Program: Nuclear Power Engineering and Thermal Physics (Training program «Mounting, set-up and repair of NPP equipment») (14.03.01)

Training Area: Technical sciences

Duration: 4 years

Program supervisor: Associate Professor Alexander V. Nakhabov, Candidate of Technical Sciences

Basic department: Department of Nuclear Physics and Engineering (Obninsk).

Goals of the Program

In the field of education, the purpose of the program is to prepare highly qualified specialists in the field of nuclear power engineering and nuclear technologies capable of carrying out fundamental and applied research on improving nuclear technologies and the development of innovative technologies, systems and installations for transformation of nuclear energy specializing in the area:
• development and practical implementation of NPP equipment mounting technologies at the construction and modernization phases;
• organizing and conducting commissioning works before putting the NPP power unit into operation;
• development and practical application of technologies and methods of repair of equipment of NPPs of Russian design at all stages of their life cycle.
As well as the purpose of the program is to form the social and personal qualities of graduates: the purposefulness, organization, hard work, sociability, the ability to work in the team, responsibility for the final result of their professional activities, civil liability, tolerance; Increasing their common culture, education and evaluation, the ability to independently acquire and apply new knowledge and skills.

Characteristics of the scope and objects of professional activity of future graduates: the main requirements of graduate consumers implemented in the design of the program: in-depth knowledge in the field of strength of materials, strength calculations and related disciplines, knowledge and ability to work in modern CAD systems, internships at specialized enterprises.

Objects of the professional activity: thermal and thermal hydraulic processes occurring in equipment for the generation, conversion and use of thermal and nuclear energy, structural elements of devices, apparatus and installations that are developed, created and used in various fields of new technologies. Nuclear power plants, fusion reactors and other nuclear, thermal physical power plants as objects of human activity related to their development, creation and operation.

Brief description of the curriculum

In the curriculum, mathematical disciplines (mathematical analysis, analytical geometry, linear algebra, etc.) take up 36 ECTS credits (15%). Natural sciences account for 29.2% (70 ECTS) of the total volume of the educational program, the professional component accounts for 58.8% (141 ECTS). Disciplines of the humanitarian and socio-economic block occupy 12.1% (29 ECTS).
The disciplines of the engineering cycle (professional component) account for 141 ECTS credits, of which 27 ECTS are occupied by practical training and defense of the final qualification work. Basically, the disciplines of the engineering cycle are implemented in the 3rd and 4th year of study, practical training (internships) begin after the 2nd year.
In the disciplines of the engineering cycle, the following main scientific and practical areas are considered: engineering graphics and CAD; strength of materials and related disciplines; electrical engineering and electronics; material science; thermal physics and engineering thermodynamics; nuclear physics and dosimetry; welding and non-destructive testing; basics of construction and installation of structures and equipment of nuclear power plants.

Areas of research and experts training:
The main area of the professional activities of graduates is the nuclear industry.
The objects of professional activities of graduates are:

• Thermal and heat-hydraulic processes occurring in installations for developing, converting and using thermal and nuclear energy, elements of the designs of instruments, devices and installations, which are developed, created and used in various fields of new equipment and technology.
• Nuclear power plants, thermonuclear reactors and other nuclear, thermal physical power installations as objects of human activity related to their development, creation and operation.
Types of professional activities:
- Mounting and set-up,
- Research and development,
- Organizational and management.

The base of industrial and/or scientific practice and employment
Most of the graduates of this educational program, as a rule, continue their studies on Master's programs. Foreign students after completing their studies are employed in their country, usually in enterprises of the power engineering and specialized research organizations. The main consumers of Russian graduates are the branch of JSC "NIKIMT - Atomstroy" - Obninsk Engineering Center, operating nuclear power plants (branches of JSC "Concern Rosenergoatom"), branches of JSC "Atomenergoremont", JSC "State Scientific Center of the Russian Federation - Physical and Power Engineering Institute named after A.I. Leipunsky".