

Nuclear security aspect of the new NRNU MEPHI master program for Rostechndzor



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1. Background and Goal of the present work

The possibility of malicious acts involving nuclear or radioactive materials remains a worldwide threat. Ensuring nuclear security (NS) is one of the main responsibilities of an operator of any facility using nuclear / radioactive materials, and should be regulated by the state. Accounting, control and physical protection of nuclear materials and facilities are the subject of regulation. A prerequisite for the implementation of a NS regime is the appointment of competent authorities, among which must be a safety regulatory authority

2. Nuclear Safety&Security Educations programs. National Nuclear Research University "MEPhI" experience.

The master's educational program "Accounting, Control and Physical Protection of Nuclear Materials" was created at NRNU MEPhI in 1997. This was the first systematic training of specialists with higher education in NS in Russia. The program was designed for people with technical education (engineer or a bachelor's degree) in relevant areas. In general, about 200 graduates were trained under this program, (including Kazakhstan, Belarus). In addition, the university has experience in training specialists under the joint program of Rostechndzor and the NRC.

3. Present time development.

In May 2018, an agreement on scientific and technical cooperation was signed between NRNU MEPhI and the Federal Service for Environmental, Technological and Nuclear Supervision of Russia (Rostechndzor). Rostechndzor is the authorized state safety and security regulatory authority in the nuclear area in Russia.

The agreement framework covers a wide range of interactions, including the application of modern digital technologies for knowledge management, improving the methodological basis of educational area, the professional advanced training in the field of nuclear safety and security.

Under this Agreement, a master's program is being developed for training specialists for the Rostechndzor in MEPhI. The wide experience of other educational programs in the field of nuclear security is used in developing this program.

4. General regulation bodies activities.

The area of competence will cover the most fully planned activities of Rostechndzor employees:

Regulation of safety of nuclear power plants and nuclear research facilities

Regulation of safety of nuclear fuel cycle facilities, nuclear power plants of ships and radiation hazardous facilities

Emergency preparedness and response

Supervision of accounting and control of nuclear materials and radioactive substances and physical protection

5. NS competence is planned to develop the following disciplines:

Technical aspects of ensuring the nuclear non-

Properties of nuclear materials, increasing their security

International Nuclear Non-Proliferation Regime

National Nuclear Nonproliferation Safeguards

Methods of physical measurements of nuclear materials

Destructive and non-destructive methods for determining the mass and isotopic composition

Instruments and equipment, measurement quality control

Accounting and control procedures for nuclear materials

Physical inventory

Seals, barcodes, etc.

Design and evaluation of the effectiveness of physical

Basic project threats

General principles of physical protection systems design

Vulnerability analysis of nuclear sites

Technical means of physical protection of nuclear

Sensors and detection

Physical barriers and delay systems

Access control

Conclusions &References: The implementation of this educational program will create a strengthened human resource in one of the key areas of state security..

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