SPECIFICITY OF EDUCATIONAL PROGRAM ON SPECIALTY "THERMAL POWER ENGINEERING"

1. Goals and objectives of the educational program

The main objective of the doctoral educational program "Renewable Energy" in the specialty 6D071700 - "Thermal Power Engineering" is the formation of the personal qualities of the graduate, as well as general cultural and professional competencies, allowing to carry out professional activities related to the development of theoretical foundations, methods and technical means of converting renewable energy sources, and also, in accordance with the requirements of employers and based on the needs of the labor market.

The main tasks of the doctoral educational program:

- to provide an individual educational trajectory of study in accordance with the specialization chosen by doctoral students;
- to provide a full-fledged and high-quality scientific and pedagogical education, to form professional competence, to deepen theoretical and practical, as well as individual training of doctoral students in the field of energy.
- to promote the obtaining of the most important and sustainable knowledge by doctoral students, ensuring a holistic perception of the world;
- to develop the ability of students to self-improvement and mastering new knowledge;
- prepare specialists with a high level of professional culture (including a culture of professional communication) with a civil position, able to formulate and solve modern scientific and practical problems, teach in universities, successfully carry out research and management activities;
- to ensure the development of professional mobility guaranteeing fundamental courses at the intersection of sciences;
- to ensure the receipt of the required amount of knowledge in the field of university pedagogy and psychology and the acquisition of teaching experience in the university.

The ultimate goal of the program is to prepare, on the basis of the consolidation of scientific and educational resources of the university, competitive energy specialists who are able to participate in the implementation of a technological breakthrough in the economy of the Republic of Kazakhstan.

2 General characteristics of the educational program.

Currently, the training of specialists capable of performing research, teaching and practical work, representing a combination of means, methods and methods of human activity related to the development of theoretical foundations, methods and technical means for converting renewable energy sources, is very relevant. At the same time, it is very important to prepare modern highly qualified scientific and pedagogical personnel for the implementation of professional activities, in accordance with the requirements of employers and based on the needs of the labor market. The uniqueness of the educational program lies in the fact that this activity is associated with high risks associated with the operation of

equipment with high parameters of the working environment (temperature, pressure) and large-sized facilities.

Due to the fact that in Kazakhstan 85% of electricity is generated at coal-fired thermal power plants, today in order to improve the environmental situation in the world, there is an urgent need to increase the proportion of energy generated by renewable energy sources. In this regard, the need for training in this educational program will be constantly relevant.

The modular educational program is developed in accordance with the National Qualifications Framework and is aligned with the Dublin descriptors and the European Qualifications Framework. The educational program is designed on the basis of a modular system for the study of disciplines and contains 5 modules that form common cultural and professional competencies.

The modular educational program involves the study of the following cycles:

- theoretical training in the cycles of basic and major disciplines;
- additional types of training: pedagogical, research practice;
- doctoral student research work, including the implementation of a doctoral dissertation;

Final state certification in the form of passing the state exam in the specialty and preparation and protection of the graduate work of a doctoral candidate.

The standard term for the development of a modular educational program for the scientific and pedagogical field of study is 3 years.

The complexity of mastering a modular educational program for doctoral students specified in the credits for the entire period of study in accordance with the SES RK, including all types of student work and practice, and the time taken for full-time quality control is 180 credits, including: 53 credits for studying academic disciplines, 115 credits for all types of practices (Research practice - 6 credits, teaching practice - 9, doing a doctoral dissertation - 60 credits) and research works Doctoral students (40 credits), 12 credits for final attestation (comprehensive exam - 2 credits, writing and defense of final work - 10 credits).

3 Qualification characteristic

• Sphere of professional activity:

The sphere of professional activity of the graduate is energy as an integral part of technology, which includes a set of tools, methods and methods of human activity associated with the development of theoretical foundations, methods and technical means of converting renewable energy sources. The objects of professional activity of a doctoral student are power plants, power plants and complexes based on non-traditional and renewable energy sources, as well as the power supply systems of rural settlements of agricultural enterprises, transport systems and their facilities.

Graduate's field of activity is a branch of activity that is related to the use of renewable energy sources for the production, supply, transportation, storage, transmission and consumption of energy generated from renewable sources.

The objects of the professional activity of the doctoral student are:

- power plants, power plants and complexes based on alternative and renewable energy sources, as well as the power supply systems of rural settlements of agricultural enterprises, transport systems and their facilities;

- power plants, power plants and complexes based on renewable energy sources.

- Autonomous power complexes as part of a photovoltaic plant with different power with a monitoring system, accumulation and backup power supply;

- heat supply systems with heat pump;

- heliosystems with thermal collectors;

- installation of a wind turbine with a horizontal and vertical axis of rotation;

- mini-hydro and micro-hydro;

• Types of professional activity:

4 Kinds of professional activity of the graduate are:

- scientific research;

- pedagogical;

- operational research;

- production and technology;

- construction;

- organizational - managerial;

- design.

A doctoral student enrolled in this educational program may in the future work at the facilities of enterprises such as:

- thermal power plants (TPP), these are combined heat and power plants (CHP), condensing power plants (CPP), nuclear power plants (NPP);

- industrial and heating boilers;

- production and distribution of energy carriers, etc. (by example: CHP-1, CHP-2, Astana, Astana-Teplotransit JSC, AstanaEnergoService JSC, etc.);

- research institutes;

- educational universities;

- colleges.

And also, at any production facilities and enterprises where there is renewable energy equipment.