

## **The Proposal of the Examination Credits Granting Procedure According to the PART 66**

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### **Abstract**

**Abstract:** This article deals with the proposal of the examination credits granting procedure for aircraft maintenance technicians based on educational attainment. Regulations enable us to grant some of the theoretical exams. Otherwise, the technician must pass these exams via written tests. The first part of the article is about descriptions of the topic and the current situation in the Czech Republic. The second part, which also is the main part, is about the proposal of the credits granting procedure itself. There is a detailed description of the procedure together with a flowchart, and a description of procedure processes in this part. The last part is about a discussion and summarizing of the proposed procedure. The goal of this article is not to criticize national or European aviation authorities but an effort to unify the EU regulations implementing in all member states. The authors react to a situation that occurred in the first quarter of the year 2020 in the CZ. They try to find a solution that would be acceptable by all affected parties.

**KEY WORDS:** *examination granting, modules granting, PART 66, maintenance technician exams, theoretical exams, examination credits*

### **1. Introduction**

For obtaining an aircraft maintenance technician license in the European Union (EU), several conditions must be fulfilled according to Commission Regulation (EU) No 1321/2014 [1]. The basic conditions are to have sufficient practice and to pass theoretical exams in several subjects, hereinafter referred to as modules. Applicants for a license need not be subject to any united theoretical training. In practice, this means that the aircraft maintenance technician can be both a university educated person and a high school student directly in the field of aircraft maintenance technicians, as well as another non-technical field (cook, painter, etc.). Therefore, the level of education of applicants can be very different. This is also reflected in Regulation [1], which allows granting certain modules. Each EU country has the opportunity to apply for these credits in a slightly different way. There is no united detailed description of the credits granting either in the AMC and GM, in the recommended and advisory documents. The unification of the procedure should be ensured by the quality system and audits performed by EASA. Unfortunately, not all EASA auditors have a common view on this matter. In practice, there are relatively large differences in the conditions for the credits granting across member states.

This article deals with the possibility of how it would be possible to eliminate these shortcomings. It proposes a procedure that can be implemented in the current system in place without the need to amend the EU Regulation [1].

### **2. Current State**

The impulse for the creation of this article was, besides other things, the issuance of the CAA-ZLP-121 AML PART-66 procedure [3] by the Civil Aviation Authority (CAA) to fulfil EU regulations. This procedure sets out new rules for:

- transformation of the original Czech AML ICAO and AML JAR-66 to AML PART-66;
- renewal of AML PART-66;
- issuance of new AML PART-66;
- change of AML PART-66 and their extension by new (sub) categories and qualifications;
- cancellation, suspension and limitation of AML PART-66.

The CAA-ZLP-121 AML PART-66 procedure [3], effective from 1 January 2020, replaces the existing CAA-ZLP-052 AML PART-66 [2] and modifies the rules for defining an aircraft maintenance technician license, setting requirements for application for this license, its issue and preservation of its validity. Among other things, it also defines a new approach to the procedure for the credits granting of theoretical exams of aircraft maintenance technicians based on achieved education.

The credits granting of theoretical exams from certain modules based on the achieved education is currently possible according to both specifying procedures [2, 3]. However, this is only in the transitional period until 30 June 2020. Starting from 1 July 2020, it is possible to apply for credits only according to the procedure CAA-ZLP-121 AML PART-66 [3].

According to the procedure CAA-ZLP-052 AML PART-66 [2], credit can be granted from the following modules, if the above conditions are met:

- M1 (Mathematics) – to pass an exam from the subject of mathematics in one year at high school;
- M2 (Physics) – to pass an exam from the subject of physics in one year at high school;
- M3 (Electrical Fundamentals) – to pass the high school-leaving examination in the subject of electrical engineering or to graduate at the mechanical or electrical engineering faculty;
- M4 (Electronic Fundamentals) – to graduate at the Faculty of Electrical Engineering;
- M8 (Basic Aerodynamics) – to own a pilot or flight engineer license or to pass an aerodynamics subject at a university.

According to the new procedure CAA-ZLP-121 AML PART-66 [3], credit can be granted only after proving the syllabus of the subjects from which the candidate requests the credits and these must cover the entire syllabus of theoretical knowledge from the modules. The list of modules from which credit can be granted is the same as for the old procedure [2].

Both procedures try to achieve the greatest possible agreement between the levels of knowledge of the subjects contained in the modules and the subjects that the applicant completed during the education. However, the endeavor is to tighten up these methods, as evidenced by the latest change in procedure.

The syllabuses of each module according to Regulation [1] take into account not only the syllabuses but also the levels. The level defines the depth of knowledge that each maintenance technician must achieve. Regulation [1] defines the following levels:

- level 1 – getting acquainted with the issue;
- level 2 – general knowledge of theoretical and practical aspects of the issue and the ability to apply them;
- level 3 – detailed knowledge of theoretical and practical aspects of the issue and the ability to logically use and combine them.

### 3. Procedure Proposal

This chapter describes the proposed procedure for the credits granting. The flow diagram of the whole procedure is shown in Fig. 1. The whole procedure begins with the submission of an electronic application for verification of the possibility of the credits granting through the website of the Civil Aviation Authority. In today's digital age, the electronic method of administration is very suitable. It is fast, reliable and secure. The electronic application should contain basic information about the applicant (name, place of permanent residence, date and place of birth, etc.). Additionally, the application should include a list of modules that the applicant wants to grant, scans of the required documents and internet links to the Framework Educational Program (FEP) and the School Educational Program (SEP) of the completed high school. If the credits granting have been done based on university education, the link to the Accreditation File (AF) of the graduated study program should be sent.

After analyzing the syllabuses of each module listed in the Commission Regulation (EU) No 1321/2014 [1], the modules that could be granted were chosen. The syllabuses of the chosen modules are focused on general knowledge of the issue and the conformity with the syllabuses of high or university education is significant. The credits from all chosen modules except M8 would be granted based on the certificates or diplomas from high schools or universities. The credit from M8 would be granted on presentation of a valid pilot's license. According to the original documents of the CAA [2], it was possible to grant the credit from M8 based on passing the university subject that was about aerodynamics. After studying the M8 syllabus in the Regulation [1], it was decided that the M8 will not be granted based on the passing the aeronautics subject on the university. The decision has been done due to the high specificity of the Regulation syllabus that is related to the aviation and due to a low probability that the points of the syllabuses in the Regulation [1] and in the study program AF are the same. Modules that can be granted are:

- M1 (Mathematics);
- M2 (Physics);
- M3 (Electrical Fundamentals);
- M4 (Electronic Fundamentals);
- M8 (Basic Aerodynamics).

The documents required for the credits granting procedure should be graduation certificates and year certificates from all grades in which subjects tied to the modules from which the credit should be granted were taught. In the case of a university, it is a diploma and a diploma appendix where all completed courses and subjects are listed. FEP, SEP and possibly AF are used to verify that the syllabuses of the subjects and their levels are in accordance with the requirements of the Regulation [1].

The second step is processing the application. The authorized employee would accept the application and check all data and the attached documents. At that point, the data from the database of high schools and universities enter the system. The database should contain at least the name of the school, the name and code of the study field, a list of modules for which it fulfils the syllabuses and levels given by the Regulation [1], a list of subjects in which the required

knowledge must be achieved and references to FEP, SEP or AF.

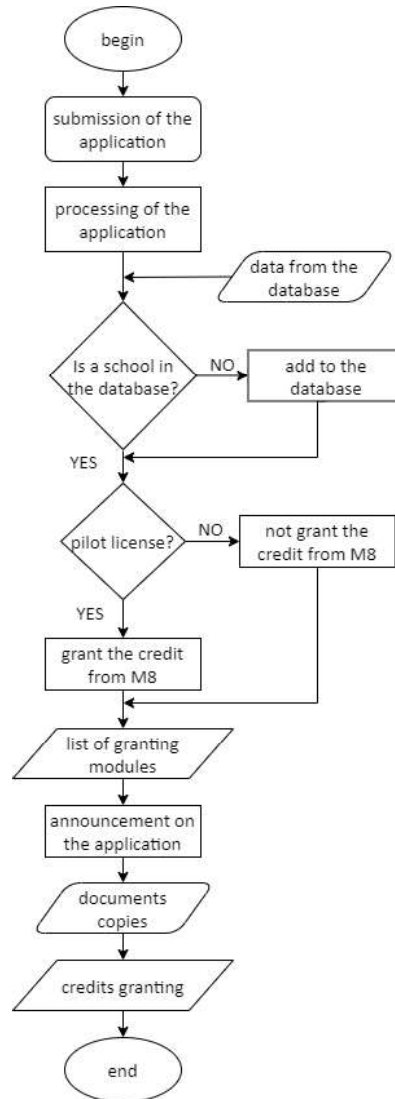


Fig. 1 The flow diagram of the proposed credits granting procedure

In case that the school or university is not included in the database, the CAA employee will add it to the database. The FEP, SEP or AF sent by the applicant serves to this purpose. In each of these documents, the syllabuses of the subjects are written and there are also verbal descriptions of what level students should reach. This fact was verified by the authors through the data and information given in references [4] and [6]. It was found out that the verbal descriptions of the levels in the FEP and other documents at most technical schools, from which most applicants for aircraft maintenance licenses come, correspond to level 2 as defined in the Regulation [1]. In some cases, it corresponds to level 3. The CAA states in its documents [3] that the syllabuses of one subject don't have to be identical with the requirements of the Regulation [1]. The problem can be solved that it will be required to pass more subject to grant the module. For example, the M1 will be granted not only based on passing the mathematic subjects but also informatics where the remaining points of the syllabus, which are not included in the subject of mathematics, are contained. In general, the granting of a single study module may require the passing of several different subjects in high school or university. These subjects will be determined by the CAA employee based on the analysis of FEP, SEP or AF. The school database would be gradually supplemented and if the applicant's school were already in the database, the CAA employee would only verify which modules can be granted.

The next step is to verify whether the pilot's license was submitted with the application. If so, M8 would be granted. If not, M8 would not be granted. Subsequently, a list of granted modules will be created. The condition for the modules granting is the achievement of the required knowledge confirmed by the mark "excellent" (1.0) or "commendable" (2.0) at high school in all subjects that come under the module. At university, the applicant must reach marks "A" (1.0), "B" (1.5) or "C" (2.0). The authors verified the percentage of knowledge that must be achieved to gain the above-mentioned marks. Regulation [1] requires to have minimally 75% for passing the exam (to gain the module). It was found out that obtaining the above marks approximately corresponds to the condition of 75% [5]. Respectively in some cases, the mark "commendable" or "C" corresponds to 70%. Given the fact that the subjects at high schools or universities in many aspects exceed the requirements of the Regulation [1], it is acceptable to tolerate this 5%

difference.

Based on the list of granting modules, an announcement on the application would be sent to the applicant. The announcement would contain information on which modules can be granted together with a request for delivering of officially certified copies of all necessary documents (certificate, pilot license, etc.). Upon delivery of these documents, the applicant would obtain the certificate of possible credits granting. The document would contain, among other things, the list of modules from which the credit can be granted.

The application for verification of the possibility of the credits granting should be submitted at least 30 days before submitting the application of the aircraft maintenance technician license. The license application should then be accompanied by the certificate of the possible credits granting.

#### 4. Software for Procedure

To make effective use of the proposed procedure, it would be appropriate to develop a software – a web application, which would be managed for each EU country by the locally competent aviation authority. In other words, aviation authorities would obtain a tool by which they could grant the credits at clearly defined conditions. The contractor of such software should be the EASA, which would not only gain the unification of procedure within the EU, but would also gain an effective tool for monitoring the credits granting in the member states. This information would be indispensable for possible changes in the education of new aircraft maintenance technicians but also a tool for a quality management system throughout the EU. If it was a web application, it would be appropriate to extend it with the self-authentication part. Each aircraft maintenance technician applicant will fill in and upload the relevant documents himself/herself and in case of a match with the database, they would know the result of the possible credits granting. An authorized employee of the aviation authority would then only check the correctness of the documents and could grant credit without a lengthy study of the syllabuses.

#### 5. Discussion

The proposed procedure is similar to both methods of the credits granting that have been or are used in the Czech Republic. The main difference compared to the procedures used by the CAA is taking into account the both – the given syllabuses and the levels defined by the Regulation [1]. The procedure also takes into account the fact that the syllabuses are given by the Regulation [1] and the FEP or other documents do not have to be 100% identical and proposes a solution in the form of taking into account more subjects in the credits granting. The second difference is the creation of a database of schools. There will be higher time requirements for CAA staff at the beginning of the proposed procedure but after filling the database the whole procedure will be speeded up and simplified. If the procedure proposed by the authors was used, it would be necessary to consult everything with the EASA and the whole system would have to be approved by the EASA.

#### 6. Conclusions

The main aim of the article was to design a possible procedure of credits granting in accordance with PART 66. The proposed procedure should facilitate and unify the credits granting procedure within the EU. Simultaneously, the procedure is proposed so that it can be acceptable by both affected parties (aviation authority and applicant for credits) provided that the conditions of the regulations are met. The current credits granting procedure is correct and try to keep the safety [7] levels as high as possible. As a result, however, there could be a significant reduction in the number of granting credits. However, the authors believe that the EU education is at such a high level that fulfil the requirements of the Regulation [1], and therefore it is possible to use this situation and facilitate the procedure of obtaining the license of aircraft maintenance technician.

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