THE CONFERENCE “AEROSPACE TECHNOLOGY, MODERN MATERIALS AND EQUIPMENT” – IS THE PLATFORM FOR THE DEVELOPMENT OF AVIATION ENGINEERING EDUCATION IN RUSSIA

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Abstract. This article provides information about the history, organizers, and participants of the conference in the framework of exhibition Aerospace technologies, modern materials and equipment - ACP Conference. It reviews the most interesting reports on the subject of Design in the Field of Education, and perspectives of the conference, as well as its role in the establishment of international relations, including with China.

The Republic of Tatarstan has great industrial potential and is one of the leading regions in the field of aerospace technology in Russia. The aerospace complex of Tatarstan consists of a large number of enterprises and research organizations which are well-know throughout Russia and all over the world, and include such entities as; Kazan Aviation Factory, Kazan Motor Production Association, Kazan Helicopter Factory and others. In this regard, it is not surprising that Kazan, the capital of the Republic of Tatarstan, every two years becomes the center of attraction for all of the aviation industry of the Russian Federation, and holds one of the largest exhibitions devoted to aerospace technology in Russia: Aerospace Technologies, Modern Materials and Equipment - ACP.

An international specialized exhibition Aerospace Technologies, Modern Materials and Equipment - ACP was held in Kazan in for the first time in 2002. The exhibition brought together about 70 companies from Russia, Ukraine, Belarus, and was visited by more than 6000 people. Every year the geography of exhibitors has expanded, so during different time periods the exhibition has been attended by representatives from Germany, France, Switzerland, Kazakhstan, Lithuania, Syria and the USA. Various research institutes, design bureaus, enterprises and companies from Russia and foreign countries have taken the opportunity to demonstrate their achievements. In 2014, the exhibition was attended by about 100 companies from 16 Russian cities: Moscow, Saint Petersburg, Almetyevsk, Armavir, Dubna, Ekaterinburg, Chrysostom, Izhevsk, Irkutsk, Kazan, Karachev, Kirovo-Chepetsk,
Lipetsk, Perm, Samara, Tomsk. Companies included the Rostec Corporation, United Aircraft Corporation, Oboronprom Corporation, and large research centers such as Central Institute of Aviation Motor Development, the All-Russian Scientific Research Institute of Aviation Materials, the Central Aero-hydrodynamic Institute and many others participated in and visited the exhibition. Companies representing the products of 11 countries have also participated in ACP: Belgium, France, Germany, Israel, Italy, Norway, Belarus, USA, France, Switzerland and Sweden. In 2014 the exhibition was visited by a delegation from the China Aerospace Science and Industry Corporation (CASIC) and Aerosun Corporation [1].

Traditionally, the international scientific-practical conference on aerospace technologies is held within the framework of the business program of ATC. The Conference is organized in sections: "Aircraft Engineering", "Design, Engineering and Production", "Engines and Power Plants", "Avionics, Equipment and Control systems," "Radio-technical Systems and Aircraft Complexes", "Information Technologies in the Aerospace Industry", "Financial and Economic Aspects of Development of Aerospace Complex of Russia and the Republic of Tatarstan" and "Training of Personnel for the Aerospace Industry". Usually, the participants of the conference are the heads of leading research centers, scientific and technical complexes, scientists and specialists of higher educational institutions, research institutes, design organizations, aerospace centers of Russia and other countries. The President of United Aircraft Corporation, the Director of Helicopters of Russia, the Director of the Central Aero-hydrodynamic Institute and many others have made plenary reports in the framework of the conference.

Modern technologies in the aviation and space industries, and innovations in aviation that are presented at exhibitions like ACP are the results of the work of highly skilled engineers and personnel, so the question of training of high-quality personnel for high-tech enterprises is a key question for discussion at such exhibitions and conferences. In this context, it is obvious that for many years the ACP conference is an effective communication platform for professional discussions of the main issues of aviation engineering education in Russian aviation universities.

At the conference, the questions of modern requirements for training workers for the aerospace industry, and new educational technologies are the main issues of plenary and section reports. Within the framework of the conference, meetings of heads of enterprises of the aerospace industry, rectors and vice-rectors of universities, heads of personnel services of enterprises, and experts in the field of education are held to discuss new methods, innovative educational training and retraining technologies. Questions as to what competencies should graduates possess and how to develop those competencies are discussed during the round tables meetings.

During the conferences, a very wide range of issues pertaining to personnel training for the aerospace industry was discussed, so let’s note the most interesting questions and reports that were made within the last two ACP conferences.

Today in Russia the system of higher education allows for single-level training graduates (duration 5 and 5.5 years) and also for a two-level education system with the assignment of graduate Bachelor's degree (4-year training) and master's degree (duration 1-2 years) after receiving a bachelor's degree or professional qualification. Every year, the two-
level training system is expanding within the higher education institutions in Russia, including universities which train engineers for the aerospace industry. However, the appropriateness of the two-level system of training for aerospace engineering personnel, is the topic that is causing a lot of disputes. The weak point of the two-level education system and its implementation in the training of specialists for the aerospace industry, is the lack of clear advantages in comparison to the pre-existing system of education. This theme is the most discussed topic during the round-table sections of the conference.

The implementation of distance learning in the field of training for aerospace industry is also very controversial and an interesting topic for discussion. The modern stage of development of engineering is characterized by the increased demands for mobile professional specialists who are able to realize themselves in the constantly changing environment, so the application of distance learning for training and retraining, obviously, would be a tool for solving problems of this kind. However, the effectiveness of distance learning technologies in the narrow technical practice-oriented disciplines remains the big question. For example, in [2], the role of distance learning in modern engineering education is considered, including techniques of distance laboratory practice, as well as an analysis of the effectiveness of distance laboratory work. The advantages of distance learning are mentioned: "The role of distance education is constantly increasing due to the development of information and telecommunication technologies. The advantages of this form of training are ease of access to the educational material, the opportunity to study at a convenient time and regardless of where they live, availability for all persons, regardless of employment at work, health and so on."

Also the factors that can prevent the spreading of distance education technologies were noted. "The limitations of the introduction of distance learning in engineering specializations are outdated teaching techniques and instruments". In the paper it was pointed out that the distance learning technologies should be used in teaching technical disciplines only in conjunction with the complex of classroom laboratory works involving the teacher. "The present level of development of information technologies has opened up wide perspectives and opportunities for the study of phenomena that occur in the technical devices and systems. These phenomena can be modeled in different computing environments or studied by the actual devices and systems using the appropriate hardware and software. A rational combination of traditional laboratory works and distance technologies is a priority for improvement of engineering education."

In [3], a monitoring system which is necessary to control, estimate the quality of, and value the correctness of the student’s distance laboratory practice in technical disciplines, is presented. "The system enables you to record statistics and the timing of each student, as well as to make the quality analysis of the implementation of the practical detailing in chronological order of the experiment sequence, set of input data and value their correctness."

In [4], the questions of integration of the educational information system for training and retraining of engineers are discussed. The authors recommend "the widespread introduction of digital educational services for all education institutions to train qualified specialists in the field of engineering and to ensure the effective use of available resources of
educational institutions and enterprises seems appropriate use of the modular data center". In the paper it is noted that "in the framework of this approach, a real integration of education, research and production information environments of universities and enterprise, its subsequent advanced development for the real competitiveness of the industry can be implemented. A network of data centers should provide information and logistical cooperation of all subjects of the education system. An important feature of data centers is providing all activities in the field of training and retraining: educational work, management, extracurricular activities, control".

Modernization of professional education is one of the priority directions of development of Russian education. According to the President of the United Aircraft Corporation Yury Slyusar: "For the successful development of the aircraft industry today it is necessary to introduce modern educational standards and to train professional staff in this way, so that young professionals are to be ready for work immediately after the end of education". For an effective functioning of the system of personnel training for the aerospace industry it is necessary to provide integrity to the systems of science, education and industry, and to develop the concept of continuing professional education and the concept of practice-oriented learning technologies. The organization of resource centers that include several educational institutions that will have the opportunity to exchange among institutions material, technical, educational and human resources intended for the development of modern professional technology is an obvious requirement [5]. Also, the questions of the implementation of a dual training system is considered, the scientific reasoning, testing, and then the introduction, the development of dual forms of training in college and distribution in the system of professional education are mentioned.

A part of the section reports the issues of special contract training, as well as issues of additional retraining were noticed [6].

In [7], cooperation with the European aerospace clusters, training, issues of innovative educational technologies of the world's top universities, as well as perspective directions of international scientific and technological co-operation are studied. The issues of realization of joint international training programs in the aerospace industry, the development and implementation of competence centers in the field of training for the aerospace industry, the development and implementation of joint educational programs in the field of aviation are considered. It was noted that the priority is to "create a union of highly qualified engineers, who are well practiced in foreign languages, are able to navigate in the stream of the global information network, and are able to find new modern technological solutions and achievements in the field of their professional interests".

International cooperation in the field of training highly qualified engineering personnel for the aviation industry, in our view, is today one of the most perspective areas of cooperation between Russia and China. Today Russia and China are constantly increasing the rate of cooperation and expanding the area of interaction. Thus, at the last meeting of the leaders of two countries, Vladimir Putin and Xi Jinping signed nearly 30 agreements in the fields of energy, aviation, space, and finance. In the joint statement of Russia and China, it states that the two countries are planning to increase investment in the field of transport, energy and infrastructure. In addition, Russia and China plan to join forces to develop a rocket
engine and electronic components in the field of satellite navigation, exploring deep space. Moscow and Beijing will continue to cooperate in the field of civil aviation. In particular, the creation of wide-body long-haul aircraft and heavy helicopters was discussed. Also, the Chinese and Russian sides continue successful cooperation in the field of high technologies. It is clear that successful implementation of these agreements is not possible without the joint training of engineers; discussions, exchanges of information, views, intensification of academic exchange programs, etc. In this regard, the ATC conference may be a great opportunity for the joint discussion of Russian and Chinese issues of engineering education in the aerospace industry.

At the 2016 ATC conference, events such as the Congress of Rectors of Russian Aviation Universities, a qualifying round of the “World Skills Russia” championship, "Aviation Maintenance” and Junior skills competency "Aerospace Engineering"[1] will be held. These events are to be considered as a big step forward in the improvement of the quality of training for aviation industry and aim to encourage experts in the field of aviation education from different countries, including China, to participate in ATC.

REFERENCES


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