

**CAPACITY DEVELOPMENT OF THE  
GLOBAL NUCLEAR SAFETY AND SECURITY  
INSTITUTE IN THE FIELD OF  
NUCLEAR SECURITY**

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**Abstract**

In 1993, the Intersectoral Special Training Center was established to train Russian specialists in the field of physical protection, which was later transformed into the Global Nuclear Safety and Security Institute (GNSSI). In the first years of its existence, the Institute was, first of all, a national training center, carrying out practical training of specialists in the field of various aspects of physical protection. With active cooperation with various competent authorities of the Russian Federation and coordination with them of its activities, the Institute has developed and regularly implements more than 60 training programmes. The institute accumulated the broadest practice and experience in area of establishing, sustaining and further development of human resource capacity for physical protection and security and is willing to share this knowledge with interested IAEA Member-States. In 2004, a joint project on cooperation in the field of nuclear security between the IAEA and the Russian Federation was launched. The goal of the project was to expand and adopt the scope, diversity and improve the quality of training in the field of physical protection, conducted at the Institute in Obninsk for international attendees - specialists from the IAEA Member States. The material and technical base created so far includes 7 training laboratories, 3 computer classes, a modular pedestrian and vehicle checkpoints, 2 training grounds for the physical protection equipment, and other facilities. Training courses include hands-on trainings on direct operation of various physical protection tools and means and are conducted at special training test site and laboratories. Moreover, going beyond hosting and implementing various training events at its place, the Global Nuclear Safety and Security Institute is willing and ready to share its many years of experience in the capacity building in the field of nuclear security to with other educational institutions and national competent authorities.

1. INTRODUCTION

Capacity building for the development, implementation and ensuring the sustainability of the national nuclear security regime and the physical protection of nuclear material and nuclear facilities is a one of the key activities both for States with an advanced nuclear power program, and for those who are just starting to implement a nuclear power or research program. This capacity includes, inter alia, training in the field of nuclear security and physical protection.

In 1993, the Interdepartmental Special Training Center (ISTC) was established to train Russian specialists in the field of physical protection, which was later transformed into the Global Nuclear Safety and Security Institute (GNSSI). In 2017, the Institute became part of the Rosatom Technical Academy.

During the first years of its existence, the Institute was, first of all, a national training center, carrying out practical training of specialists in the field of various aspects of physical protection. Currently, the Institute plays an important role in ensuring the state nuclear security regime in the Russian Federation, performing the following important tasks:

- Interaction with various authorities of the Russian Federation on the training of specialists in the field of physical protection and security of vital state facilities;
- Participation in the development of regulatory documents in the field of physical protection;
- Development and coordination of industry and interdepartmental training programs;
- Organization and conduct of training for Russian trainees;
- Participation in the development and conduct of international training courses;
- Testing and certification of technical means of physical protection;
- Organization of joint events with international organizations and foreign partners in the field of nuclear security;
- Organization of the exchange of best practices in the field of nuclear security.

The structure of the Institute is focused on these tasks and includes 4 training departments in areas related to information security, technical means for information protection, physical protection of nuclear facilities, economic security, asset protection and anti-corruption. In addition, the Institute includes auxiliary units that allow organizing and accompanying the educational process, as well as developing and publishing teaching materials, including presentations, teaching aids, programs for testing trainees and monitoring the quality of education, print and multimedia products. The Institute has a first-class faculty staff, instructors of the Institute have experience of service in the Ministry of Defense and law enforcement agencies of the Russian Federation.

## 2. INVESTMENT PROGRAM

When GNSSI joined the Rosatom Technical Academy in 2017, an investment program was developed, as well as a roadmap for the reorganization of processes for training personnel and the development of Rosatom Technical Academy for the period from 2018 to 2021, including, in particular, the following events:

- Recruitment and training of instructors to support international training activities;
- Development of training facilities;
- Equipping training sites with simulators and technical training facilities;
- Creation of a set of standard training materials for international education;
- Development of computer-based management system for the planning and training of personnel for nuclear power plants being built abroad, as part of the Academy's digital transformation;
- Supplying and accreditation of the industry Center for testing and certification of technical means of physical protection;
- Creation of electronic courses for the industry-wide distance learning system.

Within the framework of the investment program, during 2018, repair and supply of equipment of a separate building intended for the GNSSI with an area of 5,165 m<sup>2</sup> was carried out; in December 2018, the Institute moved to this building. At present, the institute has 11 classrooms, 4 computer labs, 8 educational laboratories, a conference hall with 150 seats, a cafeteria, and a gym. In addition, the Institute includes a training modular pedestrian and transport checkpoints, two outdoor training grounds for engineering and technical means of physical protection, a training complex for the training of security forces, four interactive shooting ranges. In total, the infrastructure of the institute allows to train up to 500 people simultaneously.

Pursuant to the section of the investment program, in 2019 a testing laboratory was created and equipped, on the basis of which it is planned to create an Industry center for testing and certification of technical means of physical protection and to conduct its accreditation. The Center will be responsible for testing and certification of technical means of physical protection in the field of atomic energy use for compliance with the technical regulations of the Customs Union; conformity assessment of technical means of physical protection of foreign manufacturers, examination of relevant technical documentation. The Center is equipped with modern facilities of leading Russian and world manufacturers, which allow testing for external factors (various climatic conditions, dust, vibration, etc.) and electromagnetic compatibility, including the following facilities:

- Test vacuum chamber;
- Test climatic chamber;
- Rain chamber;
- Solar radiation chamber;
- Static and dynamic dust chamber
- Vibration electrodynamic installation;

- Test dust chamber;
- Salt Mist Test Chamber;
- Semi-anechoic shielded chamber;
- Faraday Chamber;
- Harmonic and flicker analysis system;
- Electrostatic Discharge Generator;
- Programmable power supply, test generators, RF power amplifiers and other equipment.

### 3. GNSSI TRAINING PROGRAMS

Extensive training capabilities of the GNSSI allow training on a wide range of training programs in the field of physical protection of nuclear and other radioactive material and related facilities, ensuring information security in the nuclear industry, economic security and other fields. Using active interaction with various authorities of the Russian Federation and coordination with them of activities in training specialists in the field of physical protection and security of vital state facilities, the Institute has developed and regularly implements more than 60 training programs, of which 28 are in the field of physical protection of nuclear material and nuclear facilities. The greatest demand is for training programs on the following topics:

- Physical protection of nuclear facilities;
- Vulnerability analysis of nuclear facilities;
- Industry and facility control of the physical protection of nuclear facilities;
- Implementation and operation of complexes of engineering and technical means of physical protection;
- Fundamentals of physical protection of radiation sources, storage facilities for radioactive substances;
- Management of a complex of engineering and technical means of physical protection from alarm stations;
- Assessment of the effectiveness of physical protection systems;
- Information Security.

From 1,500 to 2,500 Russian specialists in the field of nuclear security are trained at the Institute annually. Organizations of the nuclear industry, state and municipal institutions, state competent authorities (Federal National Guard Troops Service, Ministry of Internal Affairs, Federal Service for Environmental, Technological, and Nuclear Supervision), other Russian authorities and organizations send their representatives to study at the Global Nuclear Safety and Security Institute. More than 50% of trainees are employees of organizations and institutions of Rosatom State Atomic Energy Corporation.

Among the trained specialists are senior managers, personnel of the security departments and response forces, specialists in the implementation, operation and maintenance of engineering and technical means of physical protection, specialists in the industry and facility control, personnel responsible for the transportation of nuclear and other radioactive material, and information and computer security, pass office staff.

Training programs and training materials are based on a systematic approach to training, the requirements of the Convention on the Physical Protection of Nuclear Material and its Amendment, the IAEA publications on nuclear security, the Russian regulatory framework and the vast experience of Rosatom State Atomic Energy Corporation in this area. The duration of training is usually from 2 days (managers) to 12 days (specialists).

Much attention is paid to assessing the quality and effectiveness of training. In 2018, Rosatom Technical Academy passed certification according to the quality management system ISO 9001:2015 in the field of information, consulting and educational services in the nuclear industry. An assessment of each training course and overall satisfaction of customers with the level of training at the Academy is carried out. To assess the quality and effectiveness, questionnaires, filled out by trainees and customer organizations, analysis of the results of tests and exams, direct monitoring of training are used, a survey of customers by a third-party company is carried out.

#### 4. COLLABORATION WITH THE IAEA

Initially focused on an internal Russian audience, the Institute has accumulated many years of experience and competencies in the field of training, maintaining and developing the qualifications of specialists in the field of physical protection and security. and is ready to share its experience with interested IAEA Member States. In this regard, the institute developed contacts with the IAEA, which plays a central role in international cooperation and provides technical assistance to Member States upon their request in building national nuclear security systems and measures, as well as with other international and foreign organizations. In recent years, special attention has been paid to the development of international cooperation.

In 2004, a joint nuclear security cooperation project between the IAEA and the Russian Federation was launched. The aim of the project was to expand the Institute's available scope, diversity and improve the quality of training in the field of physical protection held at the Institute in Obninsk for foreign trainees from the IAEA Member States. With the support of the IAEA, a new outdoor training ground for engineering and technical means of physical protection was created, integrated with the central alarm station; the training ground and laboratories were equipped with modern physical protection equipment. In 2018-2019, together with the IAEA, a training ground modernization project was implemented. In 2020-2022, further cooperation with the IAEA on the modernization of the training ground is expected to provide the most complete representation of the contemporary engineering and technical means of physical protection produced by the world leading manufacturers and based on various operating principles. New capacities of training grounds and laboratories will allow to expand the topical areas and enhance the practical orientation of the international and regional IAEA training courses, as well as technical visits and internships of the IAEA Member States conducted in the GNSSI.

It is important that the Institute presents the widest range of engineering and technical means of physical protection, and training is designed in such a way as to explain to students the various principles of the construction and functioning of systems. This approach allows us not to impose any particular scheme for ensuring nuclear security, including physical protection, or for the equipment manufacturer. Trainees and participants of training events from Member States can independently determine the merits of technical equipment of a different operating principles, the features of their use depending on specific operating conditions, and decide which of the presented equipment is suitable specifically for their state in general and facility in particular.

From 5 to 10 international and regional IAEA courses and seminars are held annually at the Institute; since 2004 more than 1,100 participants from 67 countries have been trained. These international and regional events have been developed and aimed at a wide and diverse audience: the senior managers of government bodies and nuclear facilities, state regulatory bodies in the field of security, nuclear security experts and university students. Many of these training events include practical exercises on direct work with various means and measures of physical protection at a special training ground and in the training laboratories having a set of technical means of physical protection (central alarm station, access control systems, CCTV systems, modular checkpoints).

#### 5. CONCLUSION

Taking into account the vast experience and accumulated potential of Rosatom Technical Academy in the field of professional training, on September 19, 2019, during the 63<sup>rd</sup> session of the General Conference of the IAEA, a ceremonial signing of the agreement on designation of the Rosatom Technical Academy as the IAEA Collaborating Centre was held. The area of collaboration is the knowledge management and human resources development for nuclear energy and nuclear security. The agreement was signed on the part of the Technical Academy by rector Yuri Nikolayevich Seleznev, on the part of the IAEA by the Deputy Directors General Juan Carlos Lentijo and Mikhail Valentinovich Chudakov.

In addition to conducting various training events at its base, the Institute for Global Nuclear Safety and Security is ready to share its many years of experience in developing nuclear security capacities with other educational institutions and national competent authorities, including through active participation in the activities of the international network of Nuclear Security Support Centers (NSSC) and the International Nuclear Security Education Network (INSEN), the creation of an international school of instructors in the field of physical protection, the participation of representatives of the institute in various IAEA human resource development activities and the development of teaching materials for training courses as experts and teachers.