Issues of personnel training during the integration of nuclear power plants into the energy system of the Republic of Belarus

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One of the strategic directions in the energy sector of the Republic of Belarus is the construction and commissioning of the first nuclear power plant. A decision was made to implement the AES-2006 project with two third-generation pressurized water reactors (VVER-1200).
Organization of personnel training for the nuclear industry of the Republic of Belarus

- In the Republic of Belarus, 3 universities participate in the training program:
  - Belarusian State University (Nuclear Physics, Nuclear and Radiation Safety)
  - Belarusian State University of Informatics and Radioelectronics (Electronic and information-control systems of physical installations)
  - Belarusian National Technical University (Design and operation of nuclear power plants)
In accordance with the Decree of the President of the Republic of Belarus dated November 12, 2007 No. 565 "On some measures for the construction of a nuclear power plant" and the State Program for Training Personnel for the Nuclear Power Industry of the Republic of Belarus for 2008-2020, approved by the Resolution of the Council of Ministers of the Republic of Belarus dated September 10, 2008. No. 1329 at the department "Thermal Power Plants" in 2008, a new specialty 1-43 01 08 "Design and operation of nuclear power plants" was opened
By Resolution of the Council of Ministers No. 250 dated March 26, 2016, the State Program "Education and Youth Policy" for 2016-2020 was approved and was extended for 2021-2025
The specifics of the work of graduates

Areas of professional activity

- **power generation**
  design, operation and repair of main and auxiliary NPP facilities;

- **education**
  auxiliary support of the educational process in the laboratories of technical universities in special heat and power disciplines, assisting in training sessions;

- **science**
  research and experimental and theoretical substantiation of the scientific foundations for the design and operation of steam turbine installations of nuclear power plants, as well as environmental protection measures and the interaction of nuclear power plants with the environment.
The specifics of the work of graduates

**Objects of professional activity**
nuclear power plants, main and auxiliary thermal and mechanical equipment; thermal power processes and installations; installation, repair and adjustment of equipment of nuclear power plants
The specifics of the work of graduates

Of all the graduates of the specialty 1-43 01 08, more than 50% came to work at the Belarusian NPP and the Department of nuclear and radiation safety of the Ministry for Emergency Situations of the Republic of Belarus.

Four graduates of the specialty "Design and operation of nuclear power plants" work at the energy department of the Belarusian National Technical University.
The main regulatory document in the educational process for the preparation of students is:

Main regulatory documents

Plan of the specialty "Design and operation of nuclear power plants"
Technical literature on nuclear topics
Specialists of domestic and foreign universities and energy enterprises are invited to read special disciplines

- Institute of Atomic Energy, Obninsk, Russia,
- Nizhny Novgorod State Technical University, Nizhny Novgorod, Russia
- Ulyanovsk State University, Ulyanovsk, Russia,
- Sevastopol National University of Nuclear Energy and Industry, Sevastopol, Ukraine - Russia,
- South Ukrainian NPP, Yuzhnoukrainsk, Ukraine,
- Joint Institute for Energy and Nuclear Research – Sosny,
- Belarusian State University,
- International State Ecological University and others.
The laboratories of the Energy Faculty of the Belarusian National Technical University were replenished with modern laboratory stands and installations thanks to funding provided by the State Program for Training Personnel for Nuclear Power Plants.
In the laboratory of steam and gas turbines, two air turbines are installed, as well as laboratory stands:

- "Balancing of power equipment",
- "Fan cooling tower",
- "Study of the hydraulic characteristics of pumping equipment",
- "Study of the characteristics of blow fans"
Laboratory "Thermotechnical measurements and automatic control of heat and power processes"

The laboratory "Thermotechnical measurements and automatic control of thermal power processes" is equipped with modern means of thermotechnical measurements, which are used at thermal and nuclear power plants.
The laboratory "Thermotechnical Measurements and Automatic Control of Thermal Power Processes" also has a stand "Nuclear Technology Materials", which contains modern instruments and means for non-destructive testing of structural materials of nuclear power plant equipment.
The laboratory "Water-chemical complex of thermal power plants and nuclear power plants" is equipped with instruments and tools for chemical analysis and preparation of coolant at thermal power plants and nuclear power plants.
Лаборатория «Парогенераторы и энергетическое оборудование»

The laboratory "Steam generators and power equipment" is equipped with laboratory stands for the study of thermodynamic processes and heat transfer processes.
Laboratory "Mathematical modeling of heat engineering processes"

In the laboratory "Mathematical modeling of heat engineering processes", a specialized training and research laboratory "Turbine department of NPP with VVER-1000" and "Reactor department of NPP with VVER-type reactors" was introduced into the educational process.
This laboratory provides practical training in a range of disciplines of specialties related to the design and operation of nuclear power plants, the control of a turbine unit, the control of a nuclear reactor and their auxiliary systems.
At senior courses, industrial practice and pre-diploma practice are carried out abroad: at nuclear power plants, in training centers and training units of nuclear power plants, in educational universities, research and design institutes.

At the construction site of Novovoronezh NPP-2
Industrial practice and undergraduate practice

At the site of Novovoronezh NPP-1
Industrial practice and undergraduate practice

In the training unit of the Rostov NPP

At the site of the 1st power unit of the Smolensk NPP
Internship at the International Academy of Atomic Energy, training center CETIC (Chalon-sur-Saône, France)

Within the framework of the State Program for the Training of Personnel for NPPs, university teachers visited leading universities in Russia and Ukraine, advanced training courses, and take part in seminars held by the IAEA.
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