

ABOUT OPPORTUNITY AND ADVANTAGES OF ADAPTATION THE SYSTEM OF EDUCATION OF EXPERTS ON ATOMIC ENGINEERING SPECIALTY IN ODESSA POLYTECHNIC UNIVERSITY TO THE EUROPEAN SYSTEM OF EDUCATION

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Abstract. Education of experts for atomic engineering in Odessa Polytechnic University is conducted for almost thirty years and has developed traditions. Approaching of education systems of experts of Ukraine and Europe inevitably in the modern integrated world including nuclear engineering. Thus it is necessary to take into account experience of progressive World and European countries and Eastern Europe countries – Russia and Ukraine. Creation of All-European Methodical Center for coordination of education of experts for Nuclear industry with the main functions - coordinating, supervising and consulting is expedient.

1. Introduction

Education of qualified personnel for atomic engineering – the priority demand for further stable, reliable and safe work of its objects.

There are four Nuclear Power Plants that are working in Ukraine: including the largest in Europe Zaporozhye atomic Power Plant with capacity 6 million kW. The power unit with capacity 1 million kW at the Khmelnytskyi atomic Power Plant entered into operation in August this year and the same block at the Rovno atomic Power Plant is planned to be start-up in the nearest future. Development of atomic engineering as the major component of Ukraine's power production demands corresponded personnel education of experts on various specialities.

2. Education of experts for Nuclear Power Plants in ONPU

Education of experts for Nuclear Power Plants in Odessa National Polytechnic University (ONPU) is conducted since 1977. At that period of time our University was the only one high educational institution in Ukraine, which was entrusted to conduct the education of mentioned experts for nuclear power branch that intensively developed in the former USSR.

The founders of the Ukrainian school of education of engineering staff for nuclear branch of industry were such well known scientists as D.P.Gohshtejn, I.V.Pasechnik, K.V.Olesevich. Their influence on the formation of methodical, scientific and organizational bases of education of experts for new at that moment direction is felt now thus the basis principles of education of engineers have been taken so as it was developed in Soviet Union.

3. Features of education of experts for Nuclear Power Plants in the countries of the former USSR

Merits and demerits of these principles are well known. On the one hand – relative isolability of education of the technical engineering staff from the world experience, difficulties in exchange of the scientific and educational information, less of budget capabilities for creation laboratory and experimental base in education on world level, the reinforced centralization of education system that limiting the initiative of educational institutions, etc.

3.1. A full set of specialities

But on the other hand – the isolability has led to necessity of development of own full cycle of nuclear power production and, accordingly, development of scientific schools and professional trainings for all directions: from nuclear-physicists experts up to the repair and operational personnel. As about ONPU – education there is conducted practically on all

specialities that necessary for nuclear power energetic. They are experts on designing and operation of the Atomic Power Plants, experts on technology of water and fuel, experts on automation of technological processes and programs for control systems, experts on physics of nucleus and elementary particles, experts on ecological safety of power manufactures, etc. Such wide set of directions of education level allowed to create within the framework the Power Institute of ONPU. Power Institute becomes the modern scientific and pedagogical school. In each Department works 3 – 4 Doctors of Science and 24 Doctors of Science, Professors totally in Energetic Institute.

3.2. Uniform curriculums

The Soviet reinforced centralized education system with uniform curriculums since elementary school and up to the full high education in corresponding specialities, as it was already marked, held down the initiative of the educational institutions, separate professors and teachers, however, undoubtedly, promoted conditions for creation unified but at the same time logical and consecutive system of preparation of the highly skilled staff.

Particular specialty curricula with unique set of disciplines for all high schools of the country, rigid but logical sequence of training, that excluded the opportunity of transition to the following grade level without deep studying of all providing disciplines, allowed to organize a professional training for new branches in short terms and with minimal expenses [1]. It is difficult to imagine how it is possible to study the processes in the basic and auxiliary equipment of the Nuclear Power Plant without deep knowledges in the courses of technical thermodynamics, hydraulic and gas dynamics. In these conditions the role of Nation-Wide Methodical Advices on corresponding specialities was very great, really most talented and outstanding experts were involved in work in which scientists, professors from all over the country. The necessary updates caused by necessity of the account varying external conditions, new technologies and opportunities were discussed at methodical meetings of Heads of Departments on corresponding specialities from all regions of the Union. Methodical meetings were regular and took place in various educational institutions periodically in some years

3.3. The advanced system of practical education

Deficiency of capabilities for development of laboratory equipment of Universities and Institutes was compensated by obligatory passage of an industrial practice practically on all curriculums at the most interesting plants of the modern power complexes. After the first grade – introductions practice at the nearest to an educational institution power enterprise. After the second-third grades – technological practice at the largest and modest factories of turbines manufacture, reactors, steam and gas generators, etc. After the fourth rate – an industrial practice at the large Nuclear Power Plant where theoretical knowledges were replenished with data about operation modes of the basic and auxiliary equipment in real conditions of exploitation. And on the fifth grade, during preparation of the master's degree project – predegree practice in the Research Institutes, in the Test and Adjusting organizations of Power Plants. Thus the teachers from various educational institutions who head student's practice were financed from the state budget. The most qualified experts of the corresponding enterprises were paid additionally about 20 % their salary for performance such prestigious work as practice of students.

Very frequently at the enterprises the conditions and for continuation of mastering of a theoretical material with attraction for teaching work of experts of power stations, carrying out of laboratory works under programs of industrial tests of the real equipment were created. The analysis of curricula of power specialties shows, that at that time duration of stay of students at the enterprises of power branch was about 10 % of all study hours.

Confirmation of high efficiency of an education system developed in the Soviet Union, despite of the lacks marked above, are the world level achievements, and even leading positions that time in astronautics, aircraft, power mechanical engineering, in the field of physics and other high technology directions.

4. The major conditions of transition to uniform European system of professional training

Naturally, in modern conditions of opened and at the same time united to the largest economic, political Unions of the world, the most effective organization principles of education in the various countries of Europe including the countries of former Soviet Union, can and must be claimed especially in high education system for nuclear industry.

The adaptation of developed education system in Ukraine and in Odessa National Polytechnic University, particularly, is necessary and useful direction of movement to unification of European education. However it is very important to keep most positive features and traditions of professional training systems of various countries such as features of student's contingent, financial abilities of the state to support the education, features of personnel selection by manufactures of various branches of industry, including their opportunities for active participation in process of preparation of experts.

Transition to two-level system of technical higher education – the bachelor and the master, instead of classical for the former Union of one-stage system – the engineer or developed now in Ukraine three-stage – the bachelor, the specialist and the master is natural step in unification of the European education [2]. However since 4 years period of nuclear power education of the bachelor with his corresponding level is insufficient the bulk of graduates, which will work at the atomic power plant, should have a master degree level of education. Reception of the first scientific degree – the master is very important, thus the level of special education and quality of practical education of graduates has not be lowered especially for nuclear power branch industry.

5. The conclusion

For preservation of positive achievements of systems of education of nuclear-experts in the various countries of the European Union, and also in the countries of the East Europe – Russia and Ukraine, the further perfection of education in conditions of its unification within the framework of Europe, creation of the all-European Methodical Center for coordination of education of experts for nuclear industry with the main functions: coordinating, supervising and consulting functions is very expedient.

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