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Air traffic controller course specifications

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Abstract— **Study program Pilot in specialization Air Traffic Controller is sorted among specific and highly professional study fields, which are part of aviation education at the Faculty of Aviation of the TU in Košice. Since it is a professional field, students receive practical training during their studies and have the opportunity to obtain a License. This license is an exit from the basic training course of air traffic controllers. The objective of the contribution is to identify the specifications of the basic training course for air traffic controllers. Since it is a professional and practically demanding training, the requirements for obtaining a License are also demanding. During training, students must demonstrate sufficient expertise, knowledge of the issue or endurance and ability to solve problems. In the long term, the course leads to a comprehensive development of the skills and knowledge of the student – air traffic controller.**

***Keywords*:** education, Air Traffic Controller, Training, Licence

I. INTRODUCTION

Air traffic controllers shall comply with the relevant essential requirements laid down in Regulation (EC) No 216/2008. They will be issued with a certificate or license after demonstrating compliance with the essential requirements of the Regulation. The European Certificate of Competence has proven to be an effective way of recognizing and certifying the competence of air traffic controllers, who, within their profession, play a unique role in the functioning of safe air traffic management. The Union-wide standard of competence has reduced disparities in this area, contributing to a more efficient organization of work in the current context of growing regional cooperation between air navigation service providers. Maintaining and improving the common licensing system for air traffic controllers working in the Union is an important element of the European air traffic management system. The provision of air navigation services requires highly qualified personnel, in particular air traffic controllers whose competence is demonstrated by a license issued in accordance with the detailed requirements laid down in the Regulation. The qualification in the license should indicate the type of air traffic service that the air traffic controller is authorized to provide. The clauses in the license should reflect the specific skills of the manager and the authority granted by the competent authorities to provide services for a specific sector, group of sectors and / or job position.

The training of air traffic controllers shall include theoretical courses, practical exercises, including simulation and on-the-job training, necessary to acquire and maintain skills for the provision of safe, orderly, and rapid air traffic control services.

Air traffic controller training consists of the following types:

- initial training leading to the issue of a student air traffic controller license or to the issue of an additional rating and, where applicable, a rating endorsement, providing:
  - "basic training": theoretical and practical training designed to teach basic knowledge and practical skills related to basic operating procedures;
  - "qualification training" designed to teach knowledge and practical skills related to a specific qualification category and, where applicable, a qualification category clause;
- on-the-job training leading to the issue of an air traffic controller license, the issue of a rating endorsement, the verification of the validity of a rating or rating endorsement and / or the issue or renewal of a rating endorsement. It consists of the following phases:
  - a phase of transitional training designed primarily to expand knowledge and understanding of site-specific operational procedures and aspects of specific tasks, and
  - the on-the-job training phase, which is the final phase of the training during which the acquired work procedures and skills are integrated into practice under the supervision of a qualified on-the-job instructor in real operation;
  - in the case of a site clause which requires the management of complex and heavy traffic situations, the pre-on-the-job training phase is necessary to improve previously acquired qualification procedures and skills and to prepare for real traffic situations that may occur at the site;
- continuing training designed to maintain the validity of license endorsements, consisting of the following phases:
  - recurrent training;
  - conversion training, if required.

Basic training of air traffic controllers - RLP (teaching of basic knowledge and practical skills related to basic operational procedures) is carried out in accordance with Commission Regulation (EU) No. 2015/340 and EASA Director Decisions No. ED Decision 2015/010 / R No. ED Decision 2015/015 / R, which issued acceptable means of compliance and guidance material (AMC and GM) to that Regulation and other relevant rules and regulations. [1]

Each basic training course is implemented within the university study of the bachelor's study program. Basic student training is carried out in accordance with the study

documentation approved by the Accreditation Commission of the Government of the Slovak Republic in connection with and in accordance with the requirements of Commission Regulation (EU) No. 2015/340 and EASA Director's Decisions No. ED Decision 2015/010 / R No. ED Decision 2015 / 015 / R, which issued acceptable means of compliance and guidance material (AMC and GM) to that Regulation. Individual subjects of basic training are taught within the completion of the subjects of the recommended study plan of the accredited university study program "Air Traffic Control Worker" and verified continuously in the form of semester exams, credits, and graded credits.

The quality of training and compliance with all relevant requirements of regulations and ordinances is ensured by a system of internal quality audits of the approved organization, the professional level of trainers and the supervision of inspectors from the Transport Authority. During the study, the fulfillment and adequacy of the procedures for acquiring theoretical knowledge and practical skills is evaluated.

During the basic training, students go through various theoretical topics, which are based on the above regulations and meet the content standards necessary to obtain a certificate. The basic content of the course is the following subjects:

- SUBJECT 1: INTRODUCTION TO THE COURSE
- SUBJECT 2: AVIATION LAW
- SUBJECT 3: AIR TRAFFIC MANAGEMENT
- SUBJECT 4: METEOROLOGY
- SUBJECT 5: NAVIGATION
- SUBJECT 6: AIRCRAFT
- SUBJECT 7: HUMAN FACTORS
- SUBJECT 8: EQUIPMENT AND SYSTEMS
- SUBJECT 9: WORKING ENVIRONMENT

From the point of view of practical implementation, the course is subject to several specifics. The first is the content complexity of the course, where students acquire the necessary theoretical knowledge. The second specificity is the capacity limit, when a maximum of 15 - 20 students can participate in one course. This aspect is defined mainly due to the individual approach to students in order to increase the practical and complex skills of the student. The number of course participants in individual years is shown in Fig. 1.

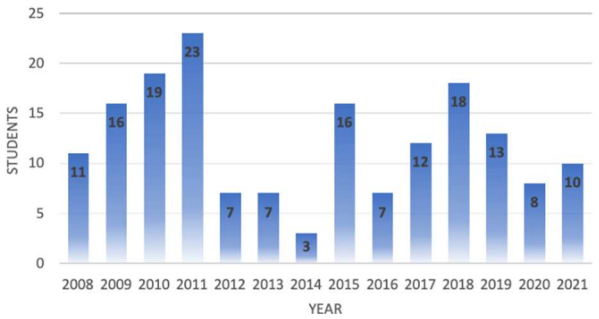

Fig. 1 Number of Students in Basic Training in Individual Years

Upon successful completion of the basic training, the training organization shall issue to the applicant a "Certificate of completion of the ATCO basic training course". Due to the necessary practical training, it is not possible to organize a basic training course in the external form of study. [2]

II. Analysis of Practical Implementation and Licences

A. Student Air Traffic Controller Licence

The student air traffic controller license entitles the holder to provide air traffic control services under the supervision of an on-the-job training instructor according to the rating categories and rating endorsements specified in his / her license and to complete the rating category endorsement. Applicants for a student air traffic controller license shall [2]:

- must be at least 18 years old;
- successfully complete initial training in the training organization;
- hold a valid medical certificate;
- demonstrated an adequate level of language skills at level 4.

The student air traffic controller license shall contain language endorsements and at least one qualification category and, if necessary, one qualification category endorsement. A holder of a student air traffic controller license who has not commenced the privileges associated with that license within one year from the date of issue or has not exercised those privileges for more than one year may commence or continue on-the-job training in that rating until his / her an appropriate assessment of whether it still meets the conditions of this qualification category by the training organization.

B. Air Traffic Controller License

The air traffic controller license entitles the holder to provide air traffic control services according to the rating categories and endorsements to the ratings contained in his license and to exercise the privileges resulting from the endorsements contained therein. The privileges provided by the air traffic controller license shall also include the privileges granted by the student air traffic controller license. Applicants for the first issue of an air traffic controller license [3]:

- hold a student air traffic controller license;
- have completed a course clause course and successfully completed the relevant examinations or assessments in accordance with the requirements;
- hold a valid medical certificate;
- demonstrated an adequate level of language skills in accordance with the requirements.

The validity of an air traffic controller license shall be validated if it indicates one or more ratings and the relevant rating endorsement, station endorsement and language endorsements for which the training has been successfully completed. The holder of an air traffic controller license who has not commenced the privileges associated with any rating within one year from the date of issue may

commence on-the-job training in that rating until he / she has adequately assessed whether he / she still meets the conditions of that rating. training organization.

C. Air Traffic Controller Qualification Categories

Licenses shall contain one or more of the following qualification categories indicating the type of service which the holder of the license is authorized to provide [4]:

- **ADV** - a qualification category for aerodrome aerodrome flight control, which states that the holder of the license is competent to provide an aerodrome control service at an aerodrome that has no published instrument approach or departure procedures;
- **ADI** - instrument rating flight rating, which states that the holder of the license is competent to provide an aerodrome control service at an aerodrome that has published procedures for instrument arrivals or departures;
- **APP** - Approach Procedural Control Qualification Category, which states that the license holder is competent to provide air traffic control services to arriving, departing and overflying aircraft without the use of surveillance equipment;
- **APS** - approach oversight qualification category, which states that the license holder is competent to provide air traffic control services to arriving, departing and overflying aircraft using surveillance equipment;
- **ACP** - a qualification category for regional procedural management, which states that the holder of the license is competent to provide air traffic control service to aircraft without the use of surveillance equipment;
- **ACS** - a rating category for area surveillance, which states that the holder of the license is competent to provide an air traffic control service using surveillance equipment.

A holder of a rating who has not exercised the privileges associated with that rating for four consecutive years or more may commence on-the-job training for that rating only after an appropriate assessment of previous competence to ensure that the person still meets the conditions of that rating. training organization.

D. Clauses for Air Traffic Controller Qualification Categories

Qualification category for the instrument flight control (ADI) shall have at least one of the following clauses [4]:

- **AIR** - an air traffic control clause stating that the holder of the license is competent to control air traffic in the vicinity of the aerodrome and on the runway;
- **GMC** - ground control clause stating that the holder of the license is competent to control the movement of aircraft on the ground;
- **TWR** - an aerodrome control clause stating that the license holder is competent to provide an aerodrome control service. The aerodrome tower control (TWR) clause includes the authorizations of the air traffic control (AIR) clause and the ground movement control (GMC) clause;
- **GMS** - ground observation clause granted to a ground control clause or an aerodrome tower control clause stating that the holder of the license is competent to control ground movements using technical control systems airport movements;
- **RAD** - an aerodrome radar control clause granted to an air traffic control endorsement or to an aerodrome tower control endorsement stating that the holder of a license is competent to provide aerodrome control by means of surveillance radar equipment.

The Approach Review (APS) qualification category rating may have one or more of the following clauses [4]:

- **PAR** - precision approach radar clause stating that the holder of the license is competent to perform a ground-based precision approach service using precision approach radar for aircraft in the final approach phase of landing;
- **SRA** - Surveillance Approach Radar Control Clause, which states that the license holder is competent to provide inaccurate approaches controlled from the ground using surveillance radar for aircraft in the final approach phase of landing;
- **TCL** - terminal management clause stating that the holder of the license is competent to provide air traffic control services using any surveillance equipment for aircraft flying in designated terminal areas and / or adjacent sectors.
- The Regional Procedural Management (ACP) qualification category may have a clause:
- **OCN** - Oceanic Control Clause, which states that the holder is competent to provide air traffic control services to aircraft flying in the Oceanic Control Area.
- The Regional Surveillance (ACS) qualification category may have one of the following clauses:
- **TCL** - terminal management clause stating that the holder of the license is competent to provide air traffic control services using any surveillance equipment for aircraft flying in designated terminal areas and / or adjacent sectors;
- **OCN** - Oceanic Control Clause, which states that the holder of the license is competent to provide air traffic control services to aircraft flying in the Oceanic Control Area.

E. Site Clauses

The position clause entitles the holder of the license to provide air traffic control services in a specific sector, group of sectors and / or in certain positions falling under the responsibility of the air traffic services unit. For air traffic controllers providing air traffic control services to aircraft performing flight tests, the competent authority may impose an obligation to meet additional requirements in addition to the requirements. The habitat clause applies for the period specified in the habitat program to maintain professional competence. This period shall not exceed three years. The period of validity of the site clause at the first issue and renewal shall begin no later than 30 days from the

date of successful completion of the assessment. The validity of the site clause will be extended if:

- the applicant has used the privileges of the license for the minimum number of hours specified in the unit's maintenance program;
- the applicant has completed recurrent training during the period of validity of the site endorsement in accordance with the site's continuing competence program;
- the applicant's competence has been assessed in accordance with the site's continuing competence program no more than three months before the expiry of its site clause.

F. Medical Requirements for the issue of an Air Traffic Controller License

In order to be issued with an air traffic controller license, the applicant must meet medical requirements. There are three classes of medical fitness:

- First class required of the applicant and license holder:
  - commercial pilot of airplanes, airships, helicopters and convertibles;
  - a pilot of a multi-crew airplane;
  - transport pilot of airplanes, helicopters, and convertibles.
- Second class required of the applicant and license holder:
  - air navigator;
  - flight engineer;
  - private pilots of airplanes, airships, helicopters and convertibles;
  - glider pilot;
  - pilot of free balloons;
  - flight attendant.
- Third class required of the applicant and license holder:
  - air traffic controller.

An applicant for a medical certificate shall provide a declaration that he has communicated to the medical establishment or doctor authorized by the Ministry all information concerning his state of health, as well as the state of health of blood relatives and hereditary factors known to him. candidate. The applicant must be made aware of the obligation to provide this information in full, as he is aware of it [5,6].

The medical facility or doctors authorized by the Ministry are obliged to notify the Transport Authority of all those who apply for a medical certificate, but according to the results of the examination and assessment do not meet all health requirements, but their proven abilities and experience can compensate for the health disorder. the exercise of the privileges of the license does not jeopardize the safety of flight. [7]

The level of medical fitness applied in the restoration of medical fitness must in principle be the same as in the initial examination and assessment, except where explicitly stated. When restoring medical fitness, a medical facility authorized by the Ministry may consider proven capabilities and experience that can compensate for the identified health disorder so that the safety of the flight will not be endangered by exercising the privileges given by the license. This is not possible with initial examinations.

G. Language Requirements for the issue of an License

Given that the profession of air traffic controller is a demanding profession that is applied internationally, it is necessary for individual applicants to meet the language requirements. Eligible aircrew must:

- communicate effectively when communicating only by voice (telephone / radiotelephone) or in face-to-face situations (in direct contact);
- communicate general, specific and work matters accurately and clearly;
- use appropriate communication strategies in the exchange of messages and identify and resolve misunderstandings (e.g., verify, confirm or clarify information) in a general or work context;
- to deal successfully and with relative ease with linguistic tasks arising from a complicated or unexpected turn of events in the context of routine work situations or communication tasks with which they are otherwise familiar and they use a dialect or accent understandable to the aviation community.

III. COURSE EVALUATION

At the end of the course, students must demonstrate their skills and knowledge. Examination of students takes place mainly based on a practical exam on LETVIS simulators. The Department of Flight Training of the Faculty of Aviation of the Technical University in Košice currently has a modern simulation center, which is equipped with a system for radar airspace control LETVIS. The simulation center of LF TU in Košice is shown in Fig. 2.

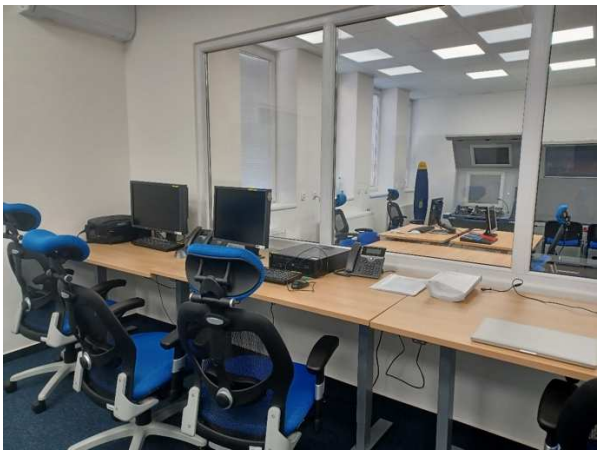

Fig. 2 Simulation Center at the Department of Flight Training situated in LF TU in Kosice

The LETVIS system is a system for the planning and procedural management of air traffic. The processing format is defined by valid regulations and user requirements.

An evaluation form is used to evaluate the student's final exam, within which four basic skills are evaluated:

1. Securing Spacing - In this area, students must demonstrate knowledge in securing and applying spacing, identification, detection of potential collisions, orderly flow, speed adjustment, compliance with regulations, procedures and guidelines, control of incoming and departing aircraft, aircraft guidance, aircraft control in proximity to the airport, the transmission of position and conflict information and in ensuring the flow of air traffic.
2. Management activity - in this area, students demonstrate skills such as the speed of decision-making in resolving the situation, the correctness of the measures taken, the procedure in accordance with directives and agreements, respecting the priority of activity and compliance with safety criteria.
3. Radiotelephony procedures - in this area demonstrate skills in the correct phraseology, speed, and clarity of issuing instructions and information, setting communication priorities, and issuing flight permits.
4. Workplace activities - in this area, proper and legible record keeping, coordination in accordance with procedures and agreements, pre-flight and preliminary preparation for the exercise is assessed.

To successfully complete the course, it is necessary for students to obtain at least 75% in each monitored area. In safety-related areas, students need to receive 100%. The success rate of completing the basic training course is up to 20% every year.

Despite the demanding conditions and the relatively low success rate of the basic training course, 99% of students studying the Pilot Department in the Air Traffic Controller specialization enroll in the course every year. An example of a practical test is shown in Fig. 3.

Currently, great emphasis is placed on educational processes that are closely linked to practice. Educational processes based on practical approaches thus increase the possibility of achieving higher applicability of students in working life.

The Pilot study field in the specialization of Air Traffic Controller enables students to acquire the required skills and knowledge also thanks to courses.

Although the basic training course is thematically comprehensive and demanding the student's complex skills, students have the opportunity to obtain a certificate, which represents the first milestone in their working life. The conditions for obtaining are relatively demanding, especially in the area of medical and language competence.

Fig. 3 The Final Process of Practical Exam

IV. CONCLUSION

The article presented the specifications resulting from the course of basic training of students in the specialization of air traffic controllers. The course of the course is characterized primarily by an individual approach, which is time-consuming and content-intensive from the pedagogical area and linguistically and thematically demanding by the students. Despite such requirements, there is great interest in the basic training course on the part of students. The reason is the fact that the obtained certificate increases students' applicability in practice

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