propeller systems' has been added.
22	MODULE 15. GAS TURBINE ENGINE	15.15 'Alternate turbine constructions' replaces 'Power Augmentation Systems'.
22	MODULE 16. PISTON ENGINE	B3 knowledge levels have been amended to match B1 knowledge levels. 16.14 'Alternative piston engine constructions' has been added.
22	MODULE 17. PROPELLER	M17A and 17B have been merged. B3 knowledge levels have been amended to match B1 knowledge levels.
23	Appendix I 'Basic knowledge requirements (except for category L licence)', point 3	Introduction of a new point 3. into Appendix I proposing different but appropriate training methods to be determined for each course or part thereof with regard to the scope and objectives of each training phase, taking into consideration the benefits and the limits of the available training methods (RMT.0281).
24	Appendix II, point 1.4	The evaluations by means of essay questions are limited to Module 7 only. The other essay questions are removed from Modules 9 and 10 because they are considered not necessary. The examinations cannot be considered test of the language grammar.
25,26, 27	Appendix II, points 1.11/12 and 13	The incorrect term 'failed module' is replaced by 'failed examination'. The text is improved/expanded to specify the conditions for splitting large modules and the interval between examination attempts.

Amended point	Rule amended	Reason for the amendment
28	Appendix II, new point 1.14 is added	Questions of MBT cannot be used for the exams.
29	Appendix II, point 2. 'Number of questions per module'	The number of questions has been recalculated according to the amended modules of Appendix I.
30	Appendix III	Title changed into 'Aircraft type training and type evaluation standard – on-the-job training (OJT)'
31, 32	Appendix III, point 1. (a)(ii) and point 1. (b)(ii)	The text has been improved to clarify the obligation with the OSD elements, when existing.
33	Appendix III, point 1. (b)(iv)	Amendment to replace 'other training devices' with 'maintenance simulation training devices (MSTDs)' and 'maintenance training devices (MTDs)'. The definitions for MSTD and MTD respectively are given in Table 3 (RMT.0281).
34, 35	Appendix III, point 1. (c)(i) and point 1. (c)(iv).	Point 1. (c)(i): the text has been changed to clarify the concept of the differences training. Point 1. (c)(iv) has been added to clarify the validity period of the differences training.
36	Appendix III, point 3. 'Aircraft type training standard'	Introduction of new text proposing different but appropriate training methods to be determined for each course or part thereof with regard to the scope and objectives of each training phase, taking into consideration the benefits and the limits of the available training methods and allowing the use of MBT methods (RMT.0281).
37	Appendix III, point 3.1(a)	The term 'approved maintenance data' has been replaced by 'maintenance data'.
38	Appendix III, the fourth paragraph of point 3.1(d)	Amendment of point 3.1.(d) by replacing 'attendance' by 'physical and/or virtual classroom attendance' and 'hours of training' by 'hours of physical and/or virtual classroom training' in order to reflect the new training methods and tools (RMT.0281).
39	Appendix III, point 3.1(e)	Text has been introduced to clarify the obligation to include the OSD elements, when existing.
40	Appendix III, table of point 3.1(e), Chapter '27A Flight Control Surfaces (All)'	This chapter has been renamed '55/57 Flight control surfaces (All)' and moved after Chapter '50 Cargo and Accessory compartments' to remove the ambiguity with Chapter '27A Sys. Operation: Electrical/Fly-by-wire'.
41 and 45	Appendix III, tables of points 3.1(e) and 3.2(b)	New ATA chapter 47 'Nitrogen generation system' has been added.
42	Appendix III, point 3.1(f)	Point 3.1 (f) is deleted (RMT.0281).
43	Appendix III, point 3.2(b)	Text has been introduced to clarify the obligation to include the OSD elements, when existing.
44	Appendix III, table of point 3.2(b), Chapter '27A Flight Control Surfaces (All)'	This chapter has been renamed '55/57 Flight control surfaces'.
46	Appendix III, point 4.1(f)	Amendment of point 4.1(f) to further detail the principle of determination of the minimum number of questions to be used for each chapter in the case of training methods that cannot be expressed in hours of instruction (student-centred, self-paced methods) (RMT.0281).
47	Appendix III, point 4.1(j)	Addition of a new point 4.1(j) to prevent the questions used as part of the MBT learning programme from being used in course or phase examinations (RMT.0281).

Amended point	Rule amended	Reason for the amendment
48	Appendix III, point 5	'Type examination' changed to 'type evaluation' to avoid confusion with the type training examination. The standard for type evaluation for Group 2 and Group 3 aircraft has been improved.
49	Appendix III, point 6	The OJT standard has been improved and restructured as follows: 6.1 General 6.2 OJT Content and OJT logbook 6.3 Final assessment of the applicant 6.4 Requirements for mentors and assessors (specified roles and qualifications) 6.5 OJT documentation and records
50	Appendix IV	The title of the Appendix has been changed to include basic knowledge modules requirements. The table for the required experience has been expanded, to include L licences, and improved. The new table for the required basic knowledge modules or part modules has been introduced.
51	Appendix VI, Part XIII. of Form 26	Correction of the Form 26 template.
52	Appendix VII	The table for the basic knowledge modules applicable to L subcategories has been improved. The table has been merged with the Table of Contents. Correction and improvement of the syllabi content has been introduced. The applicability of the modules has been changed. The descriptive content of the basic knowledge modules has been moved to AMC level. Major elements of the syllabus (titles of paragraphs, subparagraphs, and knowledge levels) are retained in the regulation.
52	2L 'HUMAN FACTORS'	'2L.6 The ''Dirty Dozen'' and risk mitigation' has been added.
52	3L 'AVIATION LEGISLATION'	'3L.2 Continuing airworthiness regulations' and '3L.5 Licence privileges and how to exercise them properly (Part-66, Part-ML)' have been added.
52	4L 'WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC'	The title has been changed and the content has changed in: 4L.1 Airframe wooden/combination of metal tube and fabric 4L.2 Materials 4L.3 Identifying damages and defects 4L.4 Standard repair and maintenance procedures
52	5L 'COMPOSITE STRUCTURE'	The title has been changed and the content has changed in: 5L.1 Airframe fibre-reinforced plastic (FRP) 5L.2 Materials 5L.3 Identifying damages and defects 5L.4 Standard repair and maintenance procedures
52	6L 'METALLIC STRUCTURE'	The title has been changed and the content has changed in: 6L.1 Metallic airframe 6L.2 Materials 6L.3 Identifying damage and defects 6L.4 Standard repair and maintenance procedures

Amended point	Rule amended	Reason for the amendment
52	7L 'AIRFRAME — GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS'	The title has been changed and the content has changed in: 7L.1 Theory of flight — gliders and aeroplanes 7L.2 Airframe structure — aeroplanes and gliders 7L.3 Air conditioning (ATA 21) 7L.4 Electrical power, cables and connectors (ATA 24) 7L.5 Equipment and furnishing (ATA 25) 7L.6 Fire protection and other safety systems (ATA 26) 7L.7 Flight controls (ATA 27) 7L.8 Fuel system (ATA 28) 7L.9 Hydraulic power (ATA 29) 7L.10 Ice and rain protection (ATA 30) 7L.11 Landing gear (ATA 32) 7L.12 Lights (ATA 33) 7L.13 Oxygen (ATA 35) 7L.14 Pneumatic/vacuum (ATA 36) 7L.15 Water ballast (ATA 41) 7L.16 Fasteners 7L.17 Pipes, hoses and connectors 7L.18 Springs 7L.19 Bearings 7L.20 Transmissions 7L.21 Control cables 7L.22 Fits and clearances 7.L23 Aircraft weight and balance 7L.24 Workshop practices and tools 7L.25 Disassembly, inspection, repair and assembly techniques 7L.26 Abnormal events 7L.27 Maintenance procedures
52	8L 'POWER PLANT'	Columns for applicability to 'Piston', 'Turbine' and 'Electrical' propulsion have been added. The content changed in: 8L.1 General engine fundamentals 8L.2 Piston engine fundamentals and performance 8L.3 Piston engine construction 8L.4 Piston engine fuel system (non-electronic) 8L.5 Starting and ignition system 8L.6 Air intake, exhaust and cooling system 8L.7 Supercharging/turbocharging 8L.8 Lubrication systems of piston engines 8L.9 Engine indication systems 8L.10 Electric aircraft engines 8L.11 Turbine engine fundamentals and performance 8L.12 Inlet and compressor 8L.13 Combustion chamber, starting and ignition system 8L.14 Turbine section and exhaust 8L.15 Other turbine engine components and systems 8L.16 Turbine engine inspections and ground operation 8L.17 Propeller 8L.18 Full authority digital engine control (FADEC) 8L.19 Lubricants and fuels 8L.20 Engine and propeller installation 8L.21 Engine monitoring and ground operation 8L.22 Engine/propeller storage and preservation

Amended point	Rule amended	Reason for the amendment
52	9L 'BALLOONS — HOT-AIR BALLOONS'	The title has been changed and the content has changed in: 9L.1 Theory of flight — hot-air balloons 9L.2 General airframe of hot-air balloons 9L.3 Envelope 9L.4 Heater system/burner 9L.5 Basket and basket suspension (including alternative devices) 9L.6 Instruments 9L.7 Equipment 9L.8 Hot-air balloon handling and storage 9L.9 Disassembly, inspection, repair and assembly techniques
52	10L 'BALLOONS — GAS (FREE/TETHERED) BALLOONS'	The title has been changed and the content has changed in: 10L.1 Theory of flight — gas balloons 10L.2 General airframe of gas balloons 10L.3 Envelope 10L.4 Netting 10L.5 Valves, parachutes and other related systems 10L.6 Load ring 10L.7 Basket (including alternative devices) 10L.8 Ropes and lines 10L.9 Instruments 10L.10 Tethered gas balloon (TGB) systems 10L.11 Equipment 10L.12 Gas balloon handling and storage 10L.13 Disassembly, inspection, repair and assembly techniques
52	11L 'AIRSHIPS — HOT-AIR / GAS AIRSHIPS'	The content has changed in: 11L.1 Theory of flight and control of airships 11L.2 Airship airframe structure — general concepts 11L.3 Airship envelope 11L.4 Gondola 11L.5 Airship flight control (ATA 27/55) 11L.6 Electrical power (ATA 24) 11L.7 Lights (ATA 33) 11L.8 Ice and rain protection 11L.9 Fuel systems (ATA 28) 11L.10 Engine and propellers in airships 11L.11 Airship handling and storage 11L.12 Disassembly, inspection, repair and assembly techniques
52	12L 'RADIO COM / ELT / TRANSPONDER / INSTRUMENTS'	'12L.4 Avionics general test equipment' has been added.
53	Appendix VIII, point (a)	Added points (vi) and (vii) clarifying condition for attempts to exams.
54	Appendix VIII, point (b)	The number of questions has been recalculated according to the changes of the modules' content.

Amended point	Rule amended	Reason for the amendment
55	New Appendix IX 'Assessment method for the multimedia-based training (MBT)'	In order to provide criteria on how to perform the assessment and the approval of such MBT courses, the new Appendix IX to Part-66 is proposed in order to establish the principles for the assessment of any course that includes MBT, and to introduce the use of the Assessment table for multimedia-based training (MBT). The assessment table is intended to serve as an objective tool to support the competent authority in the approval process of training courses applying MBT methods. Although it is mainly intended for the competent authorities, the assessment table may also be used by training device manufacturers and software developers in order to produce training devices and course software at a standardised suitability level to ensure that the courses applying such training methods and tools will be approved by the competent authorities. Part-147 organisations may also benefit from this guidance when deciding which training devices or course software to procure (RMT.0281).

2.4.2. Details of the proposed amendments to Annex IV (Part-147)

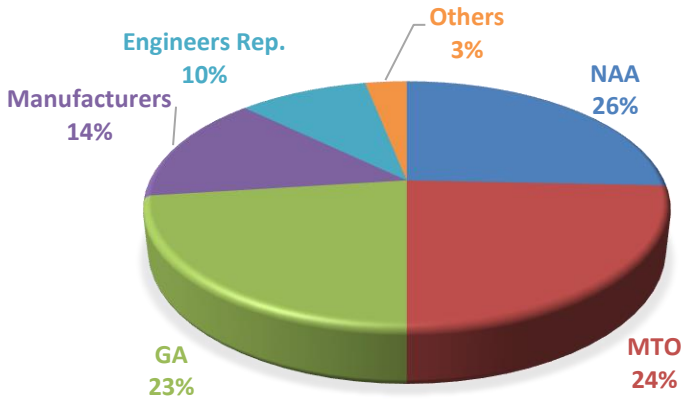
Amended point	Rule amended	Reason for the change
1, 2, 3, 4	147.A.100 'Facility requirements', points (b), (f) and (h), and new point (j)	147.A.100 (b), (f) and (h) are amended to adapt for the possibility of virtual training environments, for which the previous limitations on number of students per course are not relevant. Introduction of a new point (j) in 147.A.100 'Facilities requirements'. The purpose of this provision is to exempt the training organisation from complying with the requirements in points (a), (b), (c), (d) and (f) of 147.A.100 in the case of distance learning, as these requirements are intended for the instructions performed at the training facilities and do not apply to distance learning where the training organisation has no control over the environment in which the student is located during the training. The exemptions provided are only applicable to the training and shall not be applied to the examination and the assessment. Prior to commencing any distance learning course, the training organisation is required to brief the student and raise their awareness about the suitability of their learning location (RMT.0281).
5	147.A.105 'Personnel requirements', point (c)	Text improvement (RMT.0281).
6	147.A.115 'Instructional equipment', point (a)	Introduction in 147.A.115 'Instructional equipment' of a new point (a) with new requirements for the design of the training content in a virtual training environment, in addition to the existing provision for classroom presentation equipment. Moreover, 'synthetic training devices' is replaced by 'maintenance simulation training devices (MSTDs)' (RMT.0281).
7	147.A.115 'Instructional equipment', point (d)	Replacement of 'synthetic training devices' by 'MSTDs' (RMT.0281).

Amended point	Rule amended	Reason for the change
8	147.A.120 'Maintenance training material', new point (c)	Introduction of a new point (c) in 147.A.120 'Maintenance training material' in order to allow Part-147 organisations to provide the training material to the students in any medium. In the case of electronic media, the student must have the appropriate means of accessing such material during the course duration at any given time. This may be ensured by the Part-147 organisation either providing the means of accessing the material or providing to the student the minimum hardware and software specifications required for such access at any given time during the entire course duration (RMT.0281).
9	147.A.135 'Examinations', new point (d)	Introduction of a new point (d) in 147.A.135 'Examinations' in order to require the examination to be carried out in a controlled environment by the Part-147 organisation. Point (d) provides the definition of 'controlled environment' and stipulates the examination to be described in the MTOE. The examination shall only be conducted if the Part-147 organisation can establish and verify: the identity of the students, the proper conduct of the examination process, the integrity of the examination, and the security of the examination material (RMT.0281).
10	147.A.145 'Privileges of the maintenance training organisation', point (b)	Enhancement of point (b) in 147.A.145 'Privileges of the maintenance training organisation' by clarifying that the theoretical training, knowledge examinations, practical training and practical assessments may only be carried out at the locations identified in the approval certificate and/or at any location specified in the MTOE (RMT.0281).
11, 12	147.A.200, points (g) and (h)	Replacement of text in point (g) in 147.A.200 'The approved basic training course' with a provision that provides an exemption from point (f). This means that the number of hours as established in the modified Appendix I to Part-147 (Basic training course duration) may be amended by the Part-147 organisation provided that it can give proper justification of the proposed change, as described in the MTOE. This change applies only to the theoretical element of the basic training course in order to take benefit from the changes in training methods and teaching technologies. In practice, this means that a part of the training course conducted as distance learning (i.e. student-centred, self-paced methods) may result in reduction or extension of the time spent for learning depending on the pace or needs of each individual student. Hence, only the instructor-centred methods (classroom, virtual classroom, distance learning synchronous) can be expressed in hours while student-centred methods cannot. They are rather expressed as 'completion of the content', irrespective of how long the student has spent mastering the content. The existing point (g) is renumbered as point (h), without further changes (RMT.0281).
13	147.A.305 'Aircraft type examinations and task assessments'	The term 'type examinations' is substituted by 'type evaluation' to avoid confusion with the type (training) examination.

Amended point	Rule amended	Reason for the change
14, 15, 16, 17 and 18	Appendix III, points 1 and 2.	The text of the preambles has been improved. EASA Forms 148/149 have been split into 148a/149a, applicable to Part-147 organisations, and 148b/149b, applicable to authorities.

2.5. What are the stakeholders' views — outcome of the consultation

NPA 2020-12 received in total 518 comments:



From	Comments	Organisations
NCAs **National competent authorities**	133	AESA, LBA, ENAC CAA-NL, DGAC, UK CAA, CAA-NO, SWE, Austrocontrol, CAA-FIN, IAA, ICETRA, CAA-LUX
MTOs **Maintenance and training organisations**	126	KLM, British Airways, EAMTC, 147 NL-DE, Eurowing, AVIATEC, Savo, LRTT, Tampereen vocational college TREDU, SAS, Adria, AEROK.
GA **General Aviation community**	119	KNVVL Royal Netherlands Aviation Organisation, EAS, SAMA-ECOGAS, Luftsport Verband Bayern e.V., iAOPA, osk Hyvä Tapa Harrastaa, ESMA, EGU
Aircraft manufacturers	74	Airbus, Leonardo, Volocopter, Lilium, Flying Whales, Zeppelin
Representatives of engineers and individuals	50	AEI, EHA, Norsk Helikopter Ansattes Forbund, SFF, Svensk Flygteknikerförening.
Other organisations/associations	16	IATA, FNAM, IACO
Total	518	

In general, the vast majority of the comments support the draft amendments of the NPA and provide constructive proposals for the improvement of the individual amendments proposed by EASA. Considering that some of the comments provided by certain stakeholders pursued objectives that were contradictory with those proposed by other stakeholders, not all the comments received led to changes of the proposed text. However, EASA has taken all comments thoroughly into account and accepted all those considered to be contributing to the improvement of the proposed amendments.

A large number of comments, provided mainly by the general aviation community (GA) and by individuals, challenge the whole concept of the Part-66 (e.g. to have a separate Part-66L dedicated exclusively to the L licences or to redefine the privileges of the L1 and L2 in respect of the boundaries between not powered sailplanes, powered sailplanes (self-sustaining, self-launching and touring motor gliders (TMG) and ELA1 aeroplanes). These comments have been noted; however, EASA considers premature to rediscuss the concept of the 'light' L licences, since they have been introduced

only recently. The acquisition of more data and experience that will come from their practical implementation on field, will allow, at a later stage, a deeper and more appropriate evaluation by EASA.

The proposals for recognition of an OJT already approved for an AMO (upgrade AMC 66.B.115 (c) to the implementing rule level) or to move the OJT mechanism/principles to Part-145 under the Personnel Requirements (145.A.35) or under the organisation's qualification scheme, received strong opposition from most of the commenters. In the first case, many authorities want to keep the possibility to not recognise OJT already approved by another authority due to the different standards expected from the AMO for this process, especially for those carried out in non-EU countries. In the second case, the OJT is considered as a training requirement that shall remain under the remit of Part-66. No other practicable option came from the stakeholders that were invited to propose and justify other alternative solutions.

In light of the above, EASA decided to keep the OJT in Part-66 but improving the requirement both in the rule and in the future AMC & GM.

The proposal to introduce a practical skills assessment, applicable only for self-trained students without a vocational training or without being considered 'skilled workers', has been welcomed by major part of the commenters, although many consider it an additional regulatory burden for applicants for a Part-66 licence and a not yet mature concept for implementation in the rule.

However, a number of questions have been raised and are still to be discussed:

— how should the practical skills assessment be carried out in practice?

— what is the assessment standard that could be considered acceptable?

— what is the perimeter and the final goal of the competencies to be assessed?

The International Civil Aviation Organization (ICAO) is currently considering these questions, and it is reasonable to think that some essential guidelines will come from the concretisation of the ICAO CBTA[11] concept where the practical skills are assessed in the frame of a more general evaluation of the student's competencies[12].

ICAO CBTA applies generally across all aviation licence disciplines (maintenance personnel, traffic controllers and pilots), with special emphasis on the development of adapted competency models, methods to assess competence and definition of competency standards.

CBTA-related amendments to ICAO standards would be based on these CBTA concepts and principles to ensure a common understanding of the impact of implementation. CBTA should be introduced into Annex 1 as the alternative means of compliance to the prescriptive knowledge acquisition requirements, and the development of CBTA guidance will ensure identification of consistent CBTA procedures and practices regardless of the discipline.

[11] **CBTA: Competency-based training and assessment**. Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

[12] **Competency**. A dimension of human performance that is used to reliably predict successful performance on the job. A competency is manifested and observed through behaviors that mobilize the relevant **knowledge, skills, and attitudes** to carry out activities or tasks under specified conditions (ICAO definitions).

At the moment, it is not yet defined how the CBTA methods will be introduced in the rule and how CBTA output can be credited for the licence, hence the risk of overlap and conflict with the practical skills assessment proposal of NPA 2020-12 is too high.

In view of that, EASA has decided not to include a practical skills assessment proposal in this Opinion.

The proposed solution for maintenance licences regarding aircraft with electric propulsion that are not covered by Part-66 was unanimously opposed because it was considered as not efficiently fulfilling the scope. In consideration of the fact that this is an issue related to a more general regulatory gap regarding non-conventional aircraft (i.e. aircraft other than aeroplanes, rotorcraft, sailplanes, balloons or airships; or aeroplanes or rotorcraft with a power plant other than a piston engine or turbine), EASA has decided to address it within the wider scope of RMT.0731 'New air mobility', and NPA 2021-15[13] now proposes other suitable solutions that supersede the proposal of NPA 2020-12 in regard to potential new licence categories for aircraft with electric propulsion.

Some concerns have been raised regarding the risk to deviate from the required standard if the content of Appendix I is moved to AMC.

Several comments also asked that AMC and GM should provide more guidance for the proposed changes and EASA is keeping this recommendation for the related Decision.

Table A here below synthesises the way forward decided by EASA in virtue of the comments and reactions to NPA 2020-12:

Table A

Issues	NPA proposal	Way forward
Aircraft without TR	Allow the mutual recognition of type training directly approved by NCAs.	Implement the proposal into the Opinion.
	Amend the criteria for Group 1 aircraft.	Implement the proposal into the Opinion excluding certain piston-engine aircraft from Group 1.
Lack of practical skills	Add 'Practical Skill Module' for self-trained students.	Not to implement.
Update of basic knowledge modules	Update Appendix I modules.	Implement the proposal into the Opinion, including the constructive proposals for the improvement received through the comments.
	Move content of Appendix I to AMC.	Implement the proposal into the Opinion, including the constructive proposals for the improvement received through the comments.
OJT issues	Revise the OJT standard.	Implement the proposal into the Opinion, including the constructive proposals for the improvement received through the comments. Revise Appendix II to the AMC for a more flexible and effective selection of the maintenance tasks, focusing also on certifying staff responsibilities.
	Mutual acceptance of the OJT.	Not to implement.
	Move the OJT to Part-145 under the organisation personal	Not to implement.

[13] https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2021-15

Issues	NPA proposal	Way forward
	requirements or qualification scheme.	
Licences for aircraft with electric propulsion	1. Create new 'Group E' 2. Create new 'Module E' 3. TR on Group E after exam/ assessment of Module E.	Not to implement.

CRD 2020-12, to be published together with the ED Decision introducing the related AMC and GM, will provide the details of the comments.

2.6. What are the expected benefits and drawbacks of the proposed amendments

The below analysis includes the potential benefits and drawbacks of the proposed solutions, also reflecting the feedback from Table A above.

Compared to the benefits and drawbacks as presented in Section 2.4 of NPA 2020-12, no new major impacts are expected.

For the proposal on 'implementing new training methods and teaching technologies', the benefits and drawbacks reflect the impact assessment already performed for NPA 2014-22, which is still considered valid and up to date.

Proposal	Benefits	Drawbacks
Allow the mutual recognition of type training by NCAs …	The type training approved as per point 66.B.130 will be recognised everywhere in the EU Member States. The same principle will apply for all the examinations conducted by the competent authorities according to 66.A.200. This improves the harmonisation between Member States and maintains the same level of safety.	No specific drawbacks.
Amend the criteria for Group 1 aircraft	Certain aeroplanes not being complex motor-powered aircraft (CMPA) will be moved to Group 3. For few legacy aircraft, a type examination (now 'type evaluation') and a demonstration of practical experience will replace the need for individual type training. This reduces a regulatory burden by introducing a proportionate requirement for small, old aeroplane models of simple construction. The same level of safety is maintained.	No specific drawbacks.

Proposal	Benefits	Drawbacks
Update Appendix I modules	The basic knowledge requirement has been updated to reflect, through the revised modules, the current aviation technologies. Differences between licence categories (mainly between B1 and B2) are reduced; simpler process to extend the category.	No major drawbacks. Slight increase of the requirements for licence applicants. The licencing authorities may face minor additional costs when implementing this proposal, caused by the required adaptation.
Move content of Appendix I to AMC	Provide future easier update of the modules according to technological evolution. It would give more flexibility to adapt the required changes to the syllabus (without having to amend the IR).	No major drawbacks. Risk of deviating from the AMC leading to less uniform training content. This risk is mitigated by the requirement to issue an AltMOC.
Revise the OJT standard in Appendix III	More effective and efficient OJT programme, focused also on certifying staff competencies and responsibilities. Easier and more flexible selection of the OJT tasks.	No major drawbacks.
Implementing new training methods and teaching technologies	— Additional values into the maintenance training, interactivity, effectiveness and quality of training, variety of training possibilities that could be blended . — Blending of teaching methods improves the efficiency of the training. — Giving legitimacy and a framework to these new methods and technologies may prevent any misuse as the tendency to introduce these methods to approved Part-147 courses is already very strong. — Less CO2 emissions due to reduction in travel. Reduction of the environmental footprint of training by promoting a paperless approach. — Ensure appropriate conformity with the technological development of the aircraft, components, tools, and equipment. — Motivation and engagement of the students attending the course because younger generations are more used to and attracted by learning with digital tools. — Reduction of the duration and the costs of training. The convenience and suitability of the new training methods and technologies may also lead to the reduction of the time spent for learning.	Some organisations may incur transitional implementation costs for the procurement of the training devices and the course software, training the instructional staff for the new competences needed and creation and approval of the new procedures. The NCAs may face additional costs when implementing this proposal, caused by the required adaptation.

In summary, the proposed changes are expected to fulfil industry's needs for efficient and cost-effective training of maintenance certifying staff, while maintaining or increasing the level of safety.

2.7. How we monitor and evaluate the rules

Monitoring is a continuous and systematic process of data collection and analysis about the implementation/application of a rule/activity. It generates factual information for future possible evaluations and impact assessments; it also helps to identify actual implementation problems. The proposal on the indicators to be checked is as follows:

What to monitor	How to monitor	Who should monitor	How often to monitor
Questions and issues about the understanding of the amendment to Part-66	Number of questions/issues received/raised	EASA/NCAs Production and Continued Airworthiness Technical Body (P&CA TeB)	On a recurrent basis, e.g. once every 2 years
Training knowledge standards are equally applied by the training organisations in all Member States	During standardisation inspections in Member States	EASA	According to the Member States' audit plan
Number of AltMoC to Part-66 issued by NCAs	AltMoC notified to the Agency	EASA	On a recurrent basis, e.g. once every 2 years

Cologne, 5 September 2022

For the European Union Aviation Safety Agency

The Executive Director

Patrick KY

3. References

3.1. Affected regulations

— Commission Regulation (EU) No 1321/2014 of 26 November 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 (OJ L 362, 17.12.2014, p. 1)

3.2. Related decisions

— Executive Director Decision 2015/029/R of 17 December 2015 issuing acceptable means of compliance and guidance material to Part-M, Part-145, Part-66, and Part-147 of Regulation (EU) No 1321/2014 and repealing Decision 2003/19/RM of the Executive Director of the Agency of 28 November 2003 'AMC and GM to the Annexes to Regulation (EU) No 1321/2014 — Issue 2'

4. Related documents

— NPA/CRD 2020-12 ‘Review of Part-66’

— NPA/CRD 2014-22 ‘New training methods and new teaching technologies’[14]

[14] https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2014-22