

ASSISTANCE IN THE DEVELOPMENT OF THE NUCLEAR SECURITY INFRASTRUCTURE IN NEWCOMER COUNTRIES

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Abstract

Being responsible vendor of nuclear material and nuclear technologies for a number of new overseas nuclear facilities, including nuclear power plants and Nuclear science and technology centers, we recognize importance of establishing sustainable national nuclear security regimes in the Member States. Assistance to States in establishing and maintaining of highly professional, qualified and experienced human resources is one of our priorities. Since 2017, Russian Federation has been providing on annual basis voluntary contributions, in kind and funding, for implementation of TC projects related to nuclear infrastructure establishment. These funds, according to the IAEA-Russian Federation agreement, are being used for training and development of human resources in States that are constructing or planning to construct NPPs. Based on our experience of cooperation with some countries, specialists of Rosatom Technical Academy participated in the development of a model of the nuclear infrastructure of a newcomer country, including in the field of nuclear security. The model is a description of the target status of the State's nuclear security regime and approaches to the development of a legal and regulatory framework, the creation of technical and human resources with development over time. Based on the educational and training needs analysis of newcomer countries for the development of staff competencies of various government authorities and organizations with nuclear security functions, Rosatom Technical Academy developed and conducts a number of training courses on nuclear security issues that may be included in the roadmap activities.

1. INTRODUCTION

As a responsible supplier of nuclear material and technologies for a number of new overseas facilities in the area of the atomic energy use, including nuclear power plants and Nuclear science and technology centers, we recognize the importance of establishing sustainable national nuclear security regimes in States. The development of nuclear infrastructure in States embarking on the implementation of a nuclear power or research program is complicated with objective difficulties. Providing assistance to Member States in the development and maintenance of highly professional, qualified and experienced personnel is one of Russian Federation priorities.

The IAEA is a professional and technical organization that plays a central role in the international cooperation and provides Member States, upon request, with technical assistance in building their national nuclear security systems and measures. In this regard, starting from 2017, the Russian Federation annually makes voluntary contributions, in kind and funding, for the implementation of projects under the IAEA's technical cooperation program for the development of nuclear power infrastructure. These funds, according to an agreement between the Russian Federation and the IAEA, are used for training and human resource development in States constructing or planning to build nuclear power plants.

Direct bilateral assistance is also being provided to our partners in the development of their national nuclear infrastructure. Examples of such bilateral collaboration are assistance in the framework of the implementation of projects for the construction of nuclear power plants according to Russian technologies and the creation of Nuclear science and technology centers. Often, it is such a two-way interaction that is considered more productive, since the issues of building physical protection systems usually involve the exchange of confidential information.

In the framework of such assistance on the basis of requests from the interested States the State Atomic Energy Corporation Rosatom and Rosatom Technical Academy directly provide organizational and methodological support in the development of all 19 elements of the national nuclear infrastructure in the States embarking on the implementation of a nuclear power or research program, as well as developing existing programs, including areas of nuclear security.

2. ASSISTANCE IN THE HUMAN RESOURCE DEVELOPMENT

In the State that creates or develops nuclear security infrastructure, various state authorities and organizations with nuclear security functions operate or are being created, between which clear coordination mechanisms should be established and their strategic and current tasks and work plans should be determined, taking into account IAEA recommendations and approaches.

Based on the experience of cooperation with newcomer countries, for example, Bolivia, Zambia, the CIS countries and other countries, specialists of the Rosatom Technical Academy took part in the development of a model of the nuclear infrastructure of a newcomer country, including in the field of nuclear security. The purpose of the model is to assist decision makers at the national level in planning and implementing a national nuclear power program or a national nuclear research program, including the creation and development of an effective nuclear security regime, especially at the initial stage of its development. The model is a description of the target status of the State's nuclear security regime, which should ensure the safe and secure creation and development of a national nuclear power program in the country. In particular, the model presents approaches to the development of a legal and regulatory framework, the creation of technical and human resources with development over time.

Taking into account results of educational and training needs analysis of these States for the development of staff competencies of various government authorities and organizations with nuclear security functions, Rosatom Technical Academy has developed and is conducting a number of training courses on nuclear security issues which can be included in the roadmap activities, for example, on the development of a regulatory framework, the design, operation and inspection of physical protection systems for nuclear and other radioactive material and associated facilities.

Cooperation in the field of nuclear infrastructure development may take the following forms:

- Consulting: missions of Russian experts, seminars with representatives of organizations of the recipient State with the nuclear security functions;
- Training: basic and special training courses, internships, workshops;
- Assistance in the establishment of Nuclear Security Support Centers;
- Assistance in developing programs and teaching materials for training courses;
- Training of instructors;
- Scientific and technical visits to Russian organizations and institutions.

The first States, with which cooperation in the development of nuclear security infrastructure began, were the CIS States. Starting from 2009, the following programs and courses were developed and conducted for them:

- Implementation of a systematic approach to training for a Training center for accounting, control and physical protection of nuclear materials of the Joint Institute for Power and Nuclear Research – Sosny of the Republic of Belarus, 2009-2012.
- Development of training programs and teaching materials and the introduction of training courses on accounting, control and physical protection for the Training Center of the Institute for Nuclear Physics of the Republic of Kazakhstan, 2010 - 2014.
- Conducting training courses for instructors in the field of accounting, control and physical protection of nuclear material “Basic training of instructors. A systematic approach to training. Fundamentals of instructor skills” and “Development of curricula and training materials”, 2008-2015.
- Development and implementation of a pilot course on practical training of instructors in the field of accounting, control and physical protection of nuclear material, 2015.

3. COLLABORATION WITH THE IAEA

An additional impetus to cooperation with States embarking on the development of nuclear power and nuclear technologies was provided by the signing in 2011 of the Practical Agreements between the IAEA, the Central Institute for Continuous Education and Training (CICE&T, which later became part of the Rosatom Technical Academy) and Rosenergoatom Concern OJSC on cooperation in the development of joint initiatives in the field of training for the development of nuclear infrastructure and capacity building in countries embarking on the development of nuclear power programs.

In 2018, Practical Arrangements were signed between the IAEA, the Rosatom Technical Academy and the Federal State Unitary Enterprise "Emergency and Technical Center of Rosatom" for capacity building in the field of nuclear safety, radiation protection and emergency preparedness and response.

4. INTERNATIONAL TRAINING COURSE ON THE ESTABLISHMENT OF THE NUCLEAR SECURITY REGIME

Since 2016, Academy began to actively cooperate with countries embarking on the development of nuclear power, nuclear research and technologies. In 2016, as part of the development of courses on elements of the national nuclear infrastructure, we developed the course "Nuclear Security Systems and Measures for the Implementation of a National Nuclear Power Programme". For this course, the source materials were determined, the concept of the course was developed and approved, the target audience was determined. The developed course program included lectures, interactive exercises, practical exercises, visits to nuclear facilities. Then, teaching materials in Russian and English were developed: a training manual, presentations, materials for instructors, questionnaires and tests to assess the quality of training; these materials were reviewed and approved by experts from Rosatom State Corporation.

In the same year, the course materials were accepted by the IAEA as the basis for training in the framework of the Agency's international course, the new name of the course in the catalog of the IAEA training courses is "Establishment of Nuclear Security Regime for Nuclear Power Programmes". This course is held annually, starting in 2016, in Obninsk and St. Petersburg. Target audience - top and middle managers representing organizations responsible for creating nuclear power programs in their countries. In 2018, the course materials were revised by the IAEA. The main topics of the course:

- International instruments for nuclear security;
- Legal and regulatory framework for nuclear security;
- Establishing the nuclear security infrastructure for a nuclear power programme (NSS 19);
- Nuclear security recommendations on physical protection of nuclear material and nuclear facilities (NSS 13);
- National threat assessment, development and use of a design basis threat;
- Lifetime stages of nuclear facilities and security aspects;
- Graded approach in physical protection of nuclear facilities;
- Facility characterization and target identification;
- Key functions of the physical protection system;
- Use of nuclear material accounting and control measures for nuclear security;
- Security of nuclear information;
- Computer security;
- Nuclear security measures for the transport of nuclear material;
- Sustaining nuclear security regime;
- Nuclear security culture;
- Development of the security plan for a nuclear facility.

From year to year, the number of States delegating their representatives to participate in this course is growing: in 2016, representatives of 8 countries were trained, in 2017 - representatives of 17 countries, in 2018 - representatives of 14 countries. The last course was held in November 2019, 32 trainees and one observer from 18 Member States took part in it.

5. TRAINING PROGRAMS FOR NEWCOMER STATES

Academy specialists took an active part in a number of international and national workshops organized by the IAEA on the establishment of nuclear infrastructure of States embarking on the development of nuclear power programs, including on human resources development in the field of nuclear security. Professional training programs in the field of nuclear security based on their training needs are being developed for these States. In particular, these programs take into account the following aspects:

- Organizational structure and staffing of enterprises and organizations involved in the development of nuclear power programs, primarily nuclear power plants and Nuclear science and technology centers;
- Qualification requirements for specific job positions;
- Requirements for education and training for specific job positions;
- Possible scope and duration of training.

In 2018-2019, specialists from Bangladesh, Belarus, Bolivia, and the CIS Anti-Terrorism Center underwent training on these programs at the Academy. Based on the requests received, starting in 2020, it is planned to begin systematic training of specialists from nuclear facilities under construction or planned to be built in Egypt, Turkey, Uzbekistan, Zambia.

The main topics of the courses conducted as part of these programs:

- Physical protection of nuclear facilities;
- Physical protection of radiation sources, storage facilities for radioactive substances;
- Design, implementation and operation of engineering and technical means of physical protection of nuclear facilities;
- Sectoral and facility control of physical protection of nuclear facilities;
- Inspection of physical protection systems of nuclear facilities;
- Antiterrorist protection of the facility;
- Implementation and organization of access control systems;
- Information security of automated process control systems.

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 63rd 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.

By definition, the IAEA Collaborating Centre is an organization of an IAEA Member State that, on the basis of a signed agreement, assists the IAEA in the implementation of its program activities by carrying out a certain amount of work in accordance with a Work Plan agreed with the relevant IAEA thematic department(s). The Work Plan is an integral part and is included as an annex to the agreement on the IAEA Collaborating Centre. The Work Plan of collaboration between Rosatom Technical Academy and the IAEA is designed for the period from 2019 to 2023.

In the coming years, a lot of work is planned to implement the Work Plan. In particular, the Plan provides for the review and translation into Russian of training materials of training courses and the IAEA School of Nuclear Security, conducting a series of international and regional training courses, seminars in English and / or Russian, as well as a regional School of Nuclear Security in Russian, participation in the development of new IAEA training courses.

Starting in 2020, it is also planned to develop training materials and conduct training courses for recipient States of the Russian nuclear technologies on the following topics:

- Vulnerability analysis of nuclear facility;
- Assessment of the effectiveness of physical protection systems;
- Organizational measures in the physical protection system;
- Preventive and protective measures against insider threat;
- Information security culture;
- Management of security forces of the facility.

In 2018, the Academy launched the Instructor Training Center for nuclear power plants built by the Russian nuclear technologies abroad. The center trains new generation instructors who know the technological aspects of operating nuclear power plants and speak English. In just two and a half years, it is planned to train about 170 instructors.

Based on the experience of training instructors in the field of accounting, control and physical protection of nuclear material, as well as the experience of the Instructor Training Center for NPP, in 2020 the Academy plans to create an international school of instructors for the physical protection of nuclear and other radioactive material and related facilities. The beginning of the work of such a school can be the IAEA International train-the-trainers course on the physical protection of nuclear material and nuclear facilities, which is scheduled for July 2020 in Obninsk.