EASA
European Aviation Safety Agency

Evaluation report
related to the EASA maintenance licensing system and maintenance training organisations

02/03/2018

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Executive summary

This evaluation report addresses a legal requirement[1] of monitoring the application of the rules and assessing the impact of their implementation, in particular in relation to the European maintenance licensing system[2] and maintenance training organisations[3].

The specific objective of this report is to identify any existing problems in the system and to collect recommendations on how to address them. Any potential action that stems from this report together with its priority will be formalised in the EASA safety programmes after being assessed with the Preliminary Impact Assessment (PIA) tool.

The main conclusion of this report is that the European licensing system has a strong EU added value and provides a robust system that must be kept, although some areas where there is room for improvement have been identified. Some of the issues identified are:

— difficulty to meet the objectives of the Regulation in some cases, such as the required on-the-job training, update of the content of the training courses with technological evolution or legacy aircraft where there are no available courses;

— less efficient processes due to duplication of efforts, as training courses approved by a competent authority are not mutually recognised by other competent authorities;

— reduction of the efficiency of some processes because of the lack of commercial cases offering specific courses; and

— high impact on the credibility of the maintenance training system due to fraud cases and, in some cases, cultural acceptance of cheating.

A more detailed summary of the received feedback per criterion (relevance, effectiveness, efficiency, coherence and EU added value) can be found in Chapter 4.

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[1] Article 24(3) of Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1) (http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1518171425760&uri=CELEX:32008R0216).

[2] Annex III (Part-66) to 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) (http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32014R1321).

[3] Annex IV (Part-147) to 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) (http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32014R1321).

1. Introduction

1.1. Objective of the evaluation

Article 24(3) of Regulation (EC) No 216/2008 requires the European Aviation Safety Agency (EASA) to periodically monitor the application of the rules and assess the impact of their implementation.

Following this legal requirement, EASA launched at the end of 2016 an evaluation exercise on how effective the implementation of the requirements of the European maintenance licensing system and maintenance training organisations was. These requirements are found in the Annex III (Part-66) and Annex IV (Part-147) to Commission Regulation (EU) No 1321/2014**.**

Intended to assess the current situation, this evaluation aims at verifying whether the rules in Part-66 and Part-147 are fit for purpose, while identifying problems as well as recommendations (solutions) fitting the maintenance licensing needs in a fast-evolving world.

The evaluation is based on the results of the survey which was run from December 2016 to March 2017. The survey was disseminated to the Production and Continuing Airworthiness Member States Technical Body and the Engineering and Maintenance Technical Committee. In addition, the analysis was complemented with feedback obtained by EASA through activities such as standardisation visits to the Member States (MSs) and questions from national aviation authorities (NAAs) and industry stakeholders related to the interpretation of the rules, among others.

All inputs were collected and analysed during the 2nd and 3rd quarter of 2017 and are summarised in this evaluation report which provides conclusions and information about the next steps. The evaluation gives the opportunity to the stakeholders to voice their views on aspects such as:

— interpretation;

— implementation;

— effectiveness;

— improvement;

— standardisation issues;

— level playing field issues;

— oversight;

— omissions or inconsistencies;

— undue administrative burden; and

— structure of the rules.

The results of the report should be further analysed in the PIA 'Maintenance issues'. This would ensure that the evaluation results are fed in the policy cycle and have benefit in the EASA programming process.

1.2. Background of the Part-66 and Part-147 rules

The requirements of the European maintenance licensing system and maintenance training organisations where first stablished with the adoption of Commission Regulation (EC) No 2042/2003[4], in particular its Annexes III (Part-66) and IV (Part-147). In November 2014, Commission Regulation (EU) No 1321/2014 was adopted as a recast of the original implementing rule and all its amendments. Since then, two more amendments have been adopted, Commission Regulation (EU) 2015/1088[5] and Commission Regulation (EU) 2015/1536[6].

In particular, Part-66 had been amended to a large extent since its original issue while Part-147 had only suffered minor changes in comparison with the evolution of the rest of the various annexes to Regulation (EU) No 1321/2014.

At the time of the publication of this evaluation report, the draft regulatory texts proposed through the following Opinions and affecting Part-66 and Part-147 have not been adopted yet:

— Opinion No 05/2015 introducing the B2L and L Part-66 licences; and

— Opinion No 07/2015 introducing a limitation of the Part-147 privileges related to stand-alone basic examinations.

1.3. Participants of the survey

The following entities were targeted in the survey:

— European national aviation authorities (NAAs);

— Part-147 organisations or associations representing said organisations (maintenance training organisations (MTOs));

— Part-145 organisations or associations representing said organisations (aircraft maintenance organisations (AMOs));

— Associations of aircraft maintenance licence (AML) holders; and

— other interested stakeholders.

In some instances, certain EASA MSs further distributed the survey to private individuals or AML holders.
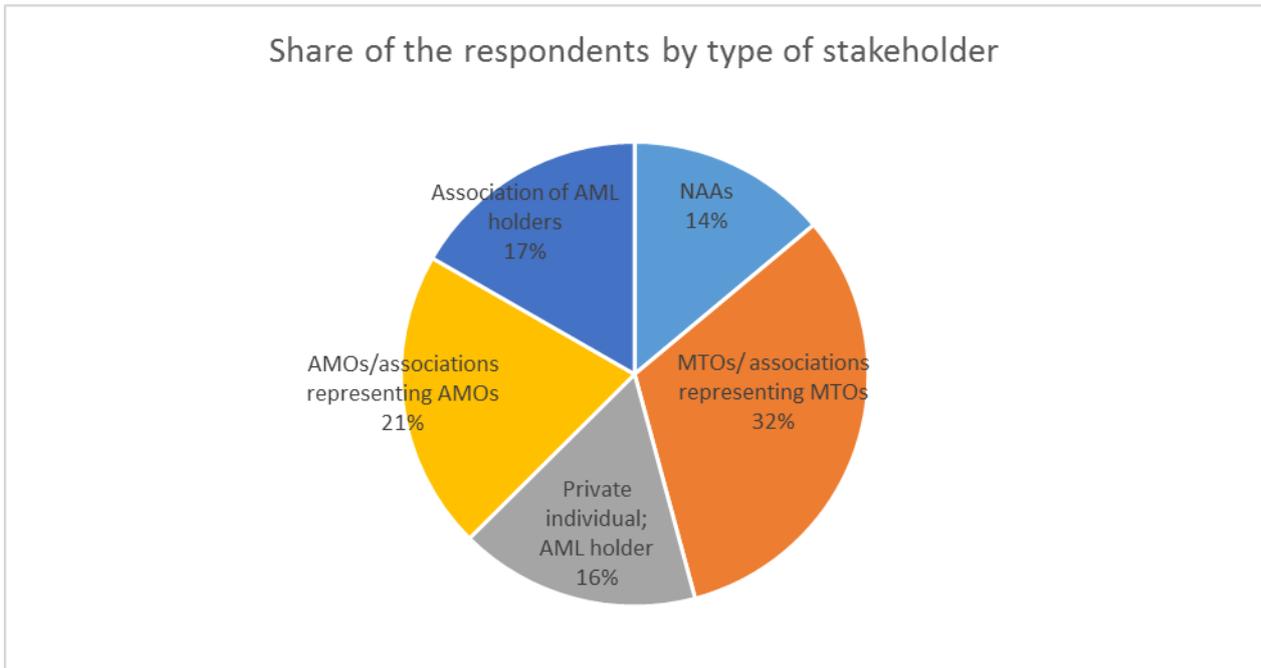
In total, there were 61 responses. The results of the survey are considered 'representative' due to the diversity of the respondents and the entities they represented. In fact, the input collected on behalf of the industry was provided mainly by associations (more than 10), which represent a quite significant number of MTOs, AMOs, and thousands of AML holders. Although most of them are European, some of them have a worldwide impact.

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[4] Commission Regulation (EC) No 2042/2003 of 20 November 2003 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 315, 28.11.2003, p. 1) (http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1518175708874&uri=CELEX:32003R2042).

[5] Commission Regulation (EU) No 2015/1088 of 3 July 2015 amending Regulation (EU) No 1321/2014 as regards alleviations for maintenance procedures for general aviation aircraft (OJ L176 7.7.2015, p.4) (http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1518174595194&uri=CELEX:32015R1088).

[6] Commission Regulation (EC) No 2015/1536 of 16 September 2015 amending Regulation (EU) No 1321/2014 as regards alignment of rules for continuing airworthiness with Regulation (EC) No 216/2008, critical maintenance tasks and aircraft continuing airworthiness monitoring (OJ L 241, 17.9.2015, p. 16) (http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1518175630218&uri=CELEX:32015R1536).

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Figure 1: Respondents of the survey by type of stakeholder

Share of the respondents by type of stakeholder

Note 1: A respondent can be an association representing AMOs/MTOs or AML holders.

Note 2: The number of respondents per category is higher than the total number of respondents, because one answer could have been given by one entity representing several types of stakeholders (AMOs, MTOs or AML holders).

Please note that:

— *All data provided was treated with confidentiality and aggregated in a way to avoid the possibility of recognising any entity or person who participated in the survey.*

— *A list of aggregated comments per individual Part-66/Part-147 requirements has been prepared; however, in accordance with that confidentiality policy, they are not publicly available.*

— *Appendix II to this report lists all the abbreviations used in that document.*

2. State of play: results from the survey

2.1. Simplification of Part-66

2.1.1. Do you think that Part-66 has become too complex?

It does not come as a surprise that the complexity of Part-66 is often highlighted, notably due to:

— the number of categories such as those for light aircraft; and

— the lack of mutual recognition (referring to on-the-job training (OJT), type rating training (TRT) course directly approved by an EASA MS, etc.)

However, several respondents clearly expressed the opinion that Part-66 should be kept as it stands because all these different categories of aircraft meet the need to address the variety of technologies and associated competences: it should not be simplified to the detriment of its robustness, as it works. It is also mentioned that the Part-66 rules are implemented to a lesser degree compared to what happened the past.

Some respondents also consider that the community is quite familiar with the Part-66 and Part-147 rules and this is another reason to keep the rules as they are.

Surprisingly it is also worth noting that some respondents propose:

— more categories such as for cabin or components or airframe repairs; and

— more robust processes, which would make Part-66 much more complex.

To further expand on the latter point, the following items for consideration are:

— introduce more rigorous and/or systematic oral examination by the NAAs; or establish/make the European Central Question Bank (ECQB) mandatory;

— consider competency-based training (CBT);

— put more emphasis on the assessment (practical element) as Part-66 is found too academic; it should be also extended to Part-145 as the review of the competence before granting any certifying staff (CS) privileges is seen of upmost importance;

— deploy more cooperative NAA oversight.

Therefore Part-66 is not necessarily perceived as too complex; however, simplification and legibility are needed. The overall concept should be kept. Wherever possible, the implementation should be improved and better standardised.

2.1.2. Should the basic licence system (AML issuance) be simplified (number of categories, combination of privileges (e.g. B1.1 + B2), simpler qualification requirements, etc.)?

All the various proposals do not help to identify emerging recommendations. However, the following items should be considered for further analysis:

— The privileges attached to the category A AML are misused. They are sometimes granted with no limitation of tasks and subject to abuse (see 66.A.20 (a)1); a better oversight should focus on that aspect. Some advocate that the A category should be discarded for a company authorisation.

— Merge all A.x subcategories into one single category.

— Merge all B1.x subcategories into one single category (one proposal suggests B-Aircraft; B-Helicopter; B-Structure — some others suggest 4 domains: ATA systems and/or powerplant; structure; and avionics); B1.4 is considered as not attractive.

— The AML B2L category is seen as too complex and AML B3 category should thus include more avionics. Other respondents would prefer a system based on avionics equipment lines for non-complex motor-powered aircraft (CMPA).

— Enlarge or combine the B1/B2 privileges; or go for a B1.1 + B2 licence (it would follow the move towards more privileges as already introduced by Regulation (EU) No 1149/2011[7]); or build a modular approach so that B1 and B2, as a result, can be combined.

With the new generation of aircraft, the progression of digitalisation of aircraft and aircraft systems is unstoppable. Nowadays mechanical components are governed by software. In order to help the preparation of the regulations to manage the increasing rate of digitalisation, the following items could be considered:

- Is B2 still needed? Should the privileges be reviewed? Or should more avionics privileges be granted to future B1 AML holders or existing CS? Should the basic knowledge syllabus be reviewed? For instance, a B2 AML holder having a type rating (TR) endorsed could have privileges on the same avionics system when installed on the rest of the same type certificate holder (TCH) family.

- The B1.1 and B2 basic courses are closely aligned today. With a few changes, they could be combined. This would provide the individual with better choice/options, the MTO with better course offers, and the industry with more flexibility in determining the use of their basic qualified personnel. The person satisfactorily completing the new combined course may thereafter elect to train for TRs at B1.1 and/or B2 level.

- Consider whether endorsement for specific systems can be granted to the basic AML holders, e.g. for hydraulic systems — only an AML holder having endorsed the specific TR could release maintenance works on specific hydraulic systems.

— There is not enough commercial attractiveness for the B3 AML category due to the lack of differences between B1.2 and B3.

- Too few Part-147 schools have applied for the B3 AML category in their scope of activities.

- Consider whether a combination of B1.2, B3 and L would be possible to work on piston engines.

- Consider the possibility to extend B3 to 2 700 kg.

- Explore whether B1.2 could be obtained through experience on top of B3.

- Finally review Part-66 to explore alleviations or alignment with future Part-M light (General Aviation)

— The number of L AML subcategories is seen as too complex: consider the need for simplification or combination. Some other respondents recommend the L licence be only based on experience. A power-plant rating could be introduced.

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[7] Commission Regulation (EU) No 1149/2011 of 21 October 2011 amending Regulation (EC) No 2042/2003 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 298, 16.11.2011, p. 1) (http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1518515643494&uri=CELEX:32011R1149).

However some other respondents consider the L/B2L licences as a way forward and complain about the long-awaited adoption by the European Commission.

— Review whether some TRs can be grouped (same engine and no significant difference regarding the airframes/systems; or same airframe with two different engines) even if limitations need to be accommodated.

— Merge CS and support staff;

— Notably for non-CMPA, envisage a licensing system based on airframe systems, engines, structure, electrics/avionics (i.e. competence areas with a modular approach — the engineer starts certifying privileges within his or her competence area at a lower cost and then can build up more competence over time);

— Define only two knowledge levels; level 1 for familiarisation and level 2 for advanced knowledge;

— Better integrate a comprehensive training system that would fully:

- comply with 66.A.25 and 66.A.30;

- be achieved in its totality in a Part-145 or Part-147 environment, so that apprenticeship, practical training and experience could be merged with a benefit of duration as regards 66.A.30 (under conditions to define, such as that all ATAs are correctly covered and the experience is properly recorded).

Note: This would mean that the training programme would be better coordinated between the different organisations. This could be even extended to the TR endorsement when the whole training and programme fully covers an aircraft type (from knowledge to experience).

2.1.3. Would it be possible to provide an alternative to the rating endorsement by introducing the possibility for a 'company authorisation' for specific aircraft or tasks (only valid within the maintenance organisation, but staff can release to service aircraft registered in any Member State)?

A significant number of respondents think it would be a kind of 'regression' — referring to 2002 and before, when there was no common maintenance licensing system throughout Europe, which meant: no mutual recognition of AMLs; no free movement of maintenance staff throughout the EASA MSs; CS privileges dependent on the maintenance organisations and not mutually recognised.

Therefore keeping the TR concept and its privileges is strongly supported, except in the case of legacy CMPA (see Section 2.1.6 of this report). The AML Category A provisions are felt as sufficient for non-complex tasks. This may further explain why most of the respondents consider the Part-66 system appropriate for the EU needs (e.g. labour mobility and privileges) (see Section 2.1.9 of this report).

However, a limited number of respondents push to revert to company authorisation, especially for what they call non-complex aircraft or non-complex operations, breaching into the definition of CMPA or 66.A.5 Group 1 (typically for business operations other than CAT, irrespective of the complexity of the aircraft). To be specific, such an option is proposed for 10T/18 Pax aircraft, small and medium Part-145 organisations, and for lines/systems of avionics equipment or ratings.

2.1.4. Should this alternative be limited to non-complex aircraft?

See the answer to the previous question — therefore there is no obvious recommendation in that direction.

2.1.5. Should this be also possible for B2 licence holders for more complex aircraft (similar avionics equipment lines for a wide range of aircraft types)?

Same answer as above — therefore there is no obvious recommendation in that direction, except the possible option of a B2 group rating per manufacturer (but at an AML level).

2.1.6. Should this be possible for aircraft for which Part-147 type rating training is not available (e.g. 'legacy aircraft')?

For that specific case, a company authorisation is predominantly seen as a suitable avenue to explore. However, some respondents noted that such an alternative should not be seen as an incentive for the AMOs to only deliver company authorisation: it should be only possible when no MTO provides such TRT courses or when no MTO delivers such a course due to absence of economic sustainability.

Finally, a few respondents recommend that only when the TCH is able to provide such a course, the NAA approval of the course should be made easier.

Therefore it can be concluded that a robust mechanism, including a definition of 'legacy', should be essential for the identification of the list of aircraft types at stake. Group 1 aircraft types should be evaluated only when no MTO provides such TRT courses.

2.1.7. Should type rating training courses directly approved by a competent authority be automatically recognised by all competent authorities for the purpose of type rating endorsement in the licence?

Generally respondents found that the TRT courses directly approved by the NAA should be automatically recognised by all EASA MS. The EASA MS, who indeed commented, are overly supportive of that proposal.

2.1.8. Should the current category C licence be kept? Should the 'release to service' requirement for line and base maintenance be reviewed?

A majority proposes to discard the current AML category C for the following reasons:

— This need could be left at the discretion of the maintenance organisation, going for a company qualification for base, if deemed necessary. However, some qualification criteria should be elaborated, such as:

- Keep the '3 years' experience' as a minimum before granting privileges to release to service base maintenance; and

- Assess these staff, who should demonstrate a design engineering or maintenance planning background; a general overview, being able to control heavy work packages (i.e. a second pair of eyes on top of the work delivered by the B1/B2 staff is felt still necessary).

— An end should be put to the academic route or the process should be reviewed in line with RMT.0217 'CAMOs' and Part-145 organisations' responsibilities' as it generates many implementation issues, especially regarding the discrimination between CMPA and non-CMPA.

— The demonstration of experience should not be a means to get the AML or to endorse TRs.

— It may not be needed for general aviation.

For those who want to keep C category, a proposed simplification recommends not to split C between CMPA and non-CMPA or this should be a maintenance organisation's policy. An initial training syllabus should better address that category:

— A module about documentation and navigability is recommended.

— Knowledge specific to their responsibilities should be identified (e.g. what the differences are between line maintenance and base maintenance).

Generally speaking, clear indication of what the responsibilities are when an engineer signs a certificate of release to service (CRS) should be also available. Consideration of the CAA UK document CAP 562[8] is recommended.

The significant social impact of the AML C deletion must be considered before taking a decision.

2.1.9. Are there elements from the FAA licensing system (or any other licensing system) which could be taken into consideration? If yes, which ones?

The overall EASA maintenance licensing system is generally very well supported to the point that there were no major FAA elements suggested. The overall EASA paradigm should not be changed.

It was mentioned that:

— training books for the basic syllabus accompanied by a set of questions for the preparation for examination would be welcome, as it does exist in the FAA system.

— The FAA different levels of training are easier to understand: General Familiarisation = level 1; Ramp and transit = level 2; Line and base maintenance = level 3.

2.2. Maintenance of components

Currently, component CS are qualified in accordance with national rules, which does not create a level playing field within the EASA MSs.

Despite a variety of proposals, a significant number of commenters recommend no change at all to the current system.

However, development of guidance material (GM) is recommended, in order to establish common EU qualification criteria in the Part-145 domain, such as to make use of the following documents:

— JAA NPA 66-3; and

— EASA UG.CAO.00126-003.

Criteria or common standards in AMC to 145.A.30 and 145.A.35 would ensure a better harmonisation throughout Europe, it would be the first step towards a future European system, and would start to achieve a level playing field as recommended by the high-level objectives of Regulation (EC) No 216/2008.

In any case, qualification should be sufficiently documented with detailed records of training.

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[8] http://publicapps.caa.co.uk/docs/33/CAP562_Issue%204Amendment2_15%20December%202017.pdf

Another aspect to consider is the need for a licensing system for the structure specialist(s) carrying out sheet metal or composite repairs because the B1 staff certify maintenance works for which they may not have the competency to evaluate.

2.2.1. Should, instead, component CS be qualified in accordance with company procedures?

As mentioned above, a significant majority of respondents push for some guidance about the demonstration of skill, which should be commensurate with the complexity (i.e. focus on engine, propellers, auxiliary power unit (APU) and avionics/significant line replaceable units (LRUs)/equipment identical for different aircraft types).

Consideration should be given to the training content, the level of training and the practical experience or training needed as well as the criteria about the training providers, before working on components.

2.2.2. Should a Part-66 licensing system be introduced for engines, propellers and other components? If yes, for which types of components?

In line with the first question, only a minority recommends to have, in the future, an EU Part-66 licensing system. The system is already felt complex.

If such a system is developed, as a first approach, it should be limited to engines, APU and propellers and avionics.

An interesting proposal is to start with major components so that it would constitute a modular approach (credits) for those who would like to later get a full B1 AML. One starting point could be the recognition of skilled workers' experience, for those able to demonstrate suitable competence as a component maintenance technician, toward an A or B AML category.

2.3. Practical training (basic knowledge)

Reference: 66.A.25; Part-66 Appendix I; 147.A.200

What are the implementation issues encountered with the 'practical training elements' of the basic knowledge requirements? What solution(s) would you propose to ensure a sufficient level of competence?

Some MTOs during the delivery of TRT courses have observed a lack of basic knowledge and standard practices; a few TCHs and AMOs have also confirmed that some maintenance errors originate from an insufficient basic knowledge.

The following justifications as regards an insufficient level of basic knowledge and basic skills were provided in the survey:

— The need and costs to have a lot of workshops/components for training purposes; MTOs are poorly equipped with real components and tools representative of the technology;

— Access to the latest technology is felt as an issue;

— The availability of actual aircraft (hands-on);

— The implementation of the rules as well as many various interpretations around;

— The absence of standards or minimal guidance such as for composite, sheet metal repairs; and

— The technological hindrance or costs to access the latest teaching, video technologies such as interactive web-based training or goggles with interactive 3D videos, digital aircraft data, etc.

The following recommendations are:

— Better describe the tasks or give a list of tasks with a volume to achieve. Each module should specify the level and nature of the practical tasks (as for Part-66 Appendix III, Table 2); this would prevent too much focus on general modules and not enough on the technical ones:

- The current regulation does not specify which skills must be developed. This leads to significant differences between MTOs, even within MSs. This generates a consequent mistrust by the industry representatives about the level of hands-on capabilities of new graduates.

- A form of competence-based training, with a range of skills linked to maintenance manual standard practices may be beneficial. The high-level rule must be competency-based, outlining the basic knowledge requirements and ensuring that testing is of both knowledge and skill. By providing an EASA knowledge test standard or sufficient GM, requiring the MTO to ensure future-licensed candidates can apply knowledge in a practical manner, this would ensure a better achievement. Such material should be also available for composite/sheet metal damage assessment and repairs or for other repairs.

- Consider the following documents:

  o UK CAA CAP 741 'Aircraft Maintenance Engineer's Logbook'[9] — minimum list/matrix to address the 30 % rule (AMC 147.A.200(d) Section 2);

  o AMC to 145.A.30(e); Appendix II to the Part-66 AMC;

  o ICAO Doc 9868 'Training'; Part III addresses the training and the assessment for aircraft maintenance personnel; competency units, competency elements and performance criteria are described;

  Note: This document is currently being revised by an ICAO group of maintenance experts.

  o FAA AC-147-3B 'Certification and Operation of Aviation Maintenance Technician schools'[10];

  o EAMTC GR 1001 document on 'competence assessment';

  o Available industry standards or equivalent, such as for composite and welding.

- Experienced people that have qualifications and skills from other domains could have their already acquired competences taken into account for the purpose of assessing what training they should have in order that they may demonstrate they satisfy parts of the basic syllabus (refer to the reduction of the practical experience duration for 147.A.200 (d) and 66.A.30).

- Need to reconsider or clarify or remove the rule of 30 % of the practical element in an actual maintenance working environment. Replace it by actual practical training in a Part-145 maintenance organisation through a contract — it could become 50 % theoretical and 50 % practical.

- Knowledge levels 2 and 3 should include practical training.

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9   http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=1309
10   https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_147-3B.pdf

• Propose a list of equipment and parts needed in the workshop.

— Introduce a final practical examination and an 'attitude' assessment. As a minimum, assessments should include maintenance manual standard practice exercises with the skills being tested. These skills should include use of documentation. This examination could be conducted by independent assessors (at least one from other Part-147 organisations or from the NAAs or senior engineers coming from the Part-145 domain or freshly retired). Competences must be evaluated through several exercises (assess, troubleshoot, remove and replace, repair, record, etc.). Several aspects should be verified such as the ability to explain and report; exercise safety and use documentation, demonstrate technical knowledge, understand English and the legislation, etc.

— Create a new module for complex tasks/skills; craft-related skills/crafts and new technology (e.g. wiring and avionics with complex trouble shooting; sheet metal; composite, etc.).

— Introduce a mandatory apprenticeship period in a Part-145 AMO.

— A form of course progress report/overview of a person's progress during training may be helpful. Such things are common in apprenticeships and also in flight training. Considering a 2 400 h B1 course, the MTO has time to get to know their trainees and which their individual strengths and weaknesses are. The good MTO may well then provide coaching, as required in the areas of an individual's weaknesses so that by the end of the training the MTO is assured that the individual has reached a satisfactory level of competence and that the person is fit to go to the real workplace.

— Finally introduce a logbook — it could be used for the whole career of the future AML holder.

2.4. Practical training (TRT in accordance with Part-66, Appendix III)

What are the implementation issues encountered with the 'practical training and assessment' of the TRT course? (See Part-66 Appendix III). How to ensure that trainees receive sufficient hands-on training before the assessment and the endorsement of the type rating in the licence? What solution(s) would you propose to ensure a sufficient level of competence?

The reported difficulties are:

— Risk of damage to an airworthy aircraft;

— Availability and access to a (serviceable) aircraft for an MTO with adequate ground-periods/schedule;

— Availability of real troubleshooting scenarios;

— Too little real hands-on tasks; results too much in 'desktop' with sometimes 'no limits' and not enough practice;

— Access to the up-to-date maintenance issues — a better system should collect in-service maintenance events for the purposes of sharing and training;

— Trainers who do not have the competence nor the up-to-date maintenance knowledge nor the CRS privileges; availability of CS is also reported; and

— Uneven implementation by the MTOS and AMOs as well as a lack of oversight by the licensing authority (e.g. minimalist approach with issuance of a certificate of recognition without details; insufficient audits, etc.).

As a consequence, the quality of the TRT 'practical elements' is varied.

The proposed solutions are:

— Reinforce the basic training. The well-trained and skilled technicians only need to focus on operational checks and tests on the aircraft type, after having received the basic practical element through synthetic training devices (localisation (LOC), troubleshooting scenario, power-up and system energisation, tests, etc.);

— Finalise RMT.0281 as this partially solves the concern; with the emergence of new digital technologies and training methods, it is likely that the share of training using adequate simulation will significantly increase. However:

- it is acknowledged that, if the training could partially be done on virtual aircraft or on synthetic training devices in the future, this would not be 100 % true for all aircraft types, in particular for the old generation of aircraft;

- even with the introduction of the new training technologies, the competence assessment should be performed on the real aircraft/real maintenance environment.

— Indicate how much of the practical training can be done in a classroom or in a simulator or should be real hands-on or on spare parts:

- not sufficiently detailed — clarify essential systems;

- fix a limit in the use of demonstration — give tasks to carry out;

    - too many interpretations exist regarding the '50 % rule' (some NAAs have to accept a certificate of recognition (CoR) only based on LOC/minimum equipment list (MEL)). Clarify the meaning of 'two weeks' and 'hands-on' (see paragraph 3.2 of Part-66, Appendix III and its AMC)

— Introduce a practical element in an AMO under supervision (or grant 'training' privileges to the AMO) as the hands-on training should be on a the real aircraft type;

    EASA note: This option partially exists in Section 6 of the AMC to paragraph 3.2 of Part-66, Appendix III.

— Replace or complete the practical element in a Part-147 environment by OJT in a Part-145 environment (hands-on tasks in an AMO followed by an AMO assessment). Experience/exposure to real operating aircraft may well be what is needed in most cases for newcomers.

- Keep the current system for the experienced AML holders. No need to change the current regulation as exposure to the operating, real maintenance environment of line and/or base maintenance should be proportionate to the experience. This would help to get the duration commensurate with the experience and the training need analysis (TNA) (towards CBT). In such a case, the practical element should be limited to familiarisation (e.g. visit around the aircraft, location of main components, novelties) for experienced CS whereas the training would be longer and subject to a more robust assessment for new AML holders.

- Clarify the differences between the practical training and the OJT, if needed (an AMC and the associated GM could suffice).

    EASA note: FAQ n.19095 already aims at clarifying these differences.

— Introduce a report of 'practical activity' and 'individual performance' as well as an assessment before issuing a CoR — have a logbook to record these elements;

— Ongoing operational suitability data (OSD) support from the TCH; instate the sharing of in-service experience between operators, AMOs, MTOs and TCHs; this should also lead to a continuous review of the CS privileges, based on refresh TRT courses;

— MTOs having no access to real aircraft should not be approved for the practical element of the TRT course. As a minimum, a fixed contract with a maintenance organisation should be in place for the approval. Alternatively, Part-147 MTOs could be approved to provide theoretical TRT courses and practical type training on maintenance training devices (MTDs), maintenance simulation training devices (MSTDs), virtual training devices, augmented reality, etc. whereas the applicant would have to complete a structured OJT on this aircraft type in an AMO with a minimum duration of 10 full working days;

— Reinforce the oversight, the evaluation of the course and the details of TR training records before extending the scope of the MTO activities.

2.5. Robustness of the assessment (any type, e.g. practical training, OJT or evaluation of the CS privileges within a AMO)

Thorough analysis of maintenance-related occurrences strongly supports that deviation from the standard operating procedures and 'attitude' are the major contributing factors to accidents and incidents. How would you reinforce the 'assessment' process? To which extent should the assessment become competency-based? How to measure 'attitude'?

Many respondents consider the assessment as essential, stating though that it is currently too much knowledge-based, not enough competency-based and not sufficiently recorded. They mention many times that:

— the AMO has true, better capabilities to assess the competency;

— 'attitude' over time can only be checked by the AMOs, such as sense of responsibility, professionalism, safety-mindedness, adherence to the standard operating procedures, etc.

Therefore the assessment should be an ongoing process over time (not a one-off), mainly to be performed by the AMO.

Before granting any authorisation to allow the issuance of a CRS, a more robust final assessment should be systematically conducted by the AMO or by the NAA (e.g. for the issuance of a basic AML) or by qualified maintenance staff designated by the NAA. However, an evaluation directly in the workplace is sometimes biased by 'competition' and 'productivity' (to quote a few) when there is an urgent need to grant certifying privileges, notably for recently contracted maintenance staff.

Moving towards CBT is also generally agreed; however, many respondents acknowledged this is a complex issue for which non-sufficient literature is currently available.

Therefore an overall need to reinforce the assessment is suggested; more resources should be dedicated to the assessment process, as follows:

(a) Develop more guidance and criteria:

(1) Introduce more general competency-based criteria applicable to all domains or needs; i.e. differentiate Part-M/Part-145/Part-66/Part-147, when necessary; develop scenario-based guidance toward the goal of returning to service and better assess skills and attitude.

(2) Develop more specific guidance:

    (i) Introduce more safety culture and safety mindset, just culture, compliance with approved procedures, concept of reporting unsafe acts or safety-related information, etc.;

    (ii) Consider documents included in Section 2.3 of this report; further develop the AMC to 145.A.30 (e) and Appendix II to the Part-66 AMC;

    (iii) Indicate specific criteria such as 'more than 10 steps to check this or that'; verify 'air law' competence; check the use of the aircraft maintenance manual (AMM) and compliance; or build pedagogical scenarios where specific situations allow the evaluation of skills, behaviours such as resistance against stress, respect of the operating procedures, time pressure, etc. Attitude should be measured by grading 'observable behaviours' as already the case is for the flight crew;

    (iv) Focus on the areas of special emphasis or higher risks; raise the robustness of examination/evaluation pass mark for these areas;

    (v) Review and expand 145.A.30 (e) and its AMC on 'Competence assessment procedure' as well as 145.A.35 (f), Part-66 and Part-147 each time an assessment is needed; and

    (vi) Ultimately consider the assessment to become continuous and over time (as the case is for pilots, e.g. currency).

(b) Have assessors or supervisors properly trained and qualified; develop a procedure — for instance, nominate a special assessor with qualification criteria — (Re-) Introduce an EASA Form 4 for this category of staff, if needed.

(c) Better formalise the assessment process:

(1) Create a template;

(2) Support by more evidence and several entries over the last 6 months (e.g. several assessors);

(3) Find the right balance between MTOs and AMOs;

(4) Develop a better standard OJT for all aircraft types (ref. to Appendix II to the Part-66 AMC);

(5) Consider the need for a final examination by the NAA or allow delegation of a NAA final examination to maintenance designated, qualified staff (because the AMO is the final end user). For self-starters, assessment of knowledge, skills and attitude (KSA) is crucial and should come:

    (i) before the initial issuance of the AML;

    (ii) after the OJT before the first TR endorsement.

(6) A logbook covering the technician's whole career is recommended, starting with the basic training well before the initial AML application; such a logbook system could include digital devices (e.g. a chip or equivalent system) for identification, compatibility with AML privileges; recording; transferring data, etc.;

(d)   Recommend more NAA surveillance on that aspect, including 'company culture and safety culture'; and more enforcement actions.

Several representative associations have offered their support regarding this issue.

2.6.   Training need analysis (TNA)

Note: Currently the TNA is only required for the theoretical part of the TRT (see Part-66, 66.A.45 and Appendix III).

2.6.1.   Should the TNA also cover the practical elements of the TRT or is the material contained in Part-66, Appendix III subparagraph 3.2, sufficient?

A majority of the respondents are in favour of extending the TNA to the practical element of the TRT.

— The TNA is a good concept and should be an ongoing improvement process. In addition, half of the TNA job is already done through the theoretical element: a well-developed TNA for the theoretical elements almost gives the practical element;

— The practical tasks can be very specific to an aircraft type; therefore an analysis is recommended (duration and content); consequently the TNA could replace the table of Part-66, Appendix III subparagraph 3.2, so that it would provide flexibility and tailored solutions: an analysis is a means to target the needs better than any table of predefined requirements – Downgrading the status of the current table to an AMC could be a way forward with a flexible mechanism to deviate based on such an analysis, which should integrate the OSD outcome.

— The TNA should be more CBT-orientated, taking into consideration the experience of the AML holder and adapting with the content of the OJT for newcomers);

— The TNA should be proportionate to the complexity of the aircraft type or technology. In that sense, the TCH should help to identify the key tasks and the learning objectives of the TRT course, including those addressing the practical element.

For the respondents not in favour of the TNA extension to the practical element, Appendix III to Part-66, subparagraph 3.2 is perceived as currently clear enough.

2.6.2.   Should the TNA also cover the basic knowledge training course?

The replies are very mixed:

— It would make sense to do so and it would ease the approval process and eased standardisation.

— The TNA would also help to capture emerging technologies, new knowledge or skills, etc.

However, Appendices I and II to Part-66 are perceived as sufficient, notably if they are reinforced by the identification of the learning objectives and the development of more guidance about the practical element.

One proposed option would be to make the TNA voluntary — this would be an incentive for:

— the adjustment of the content or the reduction of the duration of the basic knowledge course, as an available option, if CBT is implemented for individuals; and

   EASA note: That option has been available in ICAO Annex I since Amendment 170 but was not transposed in the EASA system due to an initial rejection of the EASA MSs.

— the introduction of alternative training methods, as proposed in RMT.0281.

2.7. On-the-job training (OJT)

Reference: 66.A.45(c); Part-66, Appendix III, Section 6

2.7.1. What are the implementation issues encountered with the OJT, which is required for the first maintenance type rating endorsement?

The main reported concerns are the following:

— When the AML holder is not contracted by the Part-145 AMO or works for an AMO that does not have the relevant TR in its scope of activities, it is difficult to meet the OJT requirement. To quote a few:

- Sometimes the AMO scope of activities is too limited to meet the requirements (e.g. line maintenance only). An OJT programme in a single place is sometimes impossible, notably for the B2 AML category.

- The OJT programme is sometimes felt as too ambitious and takes too much time due to the non-availability of tasks qualifying for the OJT programme.

— The approval of OJT carried out in an AMO located outside Europe, regardless of the organisation being EASA Part-145 approved or not, poses some difficulties:

- The evaluation of OJT and the continuous surveillance outside Europe, including the costs it generates.

- A one-off situation approval is not practical and does not give guarantee over time.

- The mutual recognition between the MSs, even when maintenance organisation exposition (MOE) Chapter 3.15 of the foreign EASA Part-145 approved organisation contains provisions as the EASA approval, does not cover the OJT programme (EASA, which is responsible for the approval, is not a licensing authority).

— Too many differences in implementation among the MSs.

One consequence is the expiration of the three years' validity for the TRT course certificate (see Appendix III of Part-66).

The proposed suggestions by the respondents are:

— Better base the system on CBT and an assessment:

- Focus more on experience and competencies around the maintenance operations of the aircraft type.

- Produce a better list of tasks or matrix suitable for OJT, notably for the 66.A.5 Group 1 aircraft types. A separate list for evidence of practical experience should exist.

  Note: several representative associations offered their expertise.

- Make clearer that the list of OJT tasks as mentioned in Appendix II to the AMC of Part-66 is a 'shopping list', that can be adapted according to certain conditions:

  o No matter the quantity of tasks carried out, the concept of CBT can be used.

  o Clarify (or remove) the 50 % rule in AMC to Section 6 of Appendix III to Part-66 refers: 50 % of every chapter of the OJT list, or 50 % of the list in general, but taking at least some of the

tasks in some chapters, having more tasks in other chapters; or go for a minimum number of tasks (per category[11]) before processing to an assessment that is likely to be successful.

   o Clarify to which extent the list of tasks can be adapted to the nature of the Part-145 organisation (line or base maintenance). For example, if the licence holder works in an organisation approved only for line maintenance, the MS should not request from the candidate to perform tasks typical for base maintenance and should not force him or her to go to another organisation approved for base maintenance.

- Comprehensively record the nature of the OJT, so that acceptance from a distance should not be dependent on an on-site audit (e.g. when OJT is carried out within a 'foreign' maintenance organisation); standardise a logbook or set up a standard.

- When the applicant is mature enough, stop the training and make a detailed recommendation supported by a robust, documented assessment by a Part-145 AMO to the NAA.

- Give more details in an AMC on the purpose and nature of the final assessment of OJT, in line with the already existing FAQ.

- Better ensure the role and qualification of the assessors. Reinforce the oversight on that aspect.

— Indicate:

- the prerequisite needed before OJT starts (e.g. approval with the NAA); and

- the conditions under which OJT (and to which extent) could start before the TRT course (e.g. how candidates who may have already a lot of experience gained on an aircraft type, could benefit from a reduction of the OJT content).

— Envisage experience to be gained on the aircraft type with and alongside an experienced CS member who would act as a mentor. A period of at least 3 months and perhaps as long as 6 months may serve the 'first aircraft type on licence' person better than today's OJT practice.

— See whether tasks could be carried out on groups of aircraft types of similar technology. However, it is admitted that the aircraft type should be preferably the one on which the licence is being sought.

- In case of the addition of a new licence category (i.e. B1.1 to B2), acceptance of the same tasks already performed during the OJT of the first aircraft type in the previous licence category should be allowed — no need of duplication of the same tasks. This should be clarified in AMC.

- If the OJTs for B1.1 and B2 are performed separately, some tasks selected may be identical in both OJTs. If the same task is completed during the first OJT, then there is no need for the repetition of this task during the second OJT. This means the second OJT may be shorter, but considering the '50% rule' (Appendix II to AMC). Once performed, the task can be signed in both worksheets/logbooks with a clear link/reference.

- Call for more recognition of previous experience and implementation of CBT to reduce the length; for instance, in the case of better guidance, assessment and records of the practical element of the basic knowledge (for those who attended such a full programme in a Part-147 organisation) as

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[11] FOT: Functional/Operational Test / GH: Service and Ground Handling / R/I: Removal/Installation MEL: Minimum Equipment List / TS: Troubleshooting

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well as a better programme of maintenance tasks (and records) during the building of the experience as required by 66.A.30, could OJT be merged with the 66.A.30 requirements?

— Clarify whether OJT is required for the 1st type rating in a C category.

— Validity of the TRT certificate: a regulatory mechanism should be introduced so that the NAA should be able to re-credit expired certificates such as re-sit of a type examination:

• Develop a mechanism to allow re-crediting of expired type training, in particular maintenance staff seeking the AML after having already built experience on the aircraft type (e.g. for military people; or non-EU citizens looking for the AML or EU AML holders working outside Europe and not requiring a TR on their licence, etc.); or

• Consider the need to extend the validity from 3 to 5 years.

2.7.2. When approved by the competent authority of the maintenance organisation (through the MOE) where it takes place, should the OJT programme be automatically recognised by any other Member State without any further check?

The replies are mixed. Interestingly, the respondents representative of the industry do not push for a mutual recognition and even some industry representatives would question the mutual recognition if it did happen. The NAAs who responded to the survey are generally in favour of such a mutual recognition.

— Automatic recognition should not be questioned in the EASA system if it were properly implemented; the oversight should thus be reinforced.

— Emphasis should be put on the assessment: when the OJT is correctly implemented, ensuring that a sufficient level of competence is achieved, why the mutual recognition should be questioned, irrespective of its content and duration.

— An AMO should have the privilege to issue an equivalent 'CoR' with appropriate documented justifications; such a procedure approved in the MOE should foster the mutual recognition.

— Mutual recognition could be subject to the 'confirmation' by several NAAs that the process within the AMO is robust (i.e. kind of 'privilege' granted to the AMOs after several evaluations by different NAAs).

However, some respondents are of the opinion that:

— it should be left to the discretion of the NAAs to mutually recognise it;

— the lack of standardisation does not foster that mutual recognition;

— it is too dependent on the types of operations internally to the AMOs; and

— this is subject to 'abuse' — some Part-145 AMOs do not act in a responsible manner. Some applicants would 'go shopping' if all were automatically recognised. Therefore a hazard identification and risk assessment process should be run in order to mitigate this.

A way forward could be:

— more AMC/GM covering Section 3.15 of the MOE; add OJT-related links from Part-66 into Part-145, whenever appropriate.

— more guidance about the assessment and the records;

— introduction of CBT;

— more oversight focus by the NAAs; and

— mutual recognition between the MS.

2.8. Differences training

Are the current provisions for TRT differences training adequate?

Note: See Part-66, Appendix III, subparagraph 1(c).

The implementation of the differences training is not seen as a major issue. However, a few suggestions on how to amend Part-66/Part-147 are proposed:

— The rules should state that both aircraft types must be described in the MTO approval.

— Between two TRs of the same TCH, the differences training should be automatically approved but the TNA should be at the disposal of the NAA auditors; a procedure should describe the process in Section 1.9 of the maintenance training organisation exposition (MTOE) and should suffice: differences training should not be in the scope of approval.

— Being enrolled in differences training courses without having completed a full initial TRT course should not be allowed.

— It should always be clear from which full initial TRT course the differences training is taken.

— TRT differences training from one AML subcategory to another is not described in the rules — this could be allowed, but not without thorough analysis and taking in account all possible consequences. In any case, the required conditions should be described in detail in Part-66; review the definition of 'differences training', if needed; develop GM to clarify several terms such as bridging course.

— Get the OSD or TCH input not only for a differences course between two TRs but also between variants or models within the same TR; clarify the meaning of 'differences training' for two different TRs and for two different models under the same TR (refer to AMC 66.A.20(b)3 or AMC 145.A.35(a); who can do what; simplified tutorials; etc.).

— Clarify the TNA needs; liaise with the TCH (e.g. a TCH has required a differences training whereas no training element was identifiable); the outcome should be at the disposal of the NAA auditors.

— Clarify the need for OJT in the case of differences training.

2.9. English language proficiency

66.A.20(b)4 mentions that an AML holder may not exercise his or her privileges unless he or 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. In the future, would it make sense to introduce a minimum level of English as a prerequisite before issuing the AML? If yes, then:

— *What should be the minimum criteria or syllabus to be met?*

— *Who should conduct the examination?*

All the respondents, except two individuals, are in favour of a system checking the level of English and consider it as urgently needed. Some even advocated that the level of English of the maintenance staff currently contracted by the AMOs should be checked according to an official standard for the sake of safety. The following inputs are hereafter recorded:

— English is an issue during the imparting of TRT courses as it is often noted that an insufficient knowledge of the participants slows down the pace of teaching.

— The NAA should verify the technical KSA as well as the level of English before delivering a licence (e.g. final examination).

— One dedicated module could be created in the basic syllabus of Part-66 Appendix I, supplemented by an oral part, including technical vocabulary and abbreviations. Another proposal is a full integration with Module 10 (Aviation Law Legislation), whose examination should be in English. This means that the examination does not need to be a separate one related to a specific module. For instance, if an ECQB is deployed, its use in English should be sufficient.

— It should not be applicable to English native speakers. Neither should it be mandatory for natives in the countries where English is the official language.

— Regarding the standard, it is recommended to use the provisions similar to the ones existing for the pilot-licensing system — as a minimum, ICAO pilot language proficiency or ICAO Document 9835; some other respondents advocate for an NAA testing or educational boards (e.g. Common European Framework of Reference for languages (CEFR) levels ranging from A2 to C2; Association of Language Testers in Europe (ALTE); Cambridge Assessment English offering certificate examinations such as the Preliminary English Test (PET); the Educational Testing Service (ETS) administering international tests such as the Test of English for International Communication (TOEIC) and the Test of English as a Foreign Language (TOEFL)); or any other designated board. In any case, only qualified bodies should be allowed to run examinations. Whether a Part-147 MTO can run examinations should be discussed, having in mind the current conflict of interest (see 147.A.145 and Section 2.12.3 of this report).

— The examination should focus on technical and common use of English; speaking (communication) and writing skills; as a minimum, the candidate should be able to:

• communicate effectively in everyday situations; and

• read, speak, write and understand elementary technical English.

— No translator should be allowed during the examination to meet the requirement of 66.A.20(b)4.

— English language proficiency could be also the filter to discover cheating/fraud on examinations conducted in English (the vast majority are conducted in English, especially outside EU). It is questionable how a candidate can pass the examination in English without being proficient in English.

2.10. Safety management system (SMS in Part-147)

To which extent would the introduction of SMS requirements into Part-147 be beneficial?

The replies are varied, ranging from 'no' to 'yes' or 'with moderation'. Some respondents considered that SMS would be of no value and an additional burden; some others recommend to identify what is critical in a Part-147 MTO and then just reinforce these identified regulatory processes (e.g. strengthen the requirements

for examination and against fraud; or when a risk of conflict of interest does exist between the trainer and the examiner). The following comments are noted:

— Some respondents consider that improved rules would avoid the need of an SMS for the MTO.

— Other respondents recommend to make some basic SMS elements mandatory. For instance, they require the implementation of a reporting system, e.g. when there is an issue with the trainer; possibility to the students to report to the MTOs, etc. The other SMS elements could be on a voluntary basis — just best practices.

— SMS for MTOs should be proportional to capture critical items; however, it is noted that no system is proposed on how to collect and share information between MTOs, AMOs, TCHs and operators.

— In the absence of TCH support (OSD), an SMS is recommended to identify the safety-critical items of a TRT course.

— An efficient and effective SMS, should it be mandatory or on a voluntary basis, would serve the objective of deploying a risk-based oversight system and extending the oversight cycle by the NAAs, with a focus on safety.

Whether an SMS is made mandatory for the MTOs or just good practices, the following elements should be taken into consideration:

— Proportionality is a necessity.

— Sufficient GM should be developed, notably for the identification of what is critical within an MTO (e.g. training-related risks).

— Promote the need for a positive non-cheating culture;

— Reporting culture, just culture and communication policy should be part of the SMS for an MTO.

— A system to foster the feedback from operators, AMOs, TCHs and students is recommended.

— Introduce provisions for the management of changes.

Finally, it is identified that the:

— principles of SMS should be part of the basic knowledge syllabus (i.e. Part-66, Appendix I); and

— identification of hazards and the assessment of risks should be strictly observed during the imparting of the practical elements of training; notably:

  • introduce more HF, human performance and safety culture — attitude and corporate culture may explain fraud;

  • Focus on the areas of higher risks or areas of special emphasis.

2.11. Activity and performance report (for Part-147 MTO)

Would you support that a Part-147 organisation regularly communicates or makes available an 'activity and performance' report to its competent authority (CA)?

Note: Such report could help the CA to perform its oversight activities as part of the collection and sharing of data in a performance-based environment. By including examination-related indicators, it would also enhance the robustness of 'examinations' — see next questions.

A vast majority of the respondents agree that, with or without an SMS in place, an activity and performance report would be useful and could be an incentive for the extension of the oversight cycle by the NAAs. Anyhow, in general, the NAAs welcome better communication means, data-based meetings and performance indicators.

— This will make the surveillance more consistent and will help to target fraud, especially for the basic training. Safety information or data would make possible the detection of adverse trends or activities that may arouse suspicion. It will also allow the authorities to compare one organisation to another.

— It will be necessary to indicate what to report and how often:

• The frequency could be left at the discretion of the NAA.;

• It should be at least mandatory for the examination-related indicators; this will help to understand why some MTOs have a 100 % success rate or more realistic success rate after manipulation. In addition, what data and how it is collected and analysed, is extremely important for the understanding of the results.

• The debate should address whether this should be limited to basic courses, examinations and to large organisations.

• An AMC should capture the list of data to be collected; this would help to compare or get comparable data.

• The protection of data should be ensured.

— In the case of sharing of data, activity reports, performance reports, etc. this could be done electronically.

2.12. Examination, cheating and fraud

The main collected comments are, as follows:

— The likelihood of fraud or cheating is widely acknowledged as many fraud cases, whistle-blower cases, or AML holders with a poor KSA have been noted or reported.

— The fact that a high number of AML applicants just sat examination (after having being prepared in a non-approved course — just preparation for the examination with sometimes the questions known in advance) is also acknowledged.

— Too many AML applicants show an insufficient KSA, which is seen as a hazard for safety and a labour threat associated with lower wages.

— Fraud as well as corporate culture to cheat is a serious concern, which could weaken the reputation of the EASA licensing system and ruins the efforts of the MTOs with a good performance.

— To a certain extent, the abuse of the examination privileges in accordance with 147.A.145 have economically put at risk the Part-147 business model, making the delivery of a complete basic knowledge course less sustainable.

— The maintenance organisation should not be considered as a training environment for the staff not skilled enough, with the exception of the OJT. Building the basic skills before entering a real maintenance environment is the way forward.

Many respondents request EASA to take appropriate actions, far beyond the outcome of Opinion No 07/2015[12], once adopted:

—   against fraud;

—   in order to better acknowledge the academic path:

- as the training environment is the right place not only to learn (knowledge) but also to build skills and attitude;

- so that the Part-147 business model can be sustainable, adequately reviewing the Part-66/Part-147 rules; and

—   through a better oversight system and enforcement process.

2.12.1. How to improve the robustness of the Part-147 examinations?

Many proposals were expressed, such as:

—   Discard the MTO examination privileges (147.A.145) when the student has not enrolled in a full Part-147 basic knowledge course as per 147.A.200.

—   Introduce an appropriate NAA final oral and written examination as an ultimate safety net:

- for those who only sat for examination or were not enrolled in a full attendance course, introduce an NAA final examination for the practical element of the basic knowledge part; and

- raise the standard, notably for the practical element, as this will discourage candidate with no skills.

—   More NAA surveillance, ensuring that the NAAs better understand their responsibility to audit examinations; recommend NAA to send an anonymous candidate if doubt exists.

—   Introduce an activity or performance report; when it is poor or reveals any weakness, (re)consider the examination privilege.

—   In Appendix II to Part-66, envisage a minimum, sufficient number of questions, well above the rote learning of questions, including the following:

- a more robust design of the questions as answers to the questions can be often guessed (see note 2 below);

- A minimum number of questions (per module) available for the examination and randomly selected.

- An annual rate or questions renewal; indicators such as how often a question for the purpose of examinations is used; a pass/fail rate per question, etc.

- More essay questions should be introduced and the rate of success between candidates should be analysed.

    Note 1: See additional proposals in Section 2.12.4 of this report.

    Note 2: See EASA research project 'Impact assessment of the publication of questions of theoretical examinations for Part-66 and Part-FCL' where a methodology to design questions is proposed.

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[12]   See http://www.easa.europa.eu/document-library/opinions/opinion-072015

— Restrict access to the question database (e.g. the instructor can develop questions but has no access to it); an examination manager could be nominated.

— Qualification criteria for the examiners and assessors should be setup (see Section 2.13 of this report);

— A robust, dissuasive, proportionate enforcement policy is needed, such as an offenders' blacklist; with no re-sit allowable for a minimum of 5 years; revoke the privileges of the organisation (in case of suspicion) or revoke the certificate for the recidivists.

— Improved Part-145 assessment is another safety barrier; report by the AMO to the NAA in case of suspected fraud should be encouraged.

2.12.2. Should the examination privileges as per 147.A.145(a)3 be revoked or limited? Should training be mandatory?

A significant number of the respondents proposed the 147.A.200 basic training to be mandatory — except for general modules (1 to 5?); this would prevent the conflict of interest – in particular, mandatory training is recommended for those:

— who will work on CMPA;

— not having a professional education in a mechanical/electronically aviation-related profession.

To mitigate the impact, provisions for the reduction of the training duration could be envisaged in the case of full attendance to a 147.A.200 basic course.

A quarter of the respondents are of the opinion that the 147.A.200 basic training should not be systematically mandatory; however, a mechanism should:

— allow a greater reduction of 66.A.30 experience under certain conditions in the case of training in a Part-147 organisation; and

— render a final EASA/NAA examination mandatory for those who have not attended a Part-147 training: the skills and attitude of those who have not attended a Part-147 basic course should be systematically assessed; this would discourage candidates to just sit for examination.

Some respondents are in favour of a systematic final EASA/NAA examination , with or without basic knowledge training:

— All knowledge should be tested independently and regularly to determine competency in the area or field;

— Assessment of the skills and attitude (practical element of the basic knowledge) should be mandatory; or

— Introduce a final examination: English and technical KSA should be checked by the NAA before delivering a licence (in this instance, no EQDB would be needed).

An alternative option to keep the examination privileges is a more active NAA oversight role, such as:

— Better surveillance; notably when a conflict of interest is likely to take place.

— Generally speaking, several respondents recommend the introduction of the risk-based oversight principles into the rules; more NAA oversight resources would help exactly where there are Part-

66/Part-147 implementation issues; the oversight cycle should be based on the outcome of the oversight. Similarities to the concept of level of involvement (LOI) as per Opinion 07/2016[13] could serve.

— Random selection of questions by the NAAs; video-surveillance of the examination; unannounced NAA visits; MTO to inform NAAs about the examination dates well ahead of the schedule; analysis of the outcome of the examinations.

— Using the AMO's competent staff to assess in the Part-147 environment; or only designated staff by the NAA within the Part-147 have delegation to run an assessment in accordance with procedures.

— Pooling of NAA inspectors having high expertise in examination is suggested; (partial) transfer of oversight to EASA or another NAA (when not enough NAA resources and competence is available) is also proposed.

There should be more freedom granted to the NAA to reject or quarantine highly suspicious CoR so that additional assessment of the applicant's basic knowledge can be conducted, when doubt exists.

In the case of MTOs located outside the EU, some respondents expressed the opinion that the examination privilege should be revoked because no robust, continuous surveillance is possible from a distance (i.e. limit examination privileges to the EASA territory); some other respondents recommend the AML application to be acceptable only in the country where the AML applicant resides/works.

Finally, as regards TRT, the examination privileges should be kept.

2.12.3. Do you think there is a conflict of interest within Part-147 organisations (they provide both training and examination)?

Conflict of interest between assessors/examiners and trainers is generally acknowledged, except by large MTOs coupled with AMOs, as they are supposed to have enough resources in order to have safety barriers against that potential conflict.

The respondents who do not recognise the conflict of interest, state that when an MTO correctly understands and discharges its responsibilities with training and examination, there is no risk; in other words, this should be more a question of ethics.

It is finally noted that, in no other education sector, there is such a conflict of interest.

Even if a clear separation between 'instructor', 'examiner' and 'assessor' would certainly not solve the issue, it is nevertheless highly recommended to separate the roles. The instructor should never select the basic knowledge questions or assess the candidate. If not possible, the rules should clarify when an instructor can also run examinations:

— Give circumstances and criteria when an instructor is allowed to run examinations (e.g. several set of questions/random selection; teach in one subject but run examination for a different subject); or make a clear separation mandatory.

— Reinstate the EASA Form 4 (or equivalent such as 'ethic code') for the examiners and assessors as this will raise the commitment; in particular, forbid the conduct of any kind of short preparation courses before the conduct of basic examinations.

— Clarify who does what in case of examination and re-takes. Nominate an examination manager.

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[13] See http://www.easa.europa.eu/document-library/opinions/opinion-072016

— Have a code of ethics as well as an enforcement and sanction policy when the MTO staff break the rules.

2.12.4. To which extent should the use of a European Central Question Bank (ECQB) be considered (mandatory, recommended or optional)?

There is no big consensus whether it should be mandatory; however, this should be the case for the following (but not limited to them) situations:

— a conflict of interest is more likely to happen (e.g. small organisations).

— cheating or fraud has been proven.

— there was no attendance to a full basic knowledge course (to avoid short preparation courses).

In the case no ECQB is developed:

— An NAA final examination is recommended because the use of official examination centres poses the risk of making it a business model; the development of a national CQB with the help of the local MTOs could also serve the first step towards an ECQB and meanwhile this will locally solve the language issue; or

— A robust NAA oversight is expected; in particular, the quality of the examination as well as the administration of the examination should be better monitored; or the selection of the questions should be done by the NAA — see proposals in Section 2.12.2 of this report.

— A minimum number of questions per AML category and per module should be made mandatory and questions should be automatically selected though a random system; a minimum number of questions or a rate of questions should be renewed annually.

— The teachers should not have access to the question databases.

— The mandatory use of examination software is recommended: random pick-up; manage the percentage of questions that can be repeated in two consecutive exams; number of questions available; statistical analysis of the outcome; sealed enveloped (if a hard-copy system is kept); compare the outcome when questions are or are not selected by the NAA; analysis done for the purpose of continuously refining QDB quality is far more accurate with thousands of samples rather than dozens.

   Note 2: See EASA research project 'Impact assessment of the publication of questions of theoretical examinations for Part-66 and Part-FCL' where a methodology to design questions is proposed.

An ECQB can only be practical if the following conditions are met:

— The key points are identified — better describe the syllabus, the learning objectives and the competencies to build; have a recommended standard terminology/wording/abbreviations to facilitate the teaching and examination (e.g. teaching books and sets of questions for preparation; etc.)

— The quality of the ECQB matters: it would be unfair to determine an applicant's fate based on anything less than the highest quality testing experience.

— Students should not be in a position to learn the questions by heart (here a minimum number of questions to be annually renewed is recommended, on top of an overall minimum number of questions per AML category).

— Teachers should not have access to the question databases.

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It was highlighted that a further benefit of a common ECQB is 'ease of entry' for a new MTO into the training market. The development and management of a unique and high-quality question data bank is a tremendously difficult and expensive task and a significant barrier to a new school seeking approval and beginning operation. With the existence of a standard ECQB, an MTO could better use its limited resources for material development, instructor training and/or improved shop facilities rather than the otherwise problematic management of individualised question banks.

The ECQB could also be offered as an AMC. However, strong criteria for the approval and oversight of alternative, individualised Question Data Banks usage other than the EQDB should be set up, discouraging such situations. However if, in place, the security standard and fraud protection should be equivalent to the one of the ECQB.

It is also recommended to build an EASA/European database in order to record examination information (candidates, where; number of attempts, etc.); this could be coupled with the need to have a central, European database for the approvals and its scope of activities as well as the AMLs and their associated privileges.

2.12.5. Should examinations be conducted by approved examination centres independent from the Part-147 organisations as it is currently the case for flight crew licensing?

A monitored use of the ECQB from a distance and/or independent examination centres or examiners appointed by the NAA should solve the issue but there is always a risk to make examination a business case (i.e. profit-orientated) for these centres unless they are run by the NAA or EASA.

An alternative proposes these examination sessions to be made by other training centres or run by EU MTOs on behalf of foreign MTOs.

2.13. Instructors, examiners, assessors

2.13.1. Would you recommend qualification criteria for instructors, examiners and assessors? If yes, what are your suggestions for each category of staff?

A vast majority of the respondents support the need for having common criteria embedded in the EU rules. This will also strengthen standardisation.

— Many different NAA standards are available and many NAAs expressed their readiness to share.

EASA note 1: Some NAAs have posted their standards on their websites as well as EASA as for MTOs located outside Europe.

EASA note 2: Qualifications of course developers and instructors are indicated in ICAO Doc 9868 Edt.2, Part I chapter 3 and could be considered.

— Differentiate 'instructors', 'examiners', 'assessors' and differentiate whether this addresses general knowledge, technical knowledge, and aviation legislation knowledge. These criteria should be competency-based and the following should be considered:

- 'English skill';

- pedagogy skills (train-the-trainer course);

- should be only GM or a minimum for core Modules 7 and 11 to 18; just academic diploma for Modules 1 to 4; 9 and 10;

- professionalism and integrity;

- experience in the maintenance domain; and

- requisites for new specialities or new technology.

— For TRT courses, the following should be considered:

- Need to hold an AML (at least for those who will become teachers);

    Note: Not so many were in favour of a specific AML for examiner/assessor, likely due to the impact it would have as too many already-qualified staff would be ruled out.

- A minimum of hands-on period (with release to service?) every 24 months is suggested.

An alternative also proposes no qualification criteria but instead an evaluation whether or not a person can take up the job. The MTOs should be encouraged to train and qualify their instructors. This training and qualification should be assessed. There does not need to be any hard law regarding prerequisites for instructors. Industry should be able to determine who can become an instructor and how.

2.13.2. Does it make sense to introduce the concept of 'subject matter experts' (SMEs) for the development of the courses?

In theory, the answer is 'yes' but the 'size' effect is noted as this would be burdensome for small MTOs. So no obvious suggestion is proposed. The following points are nevertheless noted:

— The SME must be instructor-qualified himself or herself.

— TNA and SME should go together.

— There is no need for the concept of 'SME' but the competence required to either develop or update the course should be described in an MTOE procedure.

— A mechanism should allow SMEs from original equipment manufacturers (OEMs) to better support the development of training material.

EASA note: Qualifications of course developers and instructors are described in ICAO Doc 9868 Edt.2, Part I Chapter 3.

2.14. Development of the course material

What type of support do you expect from the type certificate holder (TCH) for the design, update and approval of a type rating training (TRT) course?

A high number of the respondents stated that, generally speaking, the TCHs are not cooperative enough in the training domain and that a better support for the development of the TRT courses would be expected. The transfer of knowledge from the TCH to the MTO is considered of upmost importance:

— OSD must be enforced urgently as per 21.A.15(d); the process should be ongoing and benefit from the in-service experience; it should be connected with the TNA. It should include variants or models, new technology or/and components;

— OSD data and provisioning of technical publications, as a minimum (to define), should not be used for the TCH to excessively increase the costs. Overpriced documentation is seen as a threat to safety and the TCH cannot also take refuge in the Intellectual Property Rights for not sharing. Conversely, some respondents understand it cannot be free of charge.

— As a minimum, the TCH should indicate the amount of training (minimum content, duration, learning objectives, etc.) – it is noted that too many TRT courses are already below 150 h with uneven duration; the TCH should thus give guidance. In addition, some major airlines or MTOs would like the TNA, training objectives and comprehensive syllabus to be provided by the TCHs. Some advocate for a full course (and its updates) to be provided by the TCHs (against remuneration).

— The TCH should also make available the training differences between models under the same TR.

— Finally, some MTOs advocate for a TCH office in charge of training aspects where they can re-direct their questions or reports of training-related events.

The 21.A.15(d) OSD should trigger a cultural change among the TCHs as transfer of knowledge is considered a necessity for the sake of safety:

— Many respondents consider the OSD a unique opportunity for the TCH to communicate (on a regular basis) the most common lessons learned from incidents; design flaws; errors or maintenance training needs to enhance operations of the aircraft, including identification of the fundamental points of the aircraft; selection of the most relevant work cards; feedback from operations, etc.

— This better mechanism as regards the training issues should interconnect the TCHs, AMOs, CAMOs, MTOs, and thus would foster an effective safety management across domains. Collection and sharing of data such as reliability, occurrences, in-service experience, dispatch of operations, and SMS outcome should serve that upmost objective.

— This ongoing process would assure safety, level playing field, standardisation among the MSs and efficient surveillance; it should stretch up to the update of the basic knowledge (Part-66 Appendix I) needed for the maintenance licensing system; and the orientation towards safety promotion.

Note 1: No Part-147 SMS would be needed if the TCH identifies the critical tasks or KSA needed for a TRT course.

Note 2: Part-66 Appendix III is considered sufficient for the familiarisation TRT course (i.e. level 1 — not critical)

2.15. Structure of the rules and simpler rules

2.15.1. Would you agree with a full restructuration of Part-147 rules close to the horizontal approach?

The alignment with organisation requirements (OR)/authority requirements (AR) close to the structure of Commission Regulation (EU) No 965/2012 (or EASA Opinion No 06/2016) is seen as the long-term approach. In addition, a balanced approach between implementing rules and AMC/GM is recommended (see the proposal in the next question). This approach is further supported by organisations holding several approvals. Only a few respondents prefer to stick to the current structure.

This means that the need to be able to quickly modernise the rules is well received and that alignment with Commission Regulation (EU) No 965/2012 is welcome.

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It is also noted that a better alignment of the Part-147 authority requirements (Section B) with the rules of the other domains, is needed. One respondent suggested the review of Part-147 should take into consideration the FAA AC-147-3B Appendix II (Oversight for the certification and operations of the MTO).

2.15.2. In order to be able to respond to a fast-evolving world, would it be better to have the minimum in the implementing rules (IRs) (i.e. hard law — objective-based requirements providing main criteria) and the maximum in the acceptable means of compliance (AMC)/guidance material (GM) (i.e. soft law, which allows some flexibility)?

The answers are mixed: flexibility is needed but most respondents understand the risk in terms of standardisation.

— The implementing rules (IRs), when too much deprived of information or criteria, are often subject to too much interpretation by the stakeholders; this leads the NAAs to rely more on the AMC/GM and see them as hard law.

— Conversely, the development of more AMC/GM is recommended to ensure a better harmonisation among the NAAs as it would ensure a better surveillance.

Regulator, NAAs and industry alike need a regulatory system that can evolve in a simpler and easier manner in order to cope with the undoubted march of digital technology and its impact on the world of safety, maintenance and training. Therefore the following proposals could be taken into consideration:

— Re-writing and simplifying the IRs so that they only contain the 'must'/'shall have' elements, are many times recommended. The AMC/GM should thus contain the typical 'how to' elements; this would allow flexibility to adapt the rules to rapidly-changing circumstances in a fast-evolving world.

— Foster a balanced approach between IRs and AMC/GM.

— For the critical areas (e.g. examination, assessment), the IRs should be detailed enough and/or prescriptive.

— For the less critical areas, objective-based requirements are considered acceptable when the AMC/GM are sufficiently detailed.

— Introduce the concept of alternative means of compliance (AltMoC) as it will give the necessary flexibility; as proposed in EASA Opinion No 06/2016 for Part-CAMO, EASA should publish this mechanism.

— The more in the AMC, the better and the easier for updating.

2.16. Other comments

The following items stem from comments, which could not be directly associated with one of the survey questions. However, it was felt necessary to keep them for the record.

— Privileges, qualifications and responsibilities: it is recommended RMT.0097 (B1 and B2 support staff) should capture the level of supervision required before issuing the CRS. In addition, the CRS policy needs to clarify the B1/B2 privileges, qualifications and responsibilities.

— It is felt that commercial costs dictate too much the maintenance licensing system and the MTOs.

— Allow an electronic licence (like a credit card) and consider a central European AML database (e.g. European Qualification Framework (EQF)), including the numbers of examination, privileges and currency, etc. Add a picture to the AML template and consider electronic/security features for the purpose of digital signatures and CRS). The same needs to be done for a central database for the organisation approvals.

— Envisage recognition of foreign AMLs when they are based on the EASA system:

  • Some countries have adopted the EASA maintenance licensing system;

  • A mechanism, including audits or based on bilateral agreements, should better recognise the clone systems.

  • Equally consider under which conditions TRs endorsed on foreign AMLs could be EASA recognised.

— Revocation of AML in the case of force majeure: there should exist a legal mechanism allowing the revocation of an issued AML for later identified terrorists; same consideration should be given to AML holders that cannot exercise anymore their privileges for medical reasons. Introduce also (cyber)security requirements addressing the use and protection of private data for the licensing authority.

— Some general comments address the EASA standardisation and the NAA oversight, which should be strengthened, aiming at a better level of confidence between the MSs:

  • Reinstate the Standardisation meeting with the NAAs and invite industry — Standardisation matters may be improved by holding joint EASA-NAA-industry meetings (rather than closed, EASA-NAA standardisation meetings). Industry forums may contribute towards this, provided that EASA continues to support the attendance of its staff at such forums.

  • Safety promotion material may aid standardisation — standardisation benefits everyone by ensuring, as far as possible, the level playing field and its consequent equal qualification outcome values.

  • More oversight is needed on independent CS.

  • National limitations of the AML or limitations of privileges for the AML holders are not consistently applied among the EASA MSs. A common system would provide for simplification and ready easy understanding of the AML privileges.

Note 1: A few respondents acknowledged that there are no 'quick-fixes' for standardisation matters. It is a long, continuous process with efforts required by all concerned.

Note 2: According to Section 2.2 of the survey itself, a list of aggregated comments per individual Part-66/Part-147 requirement has been prepared. However, in conformity with the confidentiality policy for this survey and due to the volume of comments, said list is not publicly available.

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3. Conclusions of the survey

Some respondents praised the initiative to launch the survey and thanked EASA for having given them the opportunity to provide their feedback about the Part-66/Part-147 rules and their implementation.

The benefit of such a survey is the huge amount of concerns, ideas, suggestions or recommendations, which were collected and will serve to improve the overall system or drive it towards the future needs. Such a survey helps to feel the pulse and is a contributor to the identification of future actions.

Generally speaking, most of the respondents consider the Part-66 system appropriate to the EU needs and support the overall concept of the maintenance licensing system in Europe. Considered as 'comprehensive', adjustments are nevertheless needed and simplification should be sought as much as possible. Interestingly, many respondents call for more robust processes such as the development of more AMC and GM, which would make the rules heavier and more prescriptive. Some even wish a more comprehensive system, including a licensing system for the maintenance of the components, the airframe repairs or the instructors or assessors.

In the next sections, the main conclusions and proposals of the survey are categorised in three major areas:

— Regulatory framework;

— EASA standardisation and NAA oversight aspects; and

— Candidates for safety promotion material and frequently asked questions (FAQ).

3.1. Regulatory framework

The received feedback proposed changes to the rules as follows:

(a) Simplification of Part-66 is needed but the respondents acknowledged this is a complex issue.

    (1) Review the number and content of categories to assess whether simplification is possible.

    (2) Consider the need to have a modern licensing system fit for the future generations of aircraft in a more and more digital world.

    (3) Better, mutual recognition among the NAAs would simplify the implementation of Part-66.

    (4) The need to solve the issue of the legacy aircraft is identified as urgent (aircraft falling under 66.A.5 Group 1 for which no TRT course is anymore available).

(b) An update of the Part-66 basic syllabus is needed:

    (1) Clean, update, modernise; address the new generations of aircraft and drones (see Appendix I to this report).

    (2) Transfer Appendix I to Part-66 to an AMC to ease the process to update.

    (3) More guidance about the practical element is needed.

    (4) Consider the need for a final practical examination by the NAA or equivalent designated assessors, notably for students who have only sat for the basic knowledge examination without attending a full course.

    (5) Introduce an examination for the English language proficiency.

(c)   The finalisation of RMT.0281 'New training/teaching technologies for maintenance staff' is requested as soon as possible.

(d)   The reinforcement of the practical assessment is highly suggested

(1)   A more competency-based approach should better target the skills and the attitude at all levels (within MTO and AMO) as the system is found too theoretical.

(2)   Develop criteria for the assessment, which should be better documented and recorded.

(3)   For the whole career of the mechanics, introduce a logbook, in which all assessments are recorded.

(4)   Define qualification criteria for the examiners and assessors within the Part-147/Part-145 domains.

(e)   Detecting and preventing cheating/fraud cases is acknowledged as a priority, as the Part-147 business model is at risk. The provisions proposed in Opinion No 05/2015 are considered not enough. Many various proposals are captured in Sections 2.12 and 2.13 of this report; among others, hereafter a few:

(1)   Reconsider the examination privileges (see 147.A.145), notably for the MTOs located outside Europe; differentiate examination privileges for the theoretical and practical element.

(2)   Introduce an additional assessment for the practical element of the basic knowledge with a more active role of the NAAs in the process, if deemed necessary;

(3)   Reinforce the examination process by any appropriate means: use of examination software; minimum numbers of questions per modules and minimum number of questions annually renewed; random selection of questions; code of ethics for the examiners and trainers and measures against the possible conflict of interest, etc.;

(4)   Introduce an activity/performance report, including examination-related indicators, by the MTO for the purpose of an NAA analysis; monitoring of examination and more active NAA role.

(5)   Or implement the ECQB.

Note: The ECQB is not necessarily the unique way forward; other solutions to make the examination process more robust could be envisaged firstly, as aforementioned (see also the variety of proposals in Sections 2.12 and 2.13 of this report). If the implementation of these new mitigating measures fails, then the mandatory use of the ECQB may be envisaged.

(f)   SMS, development of the training course material; TCH support and continuous assessment of the CS

(1)   The implementation of the OSD must be deployed as soon as possible, which should initially and continuously deliver the key training elements as part of the minimum syllabus at a reasonable price. A better, ongoing TCH support about the training aspects is requested by the operators.

(2)   An SMS is not recommended for the MTO but the critical aspects of the TRT courses should be initially and continuously provided by the TCH with a mechanism to share/update information between TCH, MTO, AMO, operators and NAA — continuously re-train and assess the CS accordingly, as the case is for the pilots.

(g)   Review of the Part-66/Part-147 requirements

(1)   Part-147 requirements need to be updated and aligned with the other domains.

(2)   The Part-66/Part-147 rules should be restructured in a manner that allows that they can be quicker updated by containing more objective-based requirements (e.g. less prescriptive rules) — with details captured by AMC/GM.

(3)   The development of more AMC/GM is recommended with the flexibility offered by the AltMoC. Safety promotion and FAQ could be used more to better explain the intent of the requirements.

3.2.   EASA standardisation and NAA oversight aspects

The following potential topics for consideration are noted:

(a)   Recommend a more active oversight role during examinations and/or assessment as well as a better enforcement policy/sanctions.

(b)   Better oversee how the CRS privileges are:

(1)   granted (i.e. review of the assessment process and OJT, within MTO and AMO; continuous training)

(2)   exercised as regards the AML categories, especially for the AML A category, and the independent CS

(c)   Envisage more cooperative NAA oversight.

(d)   Introduce and implement the concept of risk-based oversight, among others use more NAA oversight resources where there are Part-66/Part-147 rules implementation issues, adapt the oversight cycle to the outcome of the oversight and to the areas of higher risks and establish and use the activities/performance report to target the oversight of the MTO.

(e)   Consider unannounced audits.

(f)   Reinstate Standardisation meetings with NAAs and invite industry;

(g)   Reinforce the oversight and the details of training records before extending the scope of the MTO activities.

3.3.   Safety promotion material and frequently asked questions

The received feedback indicated the following items:

(a)   Role and responsibilities of the CS when the maintenance release to service is emitted.

(b)   Topics where there is no 'quick-fixes' for regulation or Standardisation matters as well as HF items, such as 'the risk of going beyond the AML privileges, including for Category A or for independent CS' or any uneven implementation within the MSs such as 'AML limitations';

(c)   Fraud and cheating.

(d)   Analysis of maintenance-related occurrences strongly supports that deviation from the standard operating procedures and 'attitude' are the major contributing factors to accidents and incidents.

(1)   The human factors should be addressed, e.g. 'distraction';

(2)   Not only the safety culture should be addressed at the level of the individuals but also at the level of the company as such deviations are often embedded in the company culture.

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4. Evaluation of the regulatory framework

4.1. Assessment

The conclusions related to the regulatory aspects in Chapter 3 have been further analysed using the following questions to classify them into the five evaluation criteria in accordance with the EU Better Regulation framework:

— Is the rule useful to the stakeholders? — criterion 'relevance'

— Have the objectives been reached with the results? — criterion 'effectiveness'

— Are the spent resources proportionate to the achieved results? — criterion 'efficiency'

— Are the rules consistent with others which are interrelated to them? — criterion 'coherence'

— Does EU regulatory framework provide an added value to the national system? — criterion 'EU added value'

The table below provides an overview of the main topics, according to the outcome of the survey.

Criterion / ITEMS	Relevance	Effectiveness	Efficiency	Coherence	EU added value
Simplification of Part-66	The number of categories, although numerous, provides a robust system. No need to expand the licensing system to include components. Type rating endorsement in the licence is strongly supported, except for legacy CMPA where no type training course is available.	Without impacting the robustness of the system, merging some categories might simplify the system. The understanding and implementation of the licensing system may be impacted due to its complexity. The current regulation does not provide an effective way of addressing legacy aircraft type rating when there is no course available.	No commercial case for MTOs to offer B3 basic training courses or type rating courses of legacy aircraft because the demand is very low. Duplication of efforts due to the lack of mutual recognition of OJT and type rating courses directly approved by a Member State.	OJT and TRT courses directly approved by the Member States are not mutually recognised.	Request of extension of the mutual recognition to OJT and type rating courses directly approved by a Member State. No added value in considering a European licensing system to component maintenance.
Practical training in basic knowledge and TRT	The rule does not provide enough requirements and guidance to ensure that the candidates have achieved a sufficient practical training level during the basic knowledge course.	The practical training elements are difficult to implement in a real environment by an MTO, which leads among other things to low and not standardised training levels.	In practice, practical skills are often enhanced later e.g. during the practical training elements of a TRT (impacting its duration) or qualification in a maintenance organisation.	Some elements of the flight crew licences could be considered, such as CBT principles.	
OJT	The described OJT is not considered useful to the end user because the objective could be fulfilled in a more flexible way.		The current requirements of the OJT are often not proportionate to achieve the objective of the OJTs.		
SMS	No need to implement SMS in Part-147. As a maximum, a reinforcement of the key items of safety management to avoid fraud.	The system does not provide any incentive for organisations which performs well.	The introduction of an 'activity and performance report' may help to modulate the oversight cycle.		
Examination, cheating and fraud		Processes to detect and prevent fraud and cheating are not robust enough.	The abuse of the privilege to provide examination without a previous training course have economically put at risk the Part-147 business model, making the delivery of a complete basic knowledge course less sustainable.		Request to ensure credibility in the maintenance training system at EU level (the current system can be heavily impacted by the frauds and corporate culture to cheat).

Criterion ITEMS	Relevance	Effectiveness	Efficiency	Coherence	EU added value
Instructors, examiners, assessors and assessments	The rule does not provide enough criteria for instructors, examiners and assessors. There are not enough mitigating measures to address the conflict of interest.	The assessment is an essential element but is currently too much knowledge-based, not enough competency-based and not sufficiently recorded.		It is proposed to follow an approach similar to that for pilots. Pilots need to undergo a recurrent proficiency check to revalidate the validity period of their licence.	
Development of the course material and English language proficiency	Part-66 basic knowledge syllabus is out of date and does not keep pace with the technology evolution.	The maintenance training organisations consider they are not well supported for the TRT courses by the TCHs. The introduction of an English language proficiency requirement may be a filter to discover cheating/fraud on examinations; especially outside the EU the examinations are conducted in English.	The low level of English normally slows down the pace while imparting TRT courses.	It is proposed to follow an approach similar to that for pilots. The standard for the pilot licensing system requires a minimum ICAO pilot language proficiency.	
General comments	Safety promotion may aid standardisation.	To reach the objectives of the rule, the oversight of the MTOs and independent CS should be strengthened.	Efficiency could be improved with the introduction of some paperless elements such as a central European AML database and electronic licences taking into consideration cybersecurity matters.		

4.2. Conclusions

The European maintenance licensing system is appropriate and has a strong EU added value. The mutual recognition and the mobility of the AML holders are two strong assets. The latest Opinions pending adoption will bring a comprehensive system covering all needs and categories of aircraft. The European community has gained experience and maturity in the maintenance rules over time and is now quite familiar with the intents of the rules. The European licensing system is attractive, recognised worldwide and followed by many countries outside Europe.

Nevertheless, adjustments and simplification should be sought as much as possible. As a summary, the following conclusions are drawn based on the previous section per evaluation criterion:

Relevance

— There is strong support to the current type rating endorsement, except for legacy aircraft without available courses.

— The objective of the OJT could be fulfilled in a more flexible way than the one described in the regulation.

— There is no need to implement SMS in Part-147.

Effectiveness

— Without impacting the robustness of the system, merging some categories might simplify the system.

— The practical training elements are difficult to implement in a real environment.

— The Part-66 basic knowledge syllabus is out of date and does not keep pace with the technology evolution.

Efficiency

— There is a duplication of efforts due to the lack of mutual recognition of OJT and type rating courses directly approved by a Member State.

— Practical skills are often enhanced not during the basic training but later, e.g. during the practical training elements of a TRT (impacting its duration) or qualification in a maintenance organisation.

— The low level of English normally slows down the pace while imparting TRT courses.

Coherence

Some elements of the flight crew licensing system could be considered, such as CBT principles.

EU added value

— Credibility in the maintenance training system can be heavily impacted by the frauds and corporate culture to cheat.

— The mutual recognition can be extended to OJT and type rating courses directly approved by a Member State.

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5. Way forward

All potential future actions, coming from the evaluation results, will be analysed through the PIA 'Maintenance issues'.

The PIA is a tool, developed by EASA, to identify possible new actions (regulatory and non-regulatory) in a specific domain. Through this tool, the impact of any possible action will be assessed as well as its priority.

In this respect, the PIA 'Maintenance issues' will identify the best strategy and its timing to solve the identified issues, which could be a rulemaking activity, focused oversight, safety promotion or a combination thereof.

Appendix I — Update of the basic knowledge (Part-66)

The following elements were provided as feedback in relation with Appendix I to Part-66:

— Modernise the basic syllabus and remove 'old' technology elements; antique systems; old generation of components like out-of-date avionics or navigation equipment; better focus on the syllabus for the latest technology.

— Consider the need to expand certain modules' content as regards 'digitalisation', such as health monitoring (e.g. health and usage monitoring systems (HUMS)), remote maintenance, software architecture and aircraft configuration management, on-board maintenance computer and computer skills.

— Consider the need to introduce a syllabus about UAS; electric and hybrid propulsion; tilt rotor aircraft; cybersecurity.

— Module about English (see Section 2.9 of this report).

— Introduce more HF, human performance and SMS, including just culture, safety culture and open reporting culture.

— Introduce the learning objectives.

— Introduce minimal guidance for the practical element — e.g. specify what is needed for the sheet metal/composite repairs; practical training scenarios.

— Advance materials like composite are not covered at the right depth; introduce an AMC 20-xxx about composite (or any other support).

— Need for a practical final assessment.

— Propose a B1/B2 combined AML category — the new generation of aircraft are more and more electro-mechanical and the systems integrate both electrical and mechanical parts.

— Better describe the objectives of the essay questions and how to rate them.

— Be more CBT-orientated — see ICAO Doc 9868 Edt.2 and Section 2.3 of this report.

— Split 'long' modules or allow examinations to be split in Part-66, Appendix II, notably for Modules 11, 12 and 13.

— Try to align some modules for B1/B2 such as Modules 4, 5, 7, e.g. minimal differences.

— Module 15 B1 should try to cover as much as possible module 14 B2.

— Modules 1 to 4: A — some kind of credits for those holding an academic educational degree or high qualifications (make it clearer in Subpart E Section B; this can shorten the number of instruction hours. B — Consider whether this could be covered by the national education system (irrespective of the 'degree' or level of qualification).

— 'Clean' and update Modules 3, 4 and 5 and see to which extent these could be combined and more aligned with the world of digitalisation.

— Propose a better recognition of non-technical modules (i.e. credits) according to Subpart E Section B of Part-66 for technical high schools or academic educational degree.

— Propose training books and sets of questions.

— Consider changing the content of Part-66 Appendix I to AMC — This would help to update it in a quicker manner (i.e. re-writing and simplification of the (IR/hard law) rules so that they contain the 'must'/'shall have' elements — the AMC-GM should contain the typical 'how to' elements).

— Lift the confusion between Part-66 Appendix I, paragraph 2 (chart of modules required for a category A or B1) and Module 4 required for a CAT A (detail in the module breakdown);

— Enhance coherence between Appendix I and Appendix III to Part-66 — e.g. topics that are captured in the type training syllabus but are not in the basic knowledge syllabus; or vice versa — this is the case for helicopters and the tables seem to be too much aeroplane-orientated.

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Appendix II — Acronyms used in this report

ALTE	Association of Language Testers in Europe
AltMoC	alternative means of compliance
AMC	acceptable means of compliance (soft law)
AML	aircraft maintenance licence
AMM	aircraft maintenance manual
AMO	aircraft maintenance organisation (generally Part-145 or Part-M Subpart F or future Part-CAO approved maintenance organisation)
APU	auxiliary power unit
CAMO	continuing airworthiness management organisation (i.e. organisation approved in accordance with Part-M, subpart G)
CBT	competency-based training
CEFR	Common European Framework of Reference for languages (used for language examination)
CoR	certificate of recognition (here, in this report, EASA Form 148 or certificate of training)
CMPA	complex motor-powered aircraft (see definition in Regulation (EC) No 216/2008)
CRS	certificate of release to service
CS	certifying staff
CS-MCSD	Certification specification-maintenance certifying staff data (which should be addressed by the OSD)
EASA	European Aviation Safety Agency
EAMTC	European Aviation Maintenance Training Committee
ECQB	European Central Question (data) Bank
EC	European Commission
ETS	Educational Testing Service
EQF	European Qualification Framework
FAQ	frequently asked questions
GM	guidance material (soft law)
HF	human factors
HUMS	health and usage monitoring systems
ICAO	International Civil Aviation Organization
IR	implementing rule (hard law)
KSA	knowledge, skills and attitude (generally defined as 'competence')
LOC	localisation
LRU	line replaceable unit
MEL	minimum equipment list
MS	Member State
MOE	maintenance organisation exposition (manual of procedures for the AMO)
MSTD	maintenance simulation training device
MTD	maintenance training device
MTO	maintenance training organisation (generally Part-147 approved training organisation)
MTOE	maintenance training organisation exposition (manual of procedures for the MTO)
NAA	national aviation authority (here it often refers to the national licensing competent authority of an EASA Member State or 'competent authority' or 'licensing authority')
OEM	original equipment manufacturer
OJT	on-the-job training
OSD	operational suitability data (see Part 21; 21.A.15(d))
PET	Preliminary English Test
PIA	Preliminary Impact Assessment
RMT	rulemaking task

RMT.0281	rulemaking task about 'New training/teaching technologies for maintenance staff'[14]
SME	subject matter expert
SMS	safety management system
TCH	type certificate holder
TNA	training need analysis (see Part-66, Appendix III, 3.1(d) and its AMC)
TOEFL	Test of English as a Foreign Language
TOEIC	Test of English for International Communication
TR	type rating
TRT	type rating training
UAS	unmanned aircraft system

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

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