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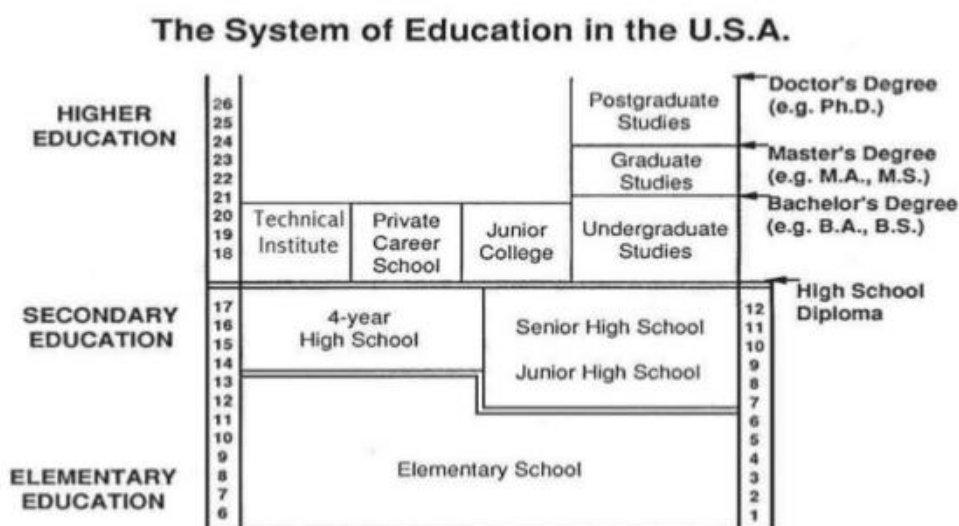
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FUTURE AIR TRAFFIC CONTROLLERS' PREPARATION IN THE COLLEGIATE EDUCATIONAL SYSTEM OF THE USA

Preparation of future air traffic controllers is analyzed in the article as significant part of higher education in the USA. Main American institutions which are approved by Federal Aviation Administration for future air traffic controller preparation are been considered in this paper. The system of higher education has been characterized according to education degrees which are associate, bachelor, magister, doctor and especially in aviation education. The basic concept of Approved Air Traffic Collegiate Initiate Program for Future Air Traffic Controller preparation and outstanding role of preparation in the future ATC formation is represented below. Basic focus of this article is key role of American Federal Aviation Administration in formation and operation of the aviation industry in general and especially in development and improvement of professional air traffic controller preparation.

Key words: future air traffic controllers preparation, educational institutions in USA, Federal Aviation Administration in USA, Air Traffic Collegiate Initiate Program for Future Air Traffic Controller preparation, aviation specialist.

Civilian training for Air Traffic Controller career can be obtained by several approaches including military training, foreign hires, on-the-job training, collegiate training and ab initio training. In the context of our research the most relevant is collegiate or academic training. Our article deals with the system of education in the USA, and especially with the role of future Air Traffic Controllers preparation in this system. For better understanding of the education system of the USA we used the scheme of the USA Educational Department.



USA Educational System consists of the elementary education, secondary education and higher education. Key element of our scientific work is higher education which is represented by undergraduate studies, graduate studies and postgraduate studies. Undergraduate students can receive Associate or Bachelor Degree.

An associate degree can be defined as «an award that requires completion of an organized program of study of at least 2 but less than 4 years of full-time academic study or more than 60, but less than 120 semester credit hours». Unlike certificate and diploma programs, the associate degree is a recognized higher education degree [1]. Most associate degrees earned in academic programs are Associate of Arts (AA) or Science (AS) degrees. Associate degrees earned in professional, technical or terminal programs are frequently called Associate of Applied Science (AAS) degrees, but will sometimes carry the name of the program of study in the title. Future ATC can also receive Associate Degree but it is not enough and they need continue their education and receive Bachelor Degree.

The Bachelor's Degree is the most common first degree in U.S. higher education and is the degree that gives access to advanced studies. U.S. bachelor's degrees are usually planned to take 4 academic years of full-time study to complete. Examples of bachelors are Bachelor of Education (B.Ed.) or Bachelor of Science in Education (B.S.Ed.), Bachelor of Science in Aerospace Engineering (B.S.A.E.), Bachelor of Engineering (B.E.B.Eng.), Bachelor of Science in Engineering (B.S.E.B.S.En.), Bachelor in Science in Civil Engineering Technology (B.S.C.E.T.), Bachelor of Technology (B.T.B.Tech.). Graduate students have an opportunity to receive Master's Degree.

The Master's Degree is the first graduate-level qualification, or second cycle degree, in the U.S. higher education system. Master's degrees may be considered terminal professional degrees in some specific fields. Master's degrees generally take two years to complete, but the time period may be shorter or longer depending on how the degree program is structured (12-month versus 9-month academic years, for example), whether the student is enrolled full-time or part-time, the degree requirements and the prior preparation of the student. Numerous scientific resources inform that there are Master of Engineering (M.E./M.Eng.), Master of Science in Engineering (M.S.E.), Master of Science in Aeronautics and Astronautics (M.S.A.A.), Master of Aerospace Engineering (M.A.E./M.S.A.E.).

Some students may require additional preparation prior to undertaking certain types of research, or may require interdisciplinary training if their research field crosses subject fields or if they have changed academic subject concentrations from the undergraduate level. U.S. Doctorates are structured programs of advanced study and supervised research. Students admitted to Doctoral programs must complete all qualifying graduate-level coursework and participate in Doctoral seminars and colloquia.

U.S. Department of Education, National Center of Educational Statistics and Integrated Postsecondary Education Data System inform that there are Subbaccalaureate certificates and degrees and Baccalaureate degrees in such program categories as aircraft mechanic (airframe), aircraft mechanic (powerplant), aviation systems (avionics), airway sciences, aircraft pilot (navigator), aviation management, air traffic control, flight attendant and aviation workers and others. This information underlines that fact that there a lot of ATC are subbaccalaureate degree programs and baccalaureate degree programs in USA.

It is important to mention that there were a lot of surveys aimed to find out the number of institutions with an aviation degree programs. So one of such surveys showed that there were 205 institutions with aviation programs, 93 were baccalaureate degree-granting institutions and 112 were associate degree-granting institutions. 53 of these institutions reported that that they actually have modern recognition from Federal Aviation Administration Airway Science Program. Total enrollment of students in such institutions were more than 41,000 students. Among them 16,000 students were pursuing flight education programs, more than 10,000 students were pursuing maintenance programs (both avionics and electronics), 5,500 students were pursuing aviation management programs and 10,000 were pursuing programs in air traffic control and aviation computer sciences.

Moreover, Federal Aviation Administration brings a lot of requirements to candidates for air traffic controllers career [5]. These requirements both have administrative and organizational character but in our research we would focus on their educational side. To become an air traffic

controller, it is compulsory to have educational aviation degree in one of the Federal Aviation Administration approved institutions. This approved institution offers a special program which is called Air Traffic Collegiate Initiate Program (AT–CTI) for Future Air Traffic Controller preparation [3]. AT–CTI program focuses on the development of the broad-based knowledge of the air traffic management system, FAA, aviation industry and principal topics covered in many existing aviation degree programs [2; 4].

In our article it is reasonable to name the most outstanding approved AT–CTI schools, among them University of Alaska in Anchorage, San Antonio College in California, Embry-Riddle Aeronautical University in Florida, Embry-Riddle Aeronautical University in Arizona, Miami-Dade College in Florida, Purdue University in Indiana, Arizona State University, Community College of Baltimore County, Community College of Beaver County, Florida Institute of Technology, Florida State College at Jacksonville, Green River Community College in Washington, Jacksonville University, Texas State Technical College, University of North Dakota, University of Oklahoma, Vaughn College of Aeronautics and Technology Flushing in New York and others.

The Federal Aviation Administration created a network of partnerships with colleges, universities and trade schools meant to prepare graduating students to pursue their goal of a career in aviation with FAA. This effort is known as the Collegiate Training Initiative (CTI). Therefore successful completion of the degree programs does not guarantee employment in FAA, however it influences on future aviation career greatly.

As it was said earlier there are certain fundamental requirements in order to qualify for hiring by FAA as an Air Traffic Controller. When students enter on Collegiate Training Initiative they:

1. Must be a citizen of the USA.
2. Must not be older then 30 upon date of hiring by the FAA.
3. Must successfully complete the FAA Air Traffic Selection and Training (AT–SAT) prequalification exam. AT–SAT exam is six and one half hour computer-based exam designed to identify cognitive skills needed by air traffic controllers. This exam is recommended to pass at the early beginning of the AT–CTI program. After passing this exam is necessary to become an Air Traffic Controller, meanwhile taking the test early may determine whether you can take part in the program preparation. Air Traffic Selection and Training prequalification exam usually consists of the Multiplex Controller Aptitude Test (MCAT), the Abstract Reasoning Test (ABSR), Occupational Knowledge Test (OKT). If the applicant scores at least an 85% on the AT–SAT, he is selected for further examinations.
4. Must complete an Associate of Science (A.S.) Bachelor of Science (B.S.) Degrees at the FAA approved institutions that were mentioned above.
5. Must have recommendation from educational institution based on students academic record and comprehensive exam.
6. Must have excellent English.
7. Must pass security and suitability test by FAA. This investigations shows all violations that were made by student, for example crimes, driving while intoxicated or under influence of alcohol.
8. Must pass a medical exam. Usually areas that are examined are cardiovascular, hearing, vision and color vision. It is recommended to receive FAA Class II in order to know you chances beforehand.
9. Must complete FAA representative interview and also pass psychological test.
10. Must successfully pass pre-employment drag test. This is periodical kind of test in FAA.

It goes without saying that FAA primary goal is to develop such technical training and developmental programs of ATC as to ensure that fact that their ATC have all necessary skills and abilities to perform their work effectively and without risks and in order to maintain the safety of the National Airspace System. That is why here is a numerous amount of specialized documents and one of them is FAA Order 3120.4. Air Traffic Technical Training, and it is reviewed annually to ensure its technical accuracy.

FAA Academy also took part in training process of future ATC. There candidates gain foundational ATC knowledge through classroom and simulator training. Later at field facilities they receive additional classroom and simulation training and then on-job training to become certified professional controllers (CPC). By the way all controllers are assigned proficiency training which is compulsory part of their job.

New controllers are trained in FAA Academy in Oklahoma City. FAA Academy uses all modern approaches in studying, lectures, computer-based instruction, and simulation with a range of fidelity. Basic knowledge conception is concentrated on the ATC development by teaching common, fundamental air traffic procedures that are used through the country.

It is important to understand that air traffic control preparation is a part of huge American aviation system which is developing in enormous steps. Furthermore, it also worth mentioning that ATC preparation has consistent character, which means that pupils from the school started to get acquainted with the aviation sphere and are taught basic aviation disciplines. STEM (Science, Technology, Engineering and Math) education is also one of the American ways to promote aviation education. Moreover government and Federal Aviation Administration play particularly outstanding role in the future ATC preparation. FAA controls future ATC specialists on each step of their career from the AT-CTI program to the future on-job training and even their future career promotion.

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Красножон В.О., аспірант, інженер навчального відділу Кіровоградська льотна академія Національного авіаційного університету

Підготовка диспетчерів управління повітряним рухом в освітній системі США.

В статті проаналізовано підготовку майбутніх авіаційних диспетчерів обслуговування повітряного руху в рамках системи академічної освіти США. Розглянуто основні американські учбові заклади, які схвалені Федеральним авіаційним агентством США для підготовки майбутніх авіаційних фахівців. Охарактеризована система вищої освіти у США з точки зору освітніх рівнів – асоціат, бакалавр, магістр, доктор, зокрема і в авіаційній сфері. Розкрито основний зміст схваленої початкової академічної підготовки авіаційних диспетчерів і роль даної підготовки у становленні майбутніх авіаційних спеціалістів. В статті особливо акцентована роль Федерального авіаційного агентства США у становленні і функціонування авіаційної галузі у цілому і зокрема у розвитку і вдосконаленні професійної підготовки диспетчерів обслуговування повітряного руху.

Ключові слова: підготовка майбутніх авіаційних диспетчерів, вища академічна освіта США, Федеральне авіаційне агентство США, схвалена початкова академічна підготовка авіаційних диспетчерів, авіаційний спеціаліст.

Abstract

Future Air Traffic controller preparation has been analyzed in the article as a part of single American collegiate educational system. Firstly, main outstanding universities, academies and colleges have been reviewed. All above mentioned educational institutions are approved by Federal Aviation Organization for future Air Traffic Controller Preparation. The basic structure of the USA educational system was represented in the scheme above and characterized according to its main levels. The system of education in the USA consists of elementary, secondary and higher education. Moreover, the third level of the high education can be divided in to two vectors. The first one is subdivision of higher education according to the types of institutions, among them technical institutions, private career schools, junior schools, academies and many other types of colleges. The second vector covers studies which can be undergraduate studies, graduate studies and postgraduate studies. It relates to all aspects of educational spheres and especially to the aviation education in fact. It is significant to underline the fact that while student studies as an undergraduate he may reach Bachelor's Degree (B.A., B.S.) in the sphere which he had chosen earlier. Correspondedly, after studying on graduate level student may reach Magister's Degree (M.A., M.S.). Numerous scientific resources inform that there are Master of Engineering (M.E./M.Eng.), Master of Science in Engineering (M.S.E.), Master of Science in Aeronautics and Astronautics (M.S.A.A.), Master of Aerospace Engineering (M.A.E./M.S.A.E.). All above mentioned Magister's Degrees give opportunity to the students to be ATC what is the most significant detail in our research. It is worth to mention that postgraduate studies as a part of higher education system in the USA give opportunity to reach Doctors Degree (Ph.D.). It is quite significant in my opinion that the main context of the Air Traffic Collegiate Initiate Program (AT-CTI) for Future Air Traffic Controller preparation was opened. There was underlined the role of AT-CTI for Future Air Traffic Controller preparation in the development and operation of the USA aviation system. The important focus of the article is outstanding role of Federal Aviation Administration in American aviation educational sphere, Air Traffic Control management and future ATC workforce preparation, training and improvement.

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