



Department for Nuclear and Radiation Safety
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Design of radiation facilities in Belarus involves stakeholders represented by the Ministry of Emergency Situations – MES (the Department for Nuclear and Radiation Safety), Ministry of Healthcare (MOH) and Ministry of Architecture and Construction (MAC).

According to the Decree of the President of the Republic of Belarus of June 5, 2019 No. 217 “On building codes and regulations” the requirements in the field of architectural, urban planning and construction activities must be established in the building codes and rules, developed by the MAC with participation of stakeholders. Before the named Decree such requirements were included in the technical normative documents of MES, MOH, MAC.

As the Decree entered into force at the time before the approval of the new Law of Belarus “On Radiation Safety” of 18 June 2019, MES managed to include into the named Law the right of the Department for Nuclear and Radiation Safety to supervise the compliance of the documents issued by MAC. After that the Department for Nuclear and Radiation Safety actively took part in the development of the Building Code 3.02.13-2020 “Radiation Facilities”, approved by the Resolution of MAC dated November 27, 2020 No. 95.

The Building Code 3.02.13-2020 “Radiation Facilities” entered into force since June, 1, 2021.

As the next step the other building codes and regulations, including the building regulations “Composition and content of design documentation”, are being appropriately amended.

The current edition of the building regulations “Composition and content of design documentation” contain no information about radiation safety issues, and in practice information concerning ensuring radiation safety is included by design organizations to different parts of design documentation.

In order to cover the radiation safety issues the following proposals have been developed to include into the requirements for design documentation of radiation facilities:

- design of systems and elements important to safety (alarm and radiation warning system, interlocking system, physical barriers system, power supply system, ventilation system, special sewerage system);
- calculations of shielding (protection against ionizing radiation), allowing to ensure the reduction of doses to personnel and the public to permissible levels;
- organization of the radiation monitoring system (including the types, scope and procedure for radiation monitoring, a list of necessary instruments, auxiliary equipment, placement of stationary instruments and points of constant and periodic monitoring);
- organizational and technical measures to prevent a specific list of possible radiation accidents and to limit their consequences;
- organizational and technical measures to prevent errors and unauthorized actions of personnel, which can lead to a violation of the conditions for the safe operation of sources of ionizing radiation or to aggravate the consequences of a failure of any system (element);
- organizational and technical measures for radioactive waste management.

Also the educational program for managers and specialists on radiation safety issues in the design of radiation facilities at the Belarusian National Technical University was implemented, and the Department for Nuclear and Radiation Safety issued the appropriate permit to implement this program.

Generally according to the Law of Belarus “On Radiation Safety” of 18 June 2019 radiation safety of ionizing radiation sources (IRS) is assessed by 3 types of expertise:

1. **Expertise of sources of ionizing radiation** of the categories 1 – 4 which is carried out before the type approval of IRS and includes evaluation of:

- design, technical (operational) documentation of IRS;
- documents of the management system and (or) quality control of the IRS manufacturer, including those confirming the compliance of this system with international standards;
- availability of opportunities to ensure the installation, adjustment, repair, maintenance of the IRS on the territory of the Republic of Belarus.

2. **Expertise of radiation facilities**, which is carried out before the commissioning of IRS of the categories 1 – 3 and includes evaluation of:

- design documentation for the construction, reconstruction, repair (except for current repairs) of a radiation facility in terms of ensuring the radiation safety of this radiation facility;
- documents confirming the performance of works on the construction, reconstruction, repair of the radiation facility in accordance with the design documentation;
- compliance of the radiation facility with the design documentation and the requirements for ensuring radiation safety during its inspection.

3. **Pre-licensing expertise** or expertise of documents substantiating the provision of radiation safety when carrying out activities in the field of using sources of ionizing radiation, which is carried out when licensing activities in the field of using sources of ionizing radiation.

Decree of the President of the Republic of Belarus of April 5, 2021 No. 137 “On regulation of activities in the field of use of nuclear energy and sources of ionizing radiation” entered into force since October, 10, 2021 and removed the licensing of activities in the field of the use of atomic energy and ionizing radiation sources from the scope of the common Decree No. 450 (regulates all types of licensing in the Republic of Belarus) into a separate regulatory legal act. The new Decree No. 137 prescribed to include into the license the type of source of ionizing radiation and a place of carrying out the licensing activity.

For information: The license is to be obtained for:

- Operation, storage of sealed IRS of categories 1 – 3*
- Operation of radiation devices with accelerating voltages over 100 kV (IRS of category 2 for medical IRS, 4 – for IRS out of medicine), charged particle accelerators (category 2), X-ray mammographs (category 3)*
- Operation, storage of unsealed IRS of categories 1 and 2*
- Manufacturing (production) of radioactive substances and (or) products based on them, including their storage*
- Design (construction), manufacture (production), installation, adjustment of IRS (radiation devices) of categories 1 – 4*
- Design of radiation facilities with IRS of categories 1 - 4*
- Expertise in the field of IRS use*

Therefore the following amendments to the Law of Belarus “On Radiation Safety” of 18 June 2019 were prepared:

1. Expertise of a radiation facility can be combined with an expertise for licensing purposes in cases of:

- obtaining a license for the right to carry out activities in the field of the use of sources of ionizing radiation or
- amendments to the license due to the need to indicate in the license a new type of source of ionizing radiation and (or) a new place of work with it).

2. Expertise of radiation facilities is not obligatory if radiation facility is supposed to contain:

- mobile sources of ionizing radiation;
- unsealed sources of ionizing radiation of category 3;
- stationary devices generating ionizing radiation, put into operation by replacing them with similar radiation devices without changing the location in accordance with the available design documentation for the radiation facility, without changing the accelerating voltage upwards, without changing the direction of the primary ionizing radiation beam, without affecting the supply engineering systems, as well as in the presence of documents confirming the performance of work on the construction, reconstruction, repair of the radiation facility in accordance with the design documentation;
- stationary radiation devices, which structurally include protection against X-ray radiation, ensuring that the radiation dose rate is not exceeded at a distance of 0.1 m from accessible parts of the surface of the radiation device in the operating position of 1 μ Sv/h.

3. Commissioning of “licensed” IRS, is carried out after pre-licensing expertise and expertise of radiation facility (if needed) and obtaining the license;

Commissioning of “non-licensed” IRS – is carried out after notification to the Department for Nuclear and Radiation Safety about the preparation for commissioning of sources of ionizing radiation (afterwards the decision is taken with the Department if there is a need to do inspections)

Upon completion of IRS commissioning operators of IRS of categories 1 – 4 provide the Department for Nuclear and Radiation Safety with the act of IRS commissioning within 5 days from the date of drawing it up by the operator’s commission.

Regulations “On the safe management of IRS. General provisions.”, approved by the Resolution of MES of October 19, 2020 No. 42, contain the requirements for the following information needed to be included to the act of IRS commissioning:

- composition of the commission of IRS operator;
- type (types) of IRS being put into operation, indicating serial numbers, years of manufacture, maximum accelerating voltage (for generators, except for charged particle accelerators), maximum energy of charged particles (for charged particle accelerators), radionuclide, activity and numbers of passports (certificates) of sealed and unsealed IRS (if available);
- name and location (including the address, floor, office (premises) number) of the radiation facility, taking into account the design documentation for the radiation facility;
- data about the design documentation for the radiation facility, including information about the design organization that developed it, indicating the subcontractors (if any) and the date of its approval;
- technical (operational) documentation for commissioned IRS (operating manuals (instructions), passports for equipment, etc.);
- data, confirming the safety of operation of commissioned IRS and the compliance of the characteristics of IRS, systems and elements of radiation facility and IRS with design documentation for radiation facility, technical (operational) documentation for IRS (results of installation and adjustment (if necessary) of radiation devices, results of testing the operational parameters, results of radiation monitoring, equipping the radiation facility with radiation protection equipment etc.);
- fulfillment of organizational requirements of Regulations “On the safe management of IRS. General provisions.”, approved by the Resolution of MES of October 19, 2020 No. 42 (paragraphs 65 - 71, 73 - 75 (as far as they are concerned)).