NATIONAL REPORT
OF THE REPUBLIC OF BELARUS

ON THE IMPLEMENTATION
OF THE CONVENTION ON NUCLEAR SAFETY

MINSK
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Acronyms, abbreviations and definitions

ALARA – As Low as Reasonably Achievable
APC – Automatic power controller
AREMS – Automated radiation environment monitoring system
BCP – Backup control panel
BDBA – beyond design basis accident
Belarusian NPP State Enterprise (SE "Belarusian NPP") – Republican Unitary Enterprise "Belarusian Nuclear Power Plant"
BNTU – Belarusian National Technical University
BSU – Belarusian State University
BSUIR – Belarusian State University of Informatics and Radio Electronics
CIS – Commonwealth of Independent States
CNRS – State Scientific and Technical Institution "Center for Nuclear and Radiation Safety" of the Ministry for Emergency Situations of the Republic of Belarus (the main organization for scientific and technical support of the regulator)
Convention – Convention on Nuclear Safety
CPS CE – reactor control and protection system control elements
CSTO – Collective Security Treaty Organization
EHRT – Emergency heat removal tanks
EIA – Environmental impact assessment
FA – Fuel Assembly
FE – Fuel Element
FODMS – facilities of the operational dispatching management system
FSS – Full-scale simulator
Gosatomnadzor – Department for Nuclear and Radiation Safety of the Ministry for Emergency Situations of the Republic of Belarus. It is the authorized state regulatory body in the field of ensuring safety in the use of atomic energy, as well as the regulatory body in accordance with the Convention on Nuclear Safety and the Joint Convention
Government – Council of Ministers of the Republic of Belarus
GSP NPP – Norms and Rules for ensuring nuclear and radiation safety "General Provisions for Ensuring the Safety of Nuclear Power Plants", approved by Resolution of the Ministry for Emergency Situations of the Republic of Belarus No.15 dated April 13, 2020
HEI – Higher educational institution
HLRW – High-level radioactive waste
IAC – Information and Analytical Center of Gosatomnadzor
IAEA – International Atomic Energy Agency
ILRW – Intermediate-level radioactive waste
IMS – Integrated management system
IRG – Inert radioactive gases
IRS – Ionizing radiation sources
JSC – Joint Stock Company
Licensing control – control over the compliance by licensees with licensing legislation, licensing requirements and conditions for carrying out activities in the field of using atomic energy and ionizing radiation sources, including special licensing requirements and conditions
LLRW – Low-level radioactive waste
LRW – Liquid radioactive waste
LWR – Light-water reactor
MCE – Maximum considered earthquake
MCR – Main control room
MEDGS – Mobile emergency diesel generation station
MES – Ministry for Emergency Situations of the Republic of Belarus
NF – Nuclear Fuel

NPP – Nuclear Power Plant
NPP QAP – Nuclear Power Plant Quality Assurance Program
NRC – The US Nuclear Regulatory Commission
NZK – Non-returnable protective container
OO – Operating organization (Operator)
PE – Psychophysiological examination
PHRS – Passive Heat Removal System
PIQ – Professionally important qualities
PSA – Probabilistic safety analysis
RCMER – Institution “Republican Center for Management and Response to Emergency Situations” of the Ministry for Emergency Situations of the Republic of Belarus
Regulator (regulatory body) – see Gosatomnadzor
RLA – Regulatory legal acts
RM – Radiation monitoring
RS – Reactor system
RW – Radioactive waste
RWDF – Radioactive waste disposal facility
SA – Supervised area
SAR – Safety Analysis Report
Scientific Institution “JIPNR Sosny” – State Scientific Institution “Joint Institute for Power and Nuclear Research Sosny” of the National Academy of Sciences of the Republic of Belarus
SEPCS – State Emergency Prevention and Control System of the Republic of Belarus
SFSP – Spent fuel storage pool
SG – Steam generator
SNF – Spent nuclear fuel
SO – Scheduled outage
SRW – Solid radioactive waste
STC – Simulation Training Center of State Enterprise “Belarusian NPP”
TCP – Technical code of common practice
TRSO – Technological Regulations for Safe Operation
TSO – Scientific and technical support organization
VLLRW – very low-level radioactive waste
WANO – World Association of Nuclear Power Operators
WWER – Water-Water Energetic Reactor

INTRODUCTION

National Report

The National Report of the Republic of Belarus on the Implementation of the Convention on Nuclear Safety (hereinafter referred to as the National Report) has been prepared for the 10th meeting of the Contracting Parties in line with Article 5 of the Convention on Nuclear Safety (hereinafter referred to as the Convention). It describes the implementation of the country's obligations under the Convention in 2022-2025 in the context of the implementation of the first nuclear power program. The document is based on the Guidelines for National Reports submitted in accordance with the Convention (Information circular INFCIRC/572/Rev.8 dated March 25, 2025).

The National Report has been prepared by Gosatomnadzor using materials provided by the Ministry of Energy, the Ministry of Health, the Ministry of Natural Resources and Environmental Protection, the Ministry for Emergency Situations, the Ministry of Education, and the National Academy of Sciences of Belarus (Scientific Institution “JIPNR-Sosny”). Since joining the Convention in 1998, the Republic of Belarus has prepared and submitted nine National Reports (1999, 2001, 2004, 2007, 2011, 2013, 2016, 2019, 2022), as well as one extraordinary report dedicated to the lessons of the accident at the Fukushima Daiichi NPP (Japan).

During the three-year period since the submission of the previous National Report (August 2022), the Republic of Belarus continued to demonstrate its commitment to comply with the Convention. The country has worked to develop and improve the nuclear infrastructure and its individual components: regulatory legal framework, supervisory activities, licensing, emergency preparedness and response, nuclear safety, spent nuclear fuel and radioactive waste management, the system of scientific and technical support for regulatory activities in the field of nuclear and radiation safety, the system of scientific and technical support for the Belarusian NPP.

The Republic of Belarus is committed to continuous improvement of nuclear and radiation safety. International assessment missions and peer reviews are the important tool in this direction. During the construction and commissioning of the Belarusian NPP, the Republic of Belarus accepted all the key missions recommended by the IAEA to a newcomer country in the field of nuclear energy, and conducted stress tests of the Belarusian NPP according to the procedure of the European Nuclear Safety Regulators Group (ENSREG). In continuation of this work, the Republic of Belarus has invited an IAEA Education and Training Appraisal Mission (EduTA) scheduled for November 2025.

Nuclear power program of the Republic of Belarus

Given the scale of its nuclear power program, the Republic of Belarus is a Category 2 Contracting Party to the Convention.

The definition of Article 2 of the Convention is met in the Republic of Belarus by the Belarusian NPP with two power units. Information on the location of the Belarusian NPP, the type of reactors and their status is given in Table 1.

The decision to build it in the country was made in early 2008. The Belarusian NPP with two WWER-1200 reactors with a total capacity of 2400 MW was built according to the Russian “AES-2006 design”. The first power unit was commissioned in 2021, the second - in 2023. Before the decision was made to issue a license for commercial operation, public hearings had been held by the regulator for each of the power units.

Table 1. Information on the nuclear installation of the Republic of Belarus that meets the definition of Article 2 of the Convention

Location	Licensee	Unit	Type	First chain reaction (MCL)	Capacity (MW)	Status
Republic of Belarus, Grodno region, Ostrovets district, Vornyany rural executive committee, 2/7	Republican Unitary Enterprise "Belarusian Nuclear Power Plant"	1	WWER	07.08.2020	up to 1194	in operation
		2	WWER	25.03.2023	up to 1194	in operation

SUMMARY

The nuclear power program of the Republic of Belarus belongs to Category 2, as defined by the organizational documents related to the 10th Review Meeting of Contracting Parties to the Convention.

The Republic of Belarus implements all articles of the Convention, information on their implementation is presented in this National Report.

As progress has been made in the implementation of the first nuclear power program within the current conventional cycle, efforts to improve the nuclear and radiation safety infrastructure have been continued, taking into account the recommendations of international assessment missions and peer review reports, as well as the conclusions of the Review Meetings of the Contracting Parties to the Convention.

Summary of work accomplished on Challenges and Suggestions

Based on the results of the 8th and 9th Joint Meeting of the Contracting Parties on the implementation of the Convention on Nuclear Safety, 4 Challenges and 5 Suggestions were identified for the Republic of Belarus.

Challenge 1:

"Belarus should strengthen provisions for effective mechanisms of communication, transparency, and consulting to inform public and interested parties about incidents in facilities and activities, including accidents and abnormal occurrences, and other information, as appropriate."

The challenge is closed.

At present, information about violations in the operation of the Belarusian NPP is sent in a mandatory manner to the republican state governing bodies in the field of atomic energy use and the republican state governing bodies implementing state regulation of activities to ensure safety in the use of atomic energy.

In accordance with the local procedures of the OO, an operational message about a violation in the operation is transmitted orally (via available communication channels) after the violation is detected, and also in writing within 1 hour after the violation is confirmed. In order to clarify the state of the power unit, a preliminary message about the violation in the operation is prepared and sent to Gosatomnadzor within 24 hours.

The Ministry of Energy (the state body superior to the OO) and its subordinate organizations, in cooperation with the Ministry of Information, relevant state bodies, and other interested parties, are working to cover in the media, social networks, and messengers the issues related to the development of the nuclear power infrastructure and nuclear safety in the country, the operation of the Belarusian NPP, including information on unscheduled shutdowns of power units from the grid with subsequent explanation of their causes.

In order to contribute to a positive attitude toward the design among the population, the information agenda includes issues of strengthening nuclear and radiation safety, training, retraining, and advanced training of personnel, management of radioactive waste and spent nuclear fuel, developing a safety culture, etc.

Preparation of comments for the media is carried out with the involvement of scientists, experts, parliamentarians, representatives of local authorities, and youth activists of the OO.

Briefings, press conferences, round tables are regularly held to clarify the issues of NPP operation, as well as to popularize the nuclear industry, special projects on documentary film production are implemented jointly with the country's leading mass media, press tours to the Belarusian NPP are organized for Belarusian and foreign media, representatives of the blogosphere.

Particular attention is paid to informing citizens through direct telephone lines, meetings in work teams, and organizing excursions to the information center of the Belarusian NPP.

For prompt and comprehensive coverage of the work of the Belarusian NPP, press releases are regularly sent to the state media, information is posted in departmental telegram channels and social networks.

The regulatory body also works with the public. Reviews of the state of radiation safety in the Republic of Belarus are published on an annual basis. Any events at the Belarusian NPP that have public resonance are interpreted by the regulator from the point of view of their impact on nuclear and radiation safety and are communicated to the population both through the media (speeches on radio and TV channels) and by posting information on the website. When making important decisions (issuing licenses for the operation of NPP power units), the mechanism of public hearings provided for by law was used.

Challenge 2:

"Safe operation of power units No. 1 and 2 of the Belarusian NPP after the successful completion of their trial operation period, as well as licensing and supervision of the construction of power unit No. 2 of the Belarusian NPP and with assuring that the VDNS principle 1 is met."

The challenge is closed.

The Republic of Belarus has taken comprehensive measures to improve the licensing and regulatory supervision system to ensure their efficiency and effectiveness during the operation of the Belarusian NPP. The Belarusian regulator has ensured licensing of NPP personnel with the establishment of an appropriate mechanism for monitoring compliance with the terms of such licenses (personal permits). Detailed information on the changes made is provided in subsections 7.2 (iii) and 7.2 (iv)) of Article 7. All necessary regulatory requirements for ensuring NPP safety have been established and are monitored, including requirements for safety management systems, safety culture, equipment configuration management, etc. The structure of the OO contains all elements provided for in the design and justified in the Safety Analysis Report, including internal supervision units in the OO. The relevant information is provided in various chapters of this Report. The regulatory body has carried out an appropriate redistribution of its own resources. The system of scientific and technical support for the regulatory body has been significantly improved. Detailed information is provided in Article 8. Information on the site selection taking into account Principle 1 of the Vienna Declaration has been provided in previous National Reports and is also provided in Article 17.

Challenge 3:

"Conducting public hearings on power unit No. 2."

The challenge is closed.

On September 8, 2023, Gosatomnadzor held public hearings before issuing a license to operate power unit No. 2 of the Belarusian NPP. The event was held in a hybrid format. Participants were located in 4 studios (in Ostrovets, Minsk and Gomel) and also connected remotely (via videoconferencing). The event was observed by representatives of Belarusian universities involved in training personnel for the nuclear industry, scientific organizations of the technical support system for regulatory activities, organizations involved in activities to overcome the consequences of the Chernobyl disaster, and foreign organizations from 12 countries related to the regulation of nuclear and radiation safety. In total, more than 200 people took part in the public hearings. Detailed information is provided in Article 8.

Challenge 4:

"Belarus should have enough resources for the full scope implementation of the regulatory oversight onsite taking into account subsequent development of the radioactive waste infrastructure, that includes newly established organization for operating radioactive waste disposal facility, as well as the expansion of the RB`s functions connected with the Chernobyl origin nuclear legacy sites."

The challenge is closed.

In order to comprehensively and effectively ensure the implementation of regulatory functions, taking into account the development of the nuclear power program, the emergence of new tasks and challenges in the period from 2022 to 2025, the staffing structure of Gosatomnadzor was updated *(in connection with the transition to operation of power units of the Belarusian NPP, new tasks related to the regulation of activities in the territories and facilities affected by the disaster at the Chernobyl NPP, long-term plans for the construction of nuclear facilities, the integrated solution of financial and economic support for activities, including within the framework of the implementation of state programs and the development of new programs within the framework of the Union State of the Republic of Belarus and the Russian Federation).* The system of scientific and technical support for the regulator has been significantly improved, including in terms of the creation of the National Commission for the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus [3.2].

The resources currently available to the regulatory body are sufficient to ensure regulatory functions in relation to all supervised entities in the country.

Suggestion 1:

"To continue efforts in exchanging information, participation and cooperation with neighboring countries."

The suggestion is closed.

Currently, the results of radiation and environmental monitoring in the Belarusian NPP surveillance zone are provided through the responsible regulatory body (the Ministry of Natural Resources) to all interested countries as part of the implementation of the Belarusian NPP Post-Design Analysis Program for the Republic of Belarus to fulfil its obligations under the Convention on Environmental Impact Assessment in a Transboundary Context.

Up-to-date information on the state of the radiation situation in the Belarusian NPP surveillance zone is posted on the global computer network Internet on the official website of the State Enterprise "Belarusian NPP" (https://www.belaes.by/ru/radiatsionnaya-obstanovka).

The regulatory body has concluded and is implementing bilateral agreements on prompt notification of a nuclear accident and exchange of information with all neighbouring countries (Latvia, Lithuania, Poland, the Russian Federation, Ukraine).

Suggestion 2:

"Timely share domestic events of interest at Belarusian NPP, with their associated lessons learned, through the IAEA/OECD-NEA International Reporting System (IRS)."

The suggestion is closed.

Preparation of operating experience materials for their transfer to the IAEA IRS information system is carried out in accordance with the "Procedure for interaction between the Department for Nuclear and Radiation Safety of the Ministry for Emergency Situations of the Republic of Belarus and the State Enterprise "Belarusian NPP" regarding the transfer of information on events to the IAEA InterNational Reporting System on NPP operating experience. This Procedure defines the criteria for selecting information to be transferred, the procedure for interaction in preparing information, and the procedure for preparing and transferring information from the State Enterprise "Belarusian NPP" to Gosatomnadzor. The relevant information about the events is posted in the IRS system.

Suggestion 3:

"Belarus as a newcomer country should consider invitation of ISCA mission for the matter of evaluation of the current progress made and planned activities for fostering an infrastructure that promotes a strong safety culture and to be sure that such activity is in line with best international practices."

Since the 8th and 9th Joint Meetings of the Contracting Parties, the regulatory framework for safety culture aspects has been significantly improved (more details are provided in Article 12). However, the practical implementation of the new provisions of the Law “On Safety Regulation in the Use of Atomic Energy” regulating safety culture has not been completed.

In addition, in 2025 (from 11 to 12 September) a pilot Forum is planned to conduct research to identify national characteristics affecting safety that need to be taken into account when forming safety culture models in bodies and organizations involved in the implementation of programs for the peaceful use of nuclear technologies. The Forum will be held with the support of the Basic Organization of the CIS Member States for the Creation of National Nuclear Infrastructures under the auspices of the Commission of the CIS Member States on the Peaceful Uses of Atomic Energy. One of the main results of the Forum is expected to be the formulation of a list of national characteristics (cultures) that can influence the behaviour of NPP personnel, as well as employees of government agencies and organizations when making decisions related to ensuring nuclear and radiation safety. Such a list is planned to be used for further improvement of the nuclear safety culture both by establishing additional standards in terms of the influence of the human factor, and by taking into account when forming (updating existing) models of the safety culture of OOs and other interested organizations (government agencies).

The OO continuously carries out activities to develop safety culture with periodic self-assessments in accordance with IAEA recommendations. In addition to such self-assessments, independent safety culture assessments are conducted within the framework of WANO peer reviews and IAEA missions. The high level of convergence of the results of safety culture self-assessments with the results of independent peer reviews of safety culture has been achieved. Based on these comparisons, measures for additional improvements are developed and implemented.

In connection with the above, the ISCA mission is planned to be conducted after the final implementation of all legislative innovations (approximately 2028). In this regard, the suggestion for the next reporting period 2025-2028 is considered closed.

Suggestion 4:

“Covering all aspects of human factors in the next National Report.”

The proposal is closed.

Article 12 of this Report provides comprehensive information on the fulfilment by the Republic of Belarus of the obligations arising from the relevant article of the Convention.

Suggestion 5:

“Belarus should implement the remaining recommendations on the stress test peer review action plan in a timely manner.”

The proposal is closed.

As noted earlier in the National Reports, the Republic of Belarus voluntarily conducted stress tests of the Belarusian NPP according to the ENSREG procedure, underwent a peer review of their results by ENSREG, as well as a peer review of the implementation of the National Action Plan, prepared based on the results of the stress tests. The issues are closed, the recommendations and suggestions are implemented and executed. Thus, as of May 2025, out of 25 recommendations, 4 of which were added in November 2021, 22 have been implemented and 3 are in the process of being implemented, with these recommendations aimed at a deeper study of safety issues. The deadlines for the implementation of the recommendations set by the National Plan are met. The implementation of the plan is under the control of the regulator. Detailed information is provided in Article 6 of this report.

Summary of significant changes since previous National Report

In addition to the above mentioned activities undertaken to address the challenges and suggestions formulated during the previous meeting of the Contracting Parties, the following significant changes related to the fulfilment of obligations under the Convention have taken place in the Republic of Belarus (more detailed information is provided in the text of the National Report in the relevant sections):

Articles 6 and 18:

• in October 2023, commercial operation of power unit No. 2 of the Belarusian NPP began in accordance with the special permit (license) issued by the regulatory authority. Thus, since the publication of the previous National Report, both units of the Belarusian NPP have successfully completed the construction stage and moved on to the operation stage;

• the Program for maintaining and improving the safety of the Belarusian NPP for the operating lifetime of power units No. 1 and 2 has been developed, implemented and is updated annually, allowing, among other things, to accumulate funds for the implementation of long-term expensive measures.

Articles 7 and 8:

• the main legislative acts were updated (taking into account the transition of the Belarusian NPP to the operational stage), relevant government decrees were issued and the procedures of the regulatory body were updated, aimed at further improvement of the system of regulatory assessments and supervision;

• the Law of the Republic of Belarus “On Safety Regulation in the Use of Atomic Energy” [2.2] came into force, replacing the previously effective Law of the Republic of Belarus “On the Use of Atomic Energy”. The new Law legally establishes the status of the state regulatory body in the field of ensuring safety in the use of atomic energy in accordance with Articles 7 and 8 of the Convention on Nuclear Safety and Articles 19 and 20 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management for Gosatomnadzor;

• in 2023, the system of scientific and technical support for regulatory activities in the field of atomic energy use was significantly improved, including the newly created National Commission on the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus, which annually informs the Government about the work carried out [3.2].

Article 10:

• based on the results of commissioning of power unit No. 2 of the Belarusian NPP, as well as taking into account all modifications carried out at the NPP, the value of the probability of severe accidents for 1 year and the average value of the total probability of a large accidental release for 1 year were recalculated and adjusted. These indicators correspond to generation 3+ reactors (reactors using passive safety systems);

• based on the results of commissioning of power units of the Belarusian NPP, for each power unit of the NPP the following were developed: “Final Safety Analysis Report”, “Probabilistic Safety Analysis Level 1”, “Probabilistic Safety Analysis Level 2”, which present information corresponding to the actual state of the NPP based on the results of construction, manufacture, installation, pre-commissioning adjustment works and inspections at the power unit, as well as the results obtained at the stages of physical, energy start-ups and trial operation of power units of the Belarusian NPP. Changes resulting from commissioning works that affect the operating conditions of the power unit were previously included in the preliminary version of the SAR and were safety assessed by the time the license for operation of power units No. 1 and 2 of the Belarusian NPP was issued.

• in 2024, the OO conducted a self-assessment of the level of safety culture at the State Enterprise “Belarusian NPP”, the results of which were reviewed at a meeting of the Council on Safety Culture of the State Enterprise “Belarusian NPP”, and areas for improvement were identified.

Article 11:

• the OO received a special permit (license) from the Ministry of Education of the Republic of Belarus to implement an educational program for advanced training of management personnel on the basis of the Training Center and to conduct the corresponding state accreditation procedure (confirmation of the issued license). The measures taken allow part of the educational programs for advanced training to be implemented directly in the Training Center, which expands the opportunities for training both NPP personnel and other organizations involved in the implementation of the nuclear power design.

Article 12:

• the legislative framework has been significantly improved, including both high-level documents and detailed regulatory requirements regarding aspects of the formation and continuous improvement of safety culture, as one of the main instruments of influence on the activities of the personnel of the OO and other interested organizations.

• the holding of a Forum on the identification and subsequent consideration of national characteristics (cultures) potentially affecting the performance of personnel duties with the participation of all interested organizations of the Republic of Belarus and experts from the vendor country – the Russian Federation – has been prepared (planned for the period after the uploading of this National Report).

Article 13:

• legislative requirements for quality assurance have been updated – both at the level of the Law of the Republic of Belarus and at the level of technical regulatory requirements in full compliance with the latest IAEA requirements;

• the regulator has implemented procedures for overseeing the effectiveness of the OO IMS, including in terms of processes related to quality management;

• the OO has implemented a quality management system that includes special requirements for the application of ISO 9001:2015 by organizations in the nuclear power supply chain that supply products and services important to nuclear safety in accordance with STB ISO 19443 "Quality management systems. Special requirements for the application of ISO 9001:2015 by organizations in the nuclear power supply chain that supply products and services important to nuclear safety."

Article 14:

• the list of documents justifying safety subject to safety assessment within the framework of safety review procedures has been expanded;

• the requirements for conducting annual assessments of the current safety of NPP units have been updated. 5 safety guides containing recommendations on various aspects of safety-related equipment resource management have been published;

• the regulatory body has improved approaches to admitting experts to participate in conducting safety reviews on various aspects of the NPP operations;

• the OO has made organizational and staffing changes aimed at improving the OO internal safety control system. A number of safety peer reviews by WANO have been passed.

Article 15:

There have been no significant changes in the radiation protection system since the publication of the previous National Report.

Article 16:

There have been no significant changes in the previously established emergency preparedness and response system, or in the system of informing the population since the publication of the previous National Report.

Article 17:

Since the submission of the previous National Report, no site selection for new nuclear installations falling under the definition of Article 2 of the Convention has been carried out in the

Republic of Belarus; the regulatory framework related to site selection for nuclear installations has not changed.

Article 19:

• As part of the implementation of the Strategy of SNF Management of the Belarusian NPP [3.16], some of the priority activities were carried out:

an agreement was concluded between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the field of SNF management of the Belarusian NPP, which entered into force on May 22, 2023;

an agreement was concluded between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the transportation of nuclear materials, which entered into force on May 31, 2022;

a draft contract was prepared that will define the scope of cooperation and other conditions for the import of SNF to the Russian Federation, the reprocessing of SNF from the Belarusian NPP and the subsequent return to the Republic of Belarus of radioactive waste generated after the reprocessing of SNF;

• Strategy of Radioactive Waste Management has been developed, within the framework of which the implementation of priority measures has begun aimed at creation of a radioactive waste disposal facility intended, including for the long-term storage of returned waste from spent nuclear fuel reprocessing.

Notable achievements

During the reporting period, the Republic of Belarus has made the following notable achievements:

- The Republic of Belarus actively uses all available tools to maintain the global nuclear safety regime, demonstrating an unconditional commitment to its continuous improvement (Subsection 7.0 (Article 7));
- The Republic of Belarus has fully formed the nuclear law system and continues to improve it (Subsection 7.1 (Article 7));
- The Republic of Belarus has significantly improved the system of scientific and technical support for regulatory activities in the field of nuclear and radiation safety (Subsection 8.1 (Article 8));
- The Republic of Belarus has organized close cooperation with the vendor country on scientific, technical and other support for regulatory and supervisory activities on both sides (Subsection 8.1 (Article 8));
- The Republic of Belarus has carried out significant work to introduce the concept of safety culture into the activities of interested state bodies and organizations (including OOs) related to the operation of the Belarusian NPP (Subsection 12(a) (Article 12));
- The Republic of Belarus has systematically organized measures aimed at continuously improving the safety of the NPP (Article 19);
- The Republic of Belarus makes significant efforts to continuously improve the emergency preparedness and response system (Article 16.1 (b)).

Future focus:

During the next three-year cycle of the Convention, the main efforts will be focused on unconditional provision of nuclear and radiation safety of the power units of the Belarusian NPP in the mode of their commercial operation, as well as on further improvement of the infrastructure ensuring nuclear and radiation safety. As part of maintaining the global safety regime, the Republic of Belarus will continue to disseminate positive experience and accumulated knowledge on ensuring safety during the construction and operation of the first Belarusian NPP.

In this regard, the Republic of Belarus has identified the following priority areas for further efforts to build the capacity of the nuclear and radiation safety infrastructure, taking into account the possibility of expanding the nuclear power program of the Republic of Belarus:

improving the system of scientific and technical support for regulatory activities, scientific and engineering support for OO, as well as increasing the institutional capabilities of the regulator to ensure readiness for the first periodic safety assessment of power unit No. 1 of the Belarusian NPP;

strengthening the institutional capabilities (including capacity building) of the regulatory body, OO and other interested government agencies and organizations, taking into account the possible expansion of the nuclear power program and the simultaneous implementation of new non-power nuclear projects for the country;

further improvement of mechanisms for sharing experience accumulated by Belarusian specialists during the construction and operation of the first NPP with newcomer countries within the framework of maintaining the global nuclear safety regime.

Major common issues

At the previous meeting of the CNS Contracting Parties, major common issues were identified. The table below provides information on which part of the Report they are described in.

Major common issue	Article, page
1. Managing extraordinary circumstances impacting the safe operation of nuclear installations	Article 6, p. 18 Article 11, p. 53
2. Strengthening national regulatory capabilities taking into account new and innovative technologies	Article 8, p.33-34
3. Fostering international collaboration	Introduction, p.6 Article 7, p. 23, 24-25
4. Foster international peer review missions and timely addressing of findings	Article 10, p.48
5. Possible impact of global climate changes on the safe operation of nuclear installations	Article 19, p. 95-96
6. Securing reliable supply chains	Article 13, p. 62
7. Strategies for ageing management in support of the operation of nuclear installations	Article 14, p. 66
8. Strengthening emergency preparedness and response arrangements and fostering cross border collaboration	Article 16, p. 79-80

PART A. GENERAL PROVISIONS

ARTICLE 6. EXISTING NUCLEAR INSTALLATIONS

Each Contracting Party shall take the appropriate steps to ensure that the safety of nuclear installations existing at the time the Convention enters into force for that Contracting Party is reviewed as soon as possible. When necessary, in the context of this Convention, the Contracting Party shall ensure that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installation. If such upgrading cannot be achieved, plans should be implemented to shut down the nuclear installation as soon as practically possible. The timing of the shut-down may take into account the whole energy context and possible alternatives as well as the social, environmental and economic impact.

Summary statement for Article

At the time of entry into force of the Convention, the Republic of Belarus had no nuclear installations. At the same time, during the implementation of the Belarusian NPP design, all safety reviews and assessments required by the IAEA approaches were carried out. The provisions of Article 6 are being fully implemented.

6.0 Introduction

There is one nuclear installation in the Republic of Belarus that complies with Article 2 of the Convention, namely the Belarusian NPP consisting of two power units with WWER-1200 (V-491) reactors (technical characteristics of the power units are presented in Table 2).

In addition to the specified nuclear installation, there are scientific installations in the country (located in the Scientific Institution "JIPNR-Sosny") that do not comply with the definition of Article 2 of the Convention on Nuclear Safety (2 critical facilities, 1 subcritical facility, as well as the corresponding nuclear material storage facilities for these facilities).

Table 2

Main technical characteristics of the power unit of the Belarusian NPP with WWER-1200.

Parameter	Value
Number of units, pcs.	2
Service life, years: RS	60
Steam turbine unit	50
Power unit capacity, MW	
electric (gross)	up to 1194
thermal	3200
Power unit heating capacity, MW	46,6
Installed capacity utilization factor, relative units	0,9
Electricity consumption for own needs (including costs of circulating water supply and site water supply), %	7,0
Number of fuel assemblies in the core, pcs.	163
Number of fuel assemblies with CPS CE, pcs.	121
Duration of the fuel-element lifetime, years	3-4
Main parameters of the primary coolant (with RS operating at rated capacity):	
temperature at core inlet, °C	298,2
temperature at core outlet, °C	328
coolant heating in the core, °C	29,8

coolant flow rate through the reactor, m3/h	90400
pressure at core outlet, MPa	16,2
steam pressure at SG outlet, MPa	7,0
SG steam capacity, t/h	1602
feed water temperature, °C	225
steam humidity at SG outlet, %, not more	0,2

6 (a) General information about the Belarusian NPP

The Belarusian NPP was built according to the AES-2006 design of JSC St. Petersburg Research and Design Institute of Power Technologies ATOMENERGOPROEKT (JSC ATOMENERGOPROEKT) of generation 3+, which is distinguished by improved safety characteristics and technical and economic indicators, including:

additional safety systems: PHRS; passive system for filtering leaks into the intershell space; double protective containment; fuel melt trap in case of a BDBA;

maximum implementation of the defence-in-depth principle – creation of a system of physical barriers to the spread of ionizing radiation and radioactive substances into the environment, as well as a system of technical and organizational measures to protect the barriers and maintain their effectiveness.

Thus, the system of physical barriers of the Belarusian NPP includes the fuel matrix, shells of fuel elements, the boundary of the reactor coolant circuit, hermetic enclosure of localizing safety systems. The barriers ensure the implementation of such safety functions as reactivity control, residual heat removal and localization of radioactive materials in operational states, during and after a design basis accident and, as far as is practically possible, in the event of emergency conditions that go beyond the design basis accidents.

Leningrad NPP-2, two power units of which were put into commercial operation on October 29, 2018 and March 22, 2021, is a reference for the Belarusian NPP. During the development of the design, a comparison of the main characteristics and parameters of the NPP power unit with WWER-1200 was carried out with the data of the reference NPP with WWER-1000 (V-428) and with foreign NPPs.

The design complies with international standards and IAEA recommendations, as well as principle 1 of the Vienna Declaration on Nuclear Safety of 9 February 2015: “New nuclear power plants are to be designed, sited, and constructed, consistent with the objective of preventing accidents in the commissioning and operation and, should an accident occur, mitigating possible releases of radionuclides causing long-term off site contamination and avoiding early radioactive releases or radioactive releases large enough to require long-term protective measures and actions.”

In accordance with the requirements of GSP NPP [4.14], a periodic safety assessment should be carried out every 10 years in accordance with the established procedure. Such a safety assessment for power unit No. 1 of the Belarusian NPP should be carried out no later than 2031.

Since the commissioning of power units No. 1 and No. 2 of the Belarusian NPP, four scheduled maintenance operations have been carried out at the Belarusian NPP to maintain the reliability of the equipment for the period 2021-2024. Of these, three scheduled preventive maintenance operations were carried out at power unit No. 1 (2022 – major repairs, 2023 – current repairs, 2024 – medium repairs), one scheduled preventive maintenance operation (major) at power unit No. 2.

Power units No. 1 and 2 are in operation.

The requirements of the GSP NPP [4.14] stipulate that the OO should carry out safety improvement activities in accordance with plans drawn up taking into account the results of safety analyses and operating experience, in order to achieve the NPP safety targets established by regulatory documents.

An analysis of the need to develop and implement additional safety improvement measures in the context of the Convention or the Vienna Declaration on Nuclear Safety indicates that there is no such need at the present time. At the same time, the operating organization systematically analyses and develops measures aimed at continuously improving the safety of power units No. 1 and No. 2 of the Belarusian NPP.

In particular, during the operation period of 2022-2025, 188 technical solutions for permanent modifications were developed at power units No. 1 and 2 of the Belarusian NPP, 102 of which affect safety. Additionally, during the above-mentioned period, 84 temporary modifications were implemented at power units No. 1 and 2. The procedure for carrying out modifications is established by regulatory requirements and includes procedures for assessing their impact on safety.

Detailed information on conducting safety assessments of a nuclear installation is provided in Articles 14 (Safety assessment) and 19(7) (Operation).

<u>Suggestion based on the results of the 8th and 9th Joint Meeting of the Contracting Parties</u>

“Belarus should implement the remaining recommendations on the stress test peer review action plan in a timely manner”

As noted earlier in the National Reports, the Republic of Belarus voluntarily conducted stress tests of the Belarusian NPP according to the ENSREG procedure, underwent a peer review of their results by ENSREG, as well as a peer review of the implementation of the National Action Plan, prepared based on the results of the stress tests. The issues are closed, the recommendations and suggestions are implemented and executed. Thus, as of May 2025, out of 25 recommendations, 4 of which were added in November 2021, 22 have been implemented and 3 are in the process of being implemented, with these recommendations aimed at a deeper study of safety issues. The following activities were also completed:

- tests were conducted on emergency water supply to EHRT and SFSP using the AC-5.0-50/4 fire engine, and the possibility of supplying the design amount of water to SFSP and EHRT was confirmed;
- the power units of the Belarusian NPP were equipped with a second 500 kW MEDGS for use in beyond-design modes;
- based on design solutions and taking into account proposals based on the results of stress tests of the Belarusian NPP, an analysis of the survivability and habitability of control zones (MCR, BCP) was carried out, which is reflected in the corresponding report;
- the PSA of seismic impacts was adjusted taking into account the refined seismic hazard curves;
- calculations were performed on the resistance to seismic impacts of safety-critical equipment of power unit No. 1 of the Belarusian NPP, performed based on the results of determining the dynamic characteristics of category 1 seismic resistance equipment;
- to control possible geodynamic activity of the Oshmyany fault, the optimal location and resolution of the local seismological monitoring network in the area of the Belarusian NPP have been assessed;
- an assessment of the possibility of providing backup power to a backup auxiliary transformer for own needs through Vilia substation under beyond design conditions, has been performed. The reliability of the power supply of responsible consumers of own needs from the emergency backup transformer of own needs (ARTSN) 110/10 kV has been estimated;
- a report “Demonstration of practical exclusion of an early large emergency release taking into account the safety concept of the Belarusian NPP” based on IAEA and WENRA approaches, has been developed;
- the sufficiency of the design solution and the inexpediency of ensuring the operation of the leak containment system from the protective shell of the reactor building under severe accident conditions combined with complete blackout, is shown;
- emergency procedures have been developed and implemented in a symptom-oriented format;
- the possibility of supplying water to the steam generator has been ensured during a severe accident in order to protect the tubes from destruction as a result of high-temperature creep;
- an assessment of the reliability of the functioning of active safety systems has been performed taking into account dependent failures of fire extinguishing systems of seismic resistance categories 2 and 3 during maximum considered earthquake. The adequacy of the

design solutions and the inappropriateness of fastening fire extinguishing systems of seismic resistance categories 2 and 3 to seismic resistance category 1 have been demonstrated;

- international experience in providing scientific research with observation data from the seismological monitoring network in the areas of NPP locations has been studied and a technology and procedure for accessing data from the Belarusian network has been developed;
- a report “Analysis of possible measures to prevent severe accidents in an open reactor in the event of loss of external and emergency power supply to a power unit”, has been developed, containing a description of possible additional measures and conclusions on the full compliance of existing probabilistic safety indicators with target benchmarks (regulatory requirements), taking into account the design number of safety systems.

At present, the implementation of the remaining activities of the National Action Plan continues. Thus, within the framework of the implementation of the activity “Creation of a Stationary Local Seismic Observation Network”, the necessary equipment has been purchased, the design of monitoring stations and the organization of the design review are being completed, after which it is planned to construct and commission a stationary local seismic monitoring network.

Within the framework of the implementation of additional measures under the item “Conduct an assessment of the feasibility of increasing the seismic resistance category of the fire station building, taking into account the possibility of involving the forces and means of the Fire Department-2 to overcome the seismic barrier during the maximum design earthquake with the development of proposals to improve design safety” and the item “Conduct the necessary organizational and technical measures based on the assessment performed under item d1”, a preliminary analysis of the feasibility of increasing the seismic resistance category of the fire station building has been performed. The planned completion date for the above activities is December 31, 2027.

6 (b) Program for maintaining and improving the safety of the Belarusian NPP

According to the Decree of the President of the Republic of Belarus [2.17], in 2021, the Belarusian NPP for the first time formed and developed the Program for maintaining and improving the safety of the Belarusian NPP for the entire operating lifetime of power units No. 1 and 2 (hereinafter referred to as the Program). The main areas for maintaining and improving the safety of the NPP are defined as:

scientific support for maintaining and improving the safety of the NPP;

implementation of work to improve the nuclear, radiation, fire, industrial and environmental safety of the NPP;

implementation of work aimed at improving the safety of the NPP associated with changes in national requirements and international obligations;

financing the costs of spent nuclear fuel management after its delivery to the storage facility;

maintenance and improvement of the system for management of radioactive waste generated during the operation of the NPP, the system for management of spent nuclear fuel of the NPP, the security system of the NPP and the emergency preparedness and response system;

siting, design and construction of storage (disposal) facilities for radioactive waste, spent nuclear fuel generated during the operation of NPPs (including storage accumulation sites);

ensuring the disposal (long-term storage) of radioactive waste, returned waste from the reprocessing of spent nuclear fuel generated during the operation of nuclear power plants;

modernization of systems and equipment, introduction of new equipment to maintain and improve the safety of NPPs;

acquisition and modernization of calculation and analytical complexes and software for performing NPP safety assessments;

formation and replenishment of the repair (insurance) stock of SE “Belarusian Nuclear Power Plant”.

Since 2021, as part of the implementation of the Program, a number of measures have been carried out aimed at maintaining and improving the safety of the NPP. Examples of the most significant measures that have been implemented to date are: “Development of technical and organizational measures to ensure restoration of water supply within the time required to prevent severe accidents occurring in an open reactor in the event of loss of external and emergency power supply to the power unit”, “Modernization of the automated system for accounting and control of nuclear materials in terms of accounting for small quantities of nuclear materials”, “Ensuring calibration and performance testing of human radiation spectrometers using a phantom”, “Creation of a cybersecurity center”, etc.

In 2023, the modernization of the full-scale simulator was completed (equipment delivery, installation work to bring the control center, panels and consoles of the technical means of operational and dispatch control of the FSS into compliance, software was modified, work was performed to verify the mathematical model and acceptance tests were carried out). Completion of work on periodic confirmation of compliance of the FSS and the MCR is planned for December 2025. Implementation of the measures of the Program for maintaining and improving the safety of the NPP for the period of operation of power units No. 1, 2 of the Belarusian NPP makes it possible to maintain the FSS configuration at the level of the actual state of the MCR of the prototype power unit.

The implementation of strategic tasks in the areas of maintaining and improving the safety of NPPs is an iterative process and makes it possible to implement specific measures, the need for which arises during the operation of the NPP. The need to implement these measures, among other things, depends on the results of the operation of power units, the development of regulatory requirements, scientific and technological progress, the obsolescence of equipment and systems, etc. At least once a year, the Program is updated and supplemented with new measures aimed at maintaining and improving the safety of the NPP. Thus, the implementation of the Program ensures safe and reliable operation of the power units of the Belarusian NPP.

Summary of significant changes since previous National Report

In October 2023, amendments were made to the license of the State Enterprise “Belarusian NPP”, allowing the start of commercial operation of power unit No. 2 of the Belarusian NPP. The license for the operation of power unit No. 2 of the Belarusian NPP is valid until October 23, 2053. The decision to amend the license was based on the results of the safety review of documents justifying nuclear and radiation safety, and the results of control and supervisory activities carried out by Gosatomnadzor. Thus, both units of the Belarusian NPP are currently in operation.

According to the Decree of the President of the Republic of Belarus dated January 26, 2021 No. 32 “On the Funds of the Belarusian Nuclear Power Plant”, in 2021, the Belarusian NPP for the first time formed and developed a Program for maintaining and improving the safety of the Belarusian NPP for the operating lifetime of power units No. 1, 2.

At least once a year, the Program is updated and supplemented with new measures aimed at maintaining and improving the safety of the NPP, it allows accumulating funds for the implementation of long-term expensive measures. Thus, the implementation of the Program ensures the safe and reliable operation of the power units of the Belarusian NPP.

PART B: LEGISLATION AND REGULATION

Part B consists of 3 Articles:

ARTICLE 7 LEGISLATIVE AND REGULATORY FRAMEWORK

ARTICLE 8 REGULATORY BODY

ARTICLE 9 RESPONSIBILITY OF THE LICENCE HOLDER

ARTICLE 7. LEGISLATIVE AND REGULATORY FRAMEWORK

1. Each Contracting Party shall establish and maintain a legislative and regulatory framework to ensure the safety of nuclear installations.

2. The legislative and regulatory framework shall provide for:

i) the establishment of applicable national safety requirements and regulations;

ii) a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a licence;

iii) a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licences;

iv) the enforcement of applicable regulations and of the terms of licences, including suspension, modification or revocation.

Summary statement for Article

The Republic of Belarus fulfils the obligations stipulated by Article 7 of the Convention. The country has created and is constantly improving the legislative and regulatory framework for ensuring the safety of nuclear installations, which meets the requirements and recommendations of the IAEA.

In particular, the necessary regulatory requirements in the field of safety have been developed and implemented in the national legal field. On a systematic basis, an ongoing analysis of the enforcement of such requirements, their updating, as well as the development of new requirements is being carried out.

The licensing system for nuclear installations, taking into account the significance of nuclear and radiation safety issues, is removed from the general national licensing system for activities in the country and imposes increased requirements both for the organization of the licensing procedure and for the liability of licensees in the field of atomic energy use.

The regulatory body is empowered to verify compliance with both regulatory and licensing requirements without any restrictions on the number of such inspections, the format and duration of supervisory activities. The powers of the regulatory body are sufficient to suspend, amend or revoke licences in the field of nuclear energy use, as well as to change the terms of their validity.

7.0 Introduction

As a full member of the IAEA, the Republic of Belarus is guided by international requirements and recommendations established by the IAEA when improving its national legislation in the field of nuclear and radiation safety. The safety principles defined in the IAEA publication No. SF-1 “Fundamental Safety Principles”, as well as the main provisions of other IAEA safety standards are reflected in the Laws of the Republic of Belarus [2.2] and [2.1], the Resolution of the Government of the Republic of Belarus [3.1], as well as in other legislative acts. Commitment to ensuring safety in the use of atomic energy is enshrined in the Constitution of the Republic of Belarus [2.0], and “strict compliance with international rules and standards in the field of nuclear, radiation, industrial and environmental safety during the operation of the national NPP” is one of the elements of protection against threats to national security in accordance with the National Security Concept [2.19].

The Government declared the adoption of a global nuclear safety regime, commitment to the implementation of the nuclear power program in compliance with international conventions and treaties [1.1. – 1.19] through their adoption and ratification in the Republic of Belarus, as well as approval of the “Main Directions of Implementing the Unified State Policy in the Field of Nuclear and Radiation Safety” [3.1].

Notable achievement:

The Republic of Belarus actively uses all available tools to maintain the global nuclear safety regime. All the key IAEA missions recommended to newcomer countries have been accepted. The conduction of the IAEA Education and Training Appraisal mission (EduTA) is being prepared (scheduled for November 2025). Active interaction is underway at the regional level – initiatives are being proposed and promoted through the Council of Heads of Regulatory Authorities of the CIS Member States, created at the suggestions of the Belarusian side. In 2025, the Republic of Belarus joined the Technical Support Organizations Forum (TSOF). A new vector of bilateral cooperation is developing in the form of providing expert support to newcomer countries starting to implement nuclear power programs based on Russian designs.

7.1 Establishing and maintaining a legislative and regulatory framework for ensuring the safety of nuclear installations

The legislation in the field of nuclear and radiation safety has a hierarchical structure and is based on the principle of compliance of a legislative act of lesser legal force with the requirements of acts of greater legal force. The system of legislation in the field of nuclear and radiation safety includes:

laws of the Republic of Belarus;

decrees of the President of the Republic of Belarus;

resolutions of the Government of the Republic of Belarus;

regulatory legal acts of government bodies and state regulatory bodies in the field of ensuring safety in the use of atomic energy;

norms and rules for ensuring nuclear and radiation safety, as well as other technical regulatory legal acts in the field of atomic energy use.

The fundamental legislative act regulating the safety of atomic energy use is the Law of the Republic of Belarus “On Safety Regulation in the Use of Atomic Energy” [2.2], which comprehensively regulates public relations in the field of nuclear and radiation safety at all stages of the life cycle of nuclear facilities. The law was adopted on October 10, 2022 and entered into force on October 14, 2023, replacing the previously valid Law of the Republic of Belarus “On the Use of Atomic Energy”.

For reference:

The Law “On Safety Regulation in the Use of Atomic Energy” establishes definitions of terms in the field of nuclear and radiation safety (“life cycle of a nuclear installation and (or) storage facility, disposal facility”, “safety assessment”, “configuration management”, “nuclear security” and other terms), which will ensure uniform application of legislation by all sides of legal relations operating in the field of atomic energy use.

The IAEA recommended principles for safety in the use of atomic energy, which set the direction and lay the foundation for the correct adoption of management and regulatory decision, are established,

The functions of public administration and public regulation in the field of ensuring safety in the use of atomic energy are delimited.

The powers of republican bodies of state administration are clarified and specified, including with the aim of strengthening their responsibility in the designated area of activity.

The independence and powers of Gosatomnadzor in the implementation of state regulation in the field of ensuring safety in the use of atomic energy, including those corresponding to the provisions of Articles 7 and 8 of the Convention on Nuclear Safety and Articles 19 and 20 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, are clearly defined. The Law also contains provisions on the storage and disposal of radioactive waste, which separate the definitions of “storage facility” and “disposal facility” (in the previously effective Law of the Republic of Belarus “On the Use of Atomic Energy”, the general name “radioactive waste storage facility” was established). This approach makes it possible to *carry out legal regulation of such activities depending on the functional purpose of the radioactive waste management facility and the type of activity carried out in relation to it.*

In order to make informed decisions on issues of ensuring nuclear and radiation safety, a system of scientific and technical support for regulatory activities in this area has been formed.

It includes scientific and technical support organizations determined by the Government, the National Commission for the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus and experts.

The provisions on safety assessment, state supervision in the field of ensuring nuclear and radiation safety, licensing of activities in the field of using atomic energy, holding public discussions and hearings, issuing permits for the right to perform work and provide services in the field of using atomic energy and handling nuclear materials, emergency preparedness and response have been systematized.

In order to harmonize with modern international standards, the Law contains rules governing the responsibility of the licensee (operating organization) for ensuring the safety of activities when using atomic energy. As part of the consolidation of law-making initiatives and taking into account the commonality of the subject of legal regulation, the Law introduced amendments to other laws of the Republic of Belarus ("On Radiation Safety" and "On the Sanitary and Epidemiological Welfare of the Population"), and also declared the Law of the Republic of Belarus "On the Use of Atomic Energy" and individual provisions of the laws that introduced amendments to it to be no longer in force.

An important legislative act that determined the further development of the infrastructure for ensuring nuclear and radiation safety is the Resolution of the Government of the Republic of Belarus adopted on August 15, 2023 "On the Main Directions of Implementing a Unified State Policy in the Field of Ensuring Nuclear and Radiation Safety" [3.1]. The document legally enshrines the commitment of the Republic of Belarus to the fundamental safety principles defined in the IAEA publication No. SF-1 "Fundamental Safety Principles", and also formulates the directions for the further development of infrastructure elements that ensure nuclear and radiation safety. It is noted that the legislation on nuclear and radiation safety is placed in a separate branch of legislation in accordance with the Unified Legal Classifier of the Republic of Belarus. In general, as of August 2025, the regulation of public relations in the field of ensuring nuclear and radiation safety is carried out through 10 main legislative acts (laws of the Republic of Belarus, decrees of the President of the Republic of Belarus). In addition, the regulatory body has issued 78 legislative acts (including norms and rules for ensuring nuclear and radiation safety), establishing the relevant regulatory requirements, as well as 15 safety guides (of a recommendatory nature), and 72 regulatory documents of the vendor country have been recommended for use as reference.

<u>Notable achievement:</u>

The Republic of Belarus has fully formed a system of nuclear law based on the hierarchy of legal acts and a traceable relationship between regulatory norms of a general nature (contained in the main legislative acts) and technical norms contained in legal acts of the regulator and other interested government bodies. A separate branch of law is identified in the Unified Legal Classifier of the Republic of Belarus – "legislation on nuclear and radiation safety". In 2024-2025, at the request of the regulator, the scientific and technical support organization developed a system of codification and classification of regulatory requirements [4.39]. The measures taken make it possible to ensure regulation and management in the field of nuclear and radiation safety, including taking into account the potential expansion of the nuclear power program.

The Republic of Belarus has acceded to, ratified and implements activities within the framework of the following international treaties, agreements and conventions to which it is a party:

The Convention on Nuclear Safety, adopted in Vienna on June 17, 1994 (The Republic of Belarus acceded to the Convention by signing the Decree of the President of the Republic of Belarus dated September 2, 1998, No. 430) [1.4];

The Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, adopted in Vienna on September 5, 1997 (ratified by the Law of the Republic of Belarus dated July 17, 2002, No. 130-Z) [1.7];

Convention on Early Notification of a Nuclear Accident, adopted in Vienna on September 26, 1986 (ratified by the Decree of the Presidium of the Supreme Soviet of the Republic of Belarus dated December 18, 1986 No. 1216-XI) [1.1];

Convention on Assistance in the Case of a Nuclear Accident or Radiation Emergency, adopted in Vienna on September 26, 1986 (ratified by the Decree of the Presidium of the Supreme Council of the Republic of Belarus dated December 18, 1986 No. 1216-XI) [1.2];

Vienna Convention on Civil Liability for Nuclear Damage, adopted in Vienna on May 21, 1963 (ratified by the Law of the Republic of Belarus dated November 11, 1997 No. 76-Z) [1.5];

Convention on the Physical Protection of Nuclear Material, adopted on October 26, 1979 in Vienna (ratified by the Resolution of the Presidium of the Supreme Council of June 14, 1993 No. 2381-XП) [1.3] and the amendment to it, adopted at the Conference to consider amendments to the said Convention in Vienna on July 8, 2005 (ratified by the Law of the Republic of Belarus of May 5, 2023 No. 265-З);

Agreement of 14 April 1995 between the Republic of Belarus and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons [1.8].

The Republic of Belarus carries out multilateral and bilateral cooperation on issues of ensuring nuclear and radiation safety. Bilateral agreements have been concluded and are being implemented with the Russian Federation (the vendor country), as well as with Austria, Armenia, Hungary, Vietnam, Germany, Latvia, Lithuania, UAE, Poland, Slovakia, Slovenia, Turkey, Uzbekistan, Ukraine, France, and regulatory authorities of the Nordic countries (Norway, Sweden, Finland) [1].

7.2 Provisions of the legislative and regulatory framework

The regulatory control and assessment system is built in accordance with the IAEA requirements and recommendations. The corresponding assessments were obtained during the IAEA missions IRRS (2016) and the IRRS follow-up mission (December 2021).

7.2 (i) National safety requirements and regulations

The country has developed a regulatory framework that meets modern international requirements and is sufficient to ensure safety at all stages of the life cycle of nuclear facilities and ionizing radiation sources operating in the Republic of Belarus.

As part of improving the legislation on nuclear and radiation safety, from August 2022 to August 2025, five resolutions of the Council of Ministers of the Republic of Belarus were adopted and entered into force, namely:

1) Resolution of the Council of Ministers of the Republic of Belarus dated February 15, 2023 No. 128 “On the Strategy of Radioactive Waste Management” [3.3] that:

approves the Strategy of Radioactive Waste Management, which is a comprehensive program document that consolidates the main areas of activity for the safe and cost-effective management of radioactive waste;

2) Resolution of the Council of Ministers of the Republic of Belarus of August 15, 2023 No. 535 “On the Main Directions of Implementing a Unified State Policy in the Field of Ensuring Nuclear and Radiation Safety” [3.1] that:

defines the main directions of implementing a Unified State Policy in the field of ensuring nuclear and radiation safety, for the first time enshrining the term “nuclear legacy sites”, which, in accordance with the approaches of the International Atomic Energy Agency, include sites where nuclear materials and (or) nuclear technologies were previously used, as well as territories subject to radioactive contamination as a result of accidents at nuclear power plants. It also enshrines the fundamental principles of ensuring safety, including issues of ensuring safety in the handling of radioactive waste and spent nuclear fuel, and mechanisms for their implementation, including in the long term;

3) Resolution of the Council of Ministers of the Republic of Belarus No. 668 of October 9, 2023 “On the Implementation of the Law of the Republic of Belarus No. 208-Z of October 10, 2022 “On Safety Regulation in the Use of Atomic Energy” [3.2] that approves:

Disciplinary regulations of employees of operating organizations;

Provision on safety zones with a special legal regime in the territories adjacent to the Belarusian Nuclear Power Plant and the State Scientific Institution “Joint Institute for Power and Nuclear Research – Sosny” of the National Academy of Sciences of Belarus;

Regulation on the procedure for ensuring nuclear security;

Regulation on the procedure for organizing and maintaining the state system of accounting and control of nuclear materials;

Regulation on the procedure for the functioning of the state safeguards system;

Regulation on the procedure for developing an action plan to protect the population from a nuclear and radiation accident;

Regulation on the procedure for the formation and functioning of the system of scientific and technical support for regulatory activities in the field of nuclear and radiation safety and the list of scientific and technical support organizations;

Regulation on the specifics of conformity assessment of products for which technical requirements are established in the field of ensuring safety in the use of atomic energy, the processes of its development, design, survey, production, construction, installation, adjustment, operation (use), storage, transportation, sale, utilization and disposal;

Regulations on the National Commission for the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus;

4) Resolution of the Council of Ministers of the Republic of Belarus dated December 1, 2023 No. 862 “On Amending the Resolution of the Council of Ministers of the Republic of Belarus No. 558 of October 6, 2021” [3.7], which, taking into account changes in legislation and application practice, improved:

the procedure for monitoring the compliance of licensees with licensing legislation, licensing requirements and conditions for carrying out activities in the field of the use of atomic energy and ionizing radiation sources, including special licensing requirements and conditions – in terms of securing the possibility of attracting a wider range of specialists with specialized knowledge and experience in the field of science, technology and other areas of activity required to resolve issues arising in the implementation of licensing control;

the procedure for conducting a safety review in terms of adjusting the procedure for conducting a safety review in the field of the use of atomic energy and ionizing radiation sources for operating organizations;

5) Resolution of the Council of Ministers of the Republic of Belarus of March 7, 2024 No. 158 “On the Establishment of the State Commission for the Priority Site Selection for Radioactive Waste Disposal Facility Construction” [3.8]:

taking into account the planned construction of a radioactive waste disposal facility in the Republic of Belarus, the resolution regulates the creation of a state commission for the selection of a priority site for the construction of a radioactive waste disposal facility and approves the Regulation on it.

The development and updating of current technical requirements in the field of nuclear and radiation safety continues on a systematic basis. Thus, for the period from May 2021 to August 2025, 34 resolutions of the Ministry for Emergency Situations were issued. In total, over 50 norms and rules for ensuring nuclear and radiation safety were developed and approved during the construction and commissioning of the Belarusian NPP.

The development of technical regulatory legal acts is carried out by the regulator (if necessary, with the involvement of the TSO) on a planned basis (within the framework of annual Plans for the preparation of draft legal acts approved by the Head of Gosatomnadzor).

Improvement of the regulatory framework in the field of nuclear and radiation safety in the Republic of Belarus is carried out on the basis of a regular analysis of the need to develop new and (or) adjust existing RLAs of various levels, taking into account the IAEA recommendations.

This fact is evidence of compliance with principle 3 of the Vienna Declaration on Nuclear Safety of February 9, 2015: “National requirements and regulations **...** are to take into account the relevant IAEA Safety Standards and, as appropriate, other good practices as identified inter alia in the Review Meetings of the CNS.”

7.2 (ii) Licensing system

The nuclear facility licensing system contains all the necessary elements to ensure safety control, including a regulated procedure for submitting documents justifying safety to the regulatory authority, requirements for the composition and content of such documents, processes for conducting conformity assessments, safety assessments and public hearings before making decisions on issuing a license, as well as a system of subsequent control over the licensee for compliance with licensing legislation, licensing requirements and conditions, including special licensing requirements and conditions. To provide expert support to the regulator when making a decision on issuing a license, a system of scientific and technical support organizations has been formed in the country, and a register of experts is maintained. More detailed information is provided in Article 8 “Regulatory body.”

The following works (services) constitute licensed activities in the field of the use of atomic energy and ionizing radiation sources:

1. Operation, decommissioning of nuclear installations, storage facilities, closure of disposal facilities;
2. Use, processing, transportation, storage of nuclear materials, materials and facilities contaminated with transuranic elements, according to the list determined by the licensing authority;
3. Design, siting, construction of nuclear installations, storage facilities, disposal facilities;
4. Performance of works for operating organizations and provision of services to operating organizations (except for works and (or) services on elimination of defects (non-conformities) identified during the warranty period of nuclear installations, storage facilities, disposal facilities, carried out by organizations that have a special permit (license) from the vendor country), affecting the nuclear and radiation safety of nuclear facilities, according to the list of such works and services determined by the licensing authority;
5. Design and manufacture of process equipment for nuclear facilities according to the list determined by the licensing authority;
6. Operation and storage of sealed ionizing radiation sources classified as the first - third categories of ionizing radiation sources according to the degree of radiation hazard, including as part of radiation devices;
7. Operation of radiation devices with an accelerating voltage of over 100 kV, charged particle accelerators, X-ray mammography units;
8. Operation and storage of open ionizing radiation sources, work with which belongs to the I, II classes of work with open IRS;
9. Manufacture (production) of radioactive substances and (or) products based thereon, including their storage;
10. Processing, long-term storage and disposal of radioactive waste;
11. Performance of works for users of ionizing radiation sources and provision of services to users of ionizing radiation sources that may affect radiation safety, according to the list of such works and services determined by the licensing authority;
12. Design, construction, decommissioning of radioactive waste management facilities, except for nuclear energy use facilities;
13. Conducting safety review in the field of nuclear energy and ionizing radiation sources.

Performance of the above works and (or) services without a license or in violation of licensing requirements and conditions is an offense [2.6].

The licensing authority for activities in the field of the use of atomic energy and ionizing radiation sources is the Ministry for Emergency Situations. At the same time, the main licensing functions are assigned to the regulatory body.

The regulatory body:

accepts applications for the issuance of a license, amendments to it, extension of the term, renewal, termination of a license and the documents attached thereto;

conducts a conformity assessment, appoints a safety review;

based on the volume of submitted documents, sets the deadlines for the conformity assessment and safety review;

based on the results of consideration of received documents, the conformity assessment and safety review, develops draft decisions on licensing issues;

drafts and issues licenses signed by the Head of Gosatomnadzor;

ensures that information on issued licenses is entered in the Unified Register of Licenses;

exercises control over the compliance of licensees with licensing legislation, licensing requirements and conditions, including special licensing requirements and conditions;

issues demands (orders) to licensees to eliminate identified violations of licensing legislation, licensing requirements and conditions, including special licensing requirements and conditions;

forms a commission on licensing activities in the field of the use of atomic energy and ionizing radiation sources, establishes the procedure for its activities and powers.

In addition, the regulatory body is responsible for organizing and holding public hearings at the stage of making a decision to issue a license to an operating organization for siting, construction, operation of a nuclear installation, storage facility, disposal facility, decommissioning of a nuclear installation, storage facility, closure of a disposal facility. The procedure for holding public hearings is determined by the Government of the Republic of Belarus [3.10].

According to [2.2], legal entities and individuals have the right to propose their representatives to participate in state and other reviews of a nuclear installation and (or) storage facility, disposal facility at the stage of their siting, design, construction, operation, limitation of operational characteristics or decommissioning of a nuclear installation and (or) storage facility, closure of a disposal facility.

7.2 (iii) System of regulatory inspection and assessment

The system of regulatory inspection and assessment is built in accordance with the requirements and recommendations of the IAEA. The corresponding assessments were obtained during the IAEA missions (IRRS (2016) and the IRRS follow-up mission (December 2021).

Elements of regulatory inspection and assessments are enshrined in the Law of the Republic of Belarus [3.2], Government resolutions [3.6, 3.6] and Gosatomnadzor instructions. The main such elements are:

a system of state inspectors for nuclear and radiation safety with the appropriate powers;

a system of documented procedures (forms, methods, planning and reporting) for implementing supervisory actions and law enforcement measures;

a permanent supervision mode at nuclear facilities;

a graded approach to the implementation of supervisory activities, including a risk-based method for assessing the safety indicators of the Belarusian NPP.

Thus, based on the IAEA approaches, the regulatory body has introduced into practice 3 main forms of state supervision in the field of nuclear and radiation safety, as well as licensing control. These forms include:

inspection – assessment of compliance by the inspected entities with the legislation on nuclear and radiation safety, the conditions of validity of permits, compliance with the requirements (orders) of the regulatory body with a visit to the site to conduct a visual inspection of the inspected entity, objects in its circulation and the activities carried out with them on site, interviewing responsible officials and personnel, studying documents confirming compliance with certain established requirements. The inspection can be scheduled, unscheduled, in the mode of permanent state supervision;

systematic monitoring and analysis of compliance by the inspected entities with the legislation on nuclear and radiation safety, the conditions of validity of licenses (permits) – an assessment of compliance with the established requirements based on an analysis of the results of inspections and other supervisory activities carried out by the regulatory body, as well as an analysis of documents submitted by the inspected entity to the regulatory body. Such documents may contain both information on compliance with the established safety requirements and information on organizational or technical solutions planned for implementation at supervised facilities. Such an analysis does not require a visit to the site of the Belarusian NPP. Given the large number of documents received by the regulatory body, such work is carried out on a permanent basis;

preventive and precautionary measures – systematically conducted work aimed at communicating and explaining the established safety requirements, as well as timely informing the operating organization about the prerequisites for violating the established requirements at supervised facilities.

Inspections in the permanent supervision mode are carried out by state nuclear and radiation safety inspectors of the Division of Nuclear and Radiation Safety Supervision of Gosatomnadzor, located directly at the site of the Belarusian NPP. The Division's employees (6 persons) carry out supervisory activities on a daily basis, and, if necessary, during non-working hours, in accordance with monthly plans for inspections in the permanent supervision mode.

To provide scientific and technical support for regulatory assessments, the CNRS operates within the Ministry for Emergency Situations. This institution has the authority to coordinate all scientific and technical support organizations for the regulatory body.

The regulatory body evaluates all aspects of the operating organization's activities that may affect nuclear and radiation safety, including:

technical aspects – readiness and condition of process equipment, safety systems;

organizational and technical aspects – organization of work on process equipment and safety systems, directly with IRS, as well as direct control over such work;

organizational aspects – enterprise management systems and quality management systems (in terms of ensuring nuclear and radiation safety with such systems);

personnel training systems; measures to form and maintain safety culture; leadership of managers in safety matters.

State supervision in the field of nuclear and radiation safety for the Belarusian NPP – the main subject of supervision, was carried out in accordance with the Basic and General Supervision Programs at NPPs during the operational stage.

The Basic Supervision Program for NPP was implemented in December 2021. Due to the transition of the Belarusian NPP to the operational stage in the reporting period, the Basic Supervision Program was updated. Currently, the program includes 4 thematic areas and 10 thematic directions of supervision in relation to the NPP. The thematic directions include: NPP design management; ensuring operational safety and taking into account operating experience; radiation safety; radioactive waste management; emergency preparedness and response; physical protection; accounting and control of nuclear materials; operating organization management system for safety; safety culture and leadership; personnel training system.

Based on the Basic Supervision Program, a system of General Supervision Programs has been developed, detailing the forms, methods, thematic issues and the frequency of their assessments for each of the thematic directions listed above.

Safety assessments are carried out by the regulatory body:

based on the results of a periodic safety assessments of a nuclear installation and (or) storage facility, disposal facility, carried out by the operating organization;

when changing the configuration of a nuclear installation and (or) storage facility, disposal facility, including during reconstruction, modernization, modification associated with a change in configuration;

within the framework of state supervision in the field of ensuring nuclear and radiation safety;

after violations in the operation of a nuclear installation and (or) storage facility, disposal facility associated with the failure of systems and elements important to safety, or erroneous actions of workers.

As part of the safety assessment, Gosatomnadzor, if necessary, appoints a safety review and (or) organizes the receipt of consulting services.

The procedure for conducting a review of documents justifying the provision of nuclear and radiation safety in the implementation of activities in the field of the use of atomic energy and IRS has been approved by the Government of the Republic of Belarus [3.6].

Safety review is carried out by expert organizations licensed to perform work and (or) provide services for conducting safety review.

In accordance with the Decree of the President of the Republic of Belarus [2.7], for applicants represented by operating organizations, safety review is carried out by the CNRS as part of the procedure for licensing activities in the field of the use of atomic energy and ionizing radiation sources. Given the increased danger of nuclear facilities, this approach is the most appropriate and justified and allows to ensure safe operation of such facilities, including through prompt implementation of a comprehensive safety review, and also meets the requirements of the IAEA, according to which the expert organization should not depend on the operating organization when preparing the conclusion, i.e. the review should be independent. Considering that the CNRS is an organization subordinate to the Ministry for Emergency Situations, the IAEA requirements are met.

Foreign organizations that are scientific and technical partners of the vendor country, do not have a license in the Republic of Belarus, and are capable of providing a comprehensive, effective and high-quality safety review may be involved in conducting the safety review (provided that the experts of this organization have the appropriate access to restricted information (if necessary) in accordance with the legislation on information, informatization and information protection).

Gosatomnadzor posts a register of experts in the field of nuclear and radiation safety on its official website on the global computer network Internet.

The safety review is considered complete after Gosatomnadzor has notified the applicant and the expert organization in writing of the acceptance of the expert opinion.

More detailed information regarding regulatory assessments and safety verifications is provided in Article 14.

<u>Challenge based on the results of the 8th and 9th Joint Meeting of the Contracting Parties</u>

“Safe operation of Units 1 and 2 of the Belarusian NPP after successful completion of their trial operation period, as well as licensing and supervision of the construction of Unit 2 of the Belarusian NPP and with assuring that the VDNS principle 1 is met.”

Principle 1 of the Vienna Declaration on Nuclear Safety stipulates that “New nuclear power plants are to be designed, sited, and constructed, consistent with the objective of preventing accidents in the commissioning and operation and, should an accident occur, mitigating possible releases of radionuclides causing long-term off site contamination and avoiding early radioactive releases or radioactive releases large enough to require long-term protective measures and actions.”

The Republic of Belarus has taken comprehensive measures to improve the licensing and regulatory supervision system to ensure their efficiency and effectiveness during the operation of the Belarusian NPP. The Belarusian regulator has ensured licensing of NPP personnel and established an appropriate mechanism for monitoring compliance with the terms and conditions of such licenses (personal permits). Detailed information on the changes made is provided in subsections 7.2 (iii) and 7.2 (iv)) of Article 7. All necessary regulatory requirements for ensuring NPP safety have been established and are monitored, including requirements for safety management systems, safety culture, equipment configuration management, etc. The structure of the OO contains all elements envisaged by the design and justified in the Safety Analysis Report, including internal supervision units in the OO. The relevant information is provided in various chapters of this report. The regulatory body has carried out an appropriate redistribution of its own resources. The system of scientific and technical support of the regulatory body has been significantly improved. Detailed information is provided in Article 8. Information on the site selection, taking into account principle 1 of the Vienna Declaration, has been provided in previous National Reports and is also provided in Article 17.

7.2 (iv) Enforcement of applicable regulations and terms of licenses

In accordance with the Decree of the President of the Republic of Belarus [2.15], Gosatomnadzor, in accordance with the tasks assigned to it, exercises control over the compliance by licensees with the licensing legislation, licensing requirements and conditions for carrying out activities in the field of the use of atomic energy and ionizing radiation sources, including special licensing requirements and conditions.

Licensing control is carried out in accordance with the Decree of the President of the Republic of Belarus [2.7] in the manner established by the Government Resolution [3.6].

If Gosatomnadzor identifies a violation by a licensee of the licensing legislation, licensing requirements and conditions:

not eliminated at the time of its detection or during the inspection, Gosatomnadzor, within 15 working days from the date of detection of the violation, issues a demand (order) to the licensee to eliminate the identified violation and sets a period for its elimination, which may not exceed six months. Simultaneously with the issuance by Gosatomnadzor of a demand (order) to eliminate the identified gross violation, the licensing authority has the right to suspend the license until it is eliminated, but for no more than six months;

committed by the licensee within 12 months after the submission of a notice of elimination of a similar violation, Gosatomnadzor has the right to take one of the above decisions or terminate the license in the manner prescribed by law.

Gross violations according to the law [2.7] are:

violation of established technological regulations, technological processes, instructions and programs that could lead or led to an incident, accident, nuclear or radiation accident and the emergence of an immediate threat to the life or health of people and (or) the environment;

violation of the limits and conditions for the safe operation of a nuclear installation, storage facility, disposal facility, ionizing radiation source, established in the documents justifying safety;

failure to submit, untimely submission, or submission by the licensee of incomplete or inaccurate information on the changed safety status of the nuclear facility, as well as concealment of information on the violation of the limits and conditions for the safe operation of the nuclear facility or untimely notification of Gosatomnadzor of such a violation, regardless of its consequences;

conducting reconstruction, modernization of the nuclear facility without making appropriate changes to the approved design and without assessing the safety of the licensing authority for the results of making changes and (or) deviation from the approved design during the reconstruction, modernization of the nuclear facility, regardless of the consequences of such violations;

unjustified change in the established terms and scope of periodic operational inspection of equipment and systems of nuclear facilities;

untimely replacement of equipment that has exhausted its operating liferime during the operation of the nuclear facility;

performance of work and (or) services by employees who do not meet the requirements of the legislation;

operation of an ionizing radiation source, the type of which is subject to state registration, but is not included in the State Register of Types of Ionizing Radiation Sources of the Republic of Belarus (except for ionizing radiation sources used in technological processes of a nuclear power plant in accordance with the design, engineering and technological documentation);

operation, storage of radiation devices containing sealed ionizing radiation sources, the radiation and (or) technical condition of which does not meet the requirements of mandatory technical regulatory legal acts in the field of radiation safety and (or) technical (operational) documentation, operation of devices generating ionizing radiation, the technical condition of which does not meet the requirements of mandatory technical regulatory legal acts in the field of radiation safety;

performance of work and (or) services not specified in the license;

violation of special licensing requirements and conditions.

In 2023, the Regulation on the procedure for implementing licensing control [3.6] was updated in terms of introducing requirements on the possibility of involving experts and specialists, including from other countries, in licensing control, and the conditions for involving these experts were determined.

Licensing control is carried out in the form of scheduled and unscheduled inspections, systematic monitoring and analysis of compliance by licensees with licensing legislation, licensing requirements and conditions, as well as the implementation of preventive measures aimed at preventing violations of licensing legislation, licensing requirements and conditions by licensees.

Preventive measures during licensing control, in particular, include explanatory work on the procedure for complying with licensing legislation, licensing requirements and conditions, sending licensees proposals to improve the sustainability of the safe operation of nuclear facilities and radiation facilities.

If violations of current legislation are identified during licensing control, an inspection report is drawn up based on the results of the inspection.

The inspected entity has the right to appeal against the decisions of supervisory authorities on the act of inspection, as well as against the requirements to eliminate violations, actions or inactions of inspectors.

Based on the facts of the violations identified, the licensee may be brought to administrative responsibility [2.6].

Summary of significant changes since previous National Report

Since the publication of the previous National Report in 2022, the main legislative acts have been updated (taking into account the transition of the Belarusian NPP to the operational stage), and the relevant Government Resolutions have been issued (updated), including in terms of:

improvement of safety review procedures;

improvement of the system of licensing control and state supervision in the field of nuclear and radiation safety carried out by the regulatory body;

updating the system of supervision programs of the regulatory body in relation to the Belarusian NPP;

updating the internal procedures of the regulatory body related to the implementation of state supervision and licensing control;

updating the graded approach to the implementation of supervisory activities, including the introduction of risk-oriented methods for assessing the safety indicators of the Belarusian NPP in the context of supervisory activities.

ARTICLE 8. REGULATORY BODY

1. Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 7, and provided with adequate authority, competence and financial and human resources required to fulfil its assigned responsibilities.

2. Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy.

Summary statement for Article

The Republic of Belarus fulfils the obligations provided for in Article 8. The country has created and is constantly developing a regulatory body. The regulatory body is vested with the relevant powers, including the performance of all functions stipulated by the IAEA requirements and recommendations. The country has created and is developing a system of support for the regulatory body from the scientific and expert community. Future challenges are regularly considered and timely measures are taken to address them. The regulatory body has retained resources and activities in response to the development of the radioactive waste management infrastructure, as well as the expansion of the functions of the regulatory body related to nuclear legacy sites of Chernobyl origin.

The functions of regulation and management of projects related to the use of atomic energy are separated. The regulatory body has sufficient independence in making decisions on nuclear and radiation safety issues at nuclear facilities.

8.1 Establishment of the regulatory body

In order to implement regulatory functions in the field of nuclear and radiation safety, Gosatomnadzor, a separate structural division with the rights of a legal entity, was created in 2007 within the structure of the Ministry for Emergency Situations, its tasks and functions are set out in the Law of the Republic of Belarus [2.2] and the Regulation on the Department for Nuclear and Radiation Safety of the Ministry for Emergency Situations of the Republic of Belarus, approved by the Decree of the President of the Republic of Belarus [2.15].

Gosatomnadzor carries out special functions (executive, supervisory, regulatory and others) in the areas of nuclear and radiation safety, overcoming the consequences of the disaster at the Chernobyl nuclear power plant.

In accordance with the tasks and functions enshrined in legislation, Gosatomnadzor:

analyses the accumulated experience of applying legislation on nuclear and radiation safety, as well as in the sphere of overcoming the consequences of the disaster at the Chernobyl nuclear power plant and makes proposals for its improvement;

organizes the preparation of regulatory legal acts, including technical regulatory legal acts (norms and rules for ensuring nuclear and radiation safety, containing regulatory requirements);

develops draft decisions on issuing or refusing to issue a license, making or refusing to amend it, extending or refusing to extend the term, suspending, renewing, terminating or revoking the license based on the results of reviewing the received documents, conducting a conformity assessment and safety review, draws up and issues licenses signed by the Head of Gosatomnadzor and certified by the official seal of Gosatomnadzor;

issues permits for the right to carry out work in the implementation of activities in the field of the use of atomic energy and for the implementation of educational programs for advanced training of specialists in nuclear and (or) radiation safety;

carries out licensing control;

organizes and carries out state supervision in the field of ensuring nuclear and radiation safety, including ensuring physical protection, accounting and control of nuclear materials;

conducts safety assessment;

participates in the formation and functioning of the unified state system of personnel training;

exercises control over emergency preparedness;

coordinates activities in the field of radioactive waste management;

ensures the functioning of the state system of accounting and control of nuclear materials;

carries out, in accordance with international agreements of the Republic of Belarus, the exchange of information and cooperation with regulatory authorities of other states and international organizations;

ensures, with the involvement of interested parties, the fulfilment of the international obligations of the Republic of Belarus arising from the provisions and procedures of the Convention on Nuclear Safety, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management;

performs the functions of the state regulatory body in the field of ensuring safety in the use of atomic energy in accordance with Articles 7 and 8 of the Convention on Nuclear Safety and Articles 19 and 20 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management;

acts as a contact point on issues related to the fulfilment of the international obligations of the Republic of Belarus in the field of ensuring the physical protection of nuclear material and nuclear facilities;

determines the main areas of research and development in the field of ensuring nuclear and radiation safety;

organizes the work of the scientific and technical expert council in the field of nuclear and radiation safety;

organizes the implementation of scientific research work to improve the nuclear and radiation safety of nuclear facilities;

determines the need for expert support for its activities;

establishes the procedure for the formation and ensures the maintenance of a register of experts in the field of nuclear and radiation safety;

ensures the creation of appropriate mechanisms and procedures for informing stakeholders, as well as for consulting with them regarding regulated activities, including incidents, accidents and disruptions to the normal operation of nuclear facilities;

organizes and conducts public hearings;

ensures the formation and organizes the functioning of the scientific and technical support system;

exercises other powers in accordance with the legislation.

<u>Challenge based on the results of the 8th and 9th Joint Meeting of the Contracting Parties</u>

“Belarus should have enough resources for the full scope implementation of the regulatory oversight onsite taking into account subsequent development of the radioactive waste infrastructure, that includes newly established organization for operating radioactive waste disposal facility, as well as the expansion of the RB`s functions connected with the Chernobyl origin nuclear legacy sites.”

The challenge is closed.

In order to ensure comprehensive and effective performance of regulatory functions, taking into account the development of the nuclear power program, the emergence of new tasks and challenges, the staffing structure of Gosatomnadzor has changed since 2022. Figure 8.1 shows the current organizational structure of Gosatomnadzor. At the same time, due to the transition to operation of power units of the Belarusian NPP, new tasks related to the regulation of activities in the field of overcoming the consequences of the disaster at the Chernobyl NPP, long-term plans for the construction of nuclear facilities, a comprehensive solution to the issues of financial and economic support for activities, including within the framework of the implementation of state programs and the development of new union programs, a corresponding optimization of the structure was initiated in 2025. In particular, the regulator's unit responsible for regulatory supervision of nuclear safety of nuclear facilities will be strengthened. A separate structure – a division – will include a unit that will provide regulatory oversight of aspects of safety culture, consideration of human and organizational factors, integrated management systems for safety purposes (more details are provided in Article 12). In addition, a separate division – the Division of Strategic Development, Information and Scientific and Technical Support, consisting of 6 employees, will be created to ensure the strategic development of the regulator in the face of new challenges, coordination of the provision of scientific and technical support to Gosatomnadzor divisions by scientific and technical support organizations, as well as general coordination of the further development of the national infrastructure for ensuring nuclear and radiation safety. The introduction of the new structure is expected from November 1, 2025.

In addition, during the reporting period, the system of scientific and technical support for regulatory activities in the field of nuclear and radiation safety was significantly improved, including the creation of the National Commission for the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus [3.2], as well as a number of other measures, which is assessed by the Republic of Belarus as a significant achievement.

<u>Notable achievement:</u>

The Republic of Belarus has significantly improved the system of scientific and technical support for regulatory activities in the field of nuclear and radiation safety. The system of organizations providing scientific and technical support and their tasks have been revised. The National Commission for the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus [3.2] has been established as an independent high-level scientific and expert advisory body providing expert support in making key decisions on issues related to ensuring nuclear safety (a similar commission was established earlier to support decision-making on key issues of radiation safety). The Center for Nuclear and Radiation Safety of the Ministry for Emergency Situations of the Republic of Belarus is responsible for coordinating the entire scientific and technical support system, which includes 18 scientific, educational and other institutions. The interaction between the regulator and the Center is formalized by the relevant internal documents (regulations) to increase the efficiency of receiving the relevant support by the regulator's divisions. For the further development of the scientific and technical support system, financial instruments have been formed in the form of three State Programs with a validity period of 2026-2030 (at the time of preparation of this Report, procedures for their formalization by the Government resolutions are underway):

State scientific and technical program “Innovative and Digital Technologies for Emergency Protection” for 2026-2030 (subprogram 2 “Nuclear and radiation safety”);

State program “Science for the Economy and Society” for 2026-2030;

State program “Population Safety Infrastructure for 2026-2030” (subprogram 2 “Radiation safety”).

These decisions have significantly improved the efficiency and effectiveness of providing scientific and technical support to the regulator in matters of nuclear and radiation safety.

The resources currently available to the regulatory authority are sufficient to ensure regulatory functions in relation to all supervised entities in the country.

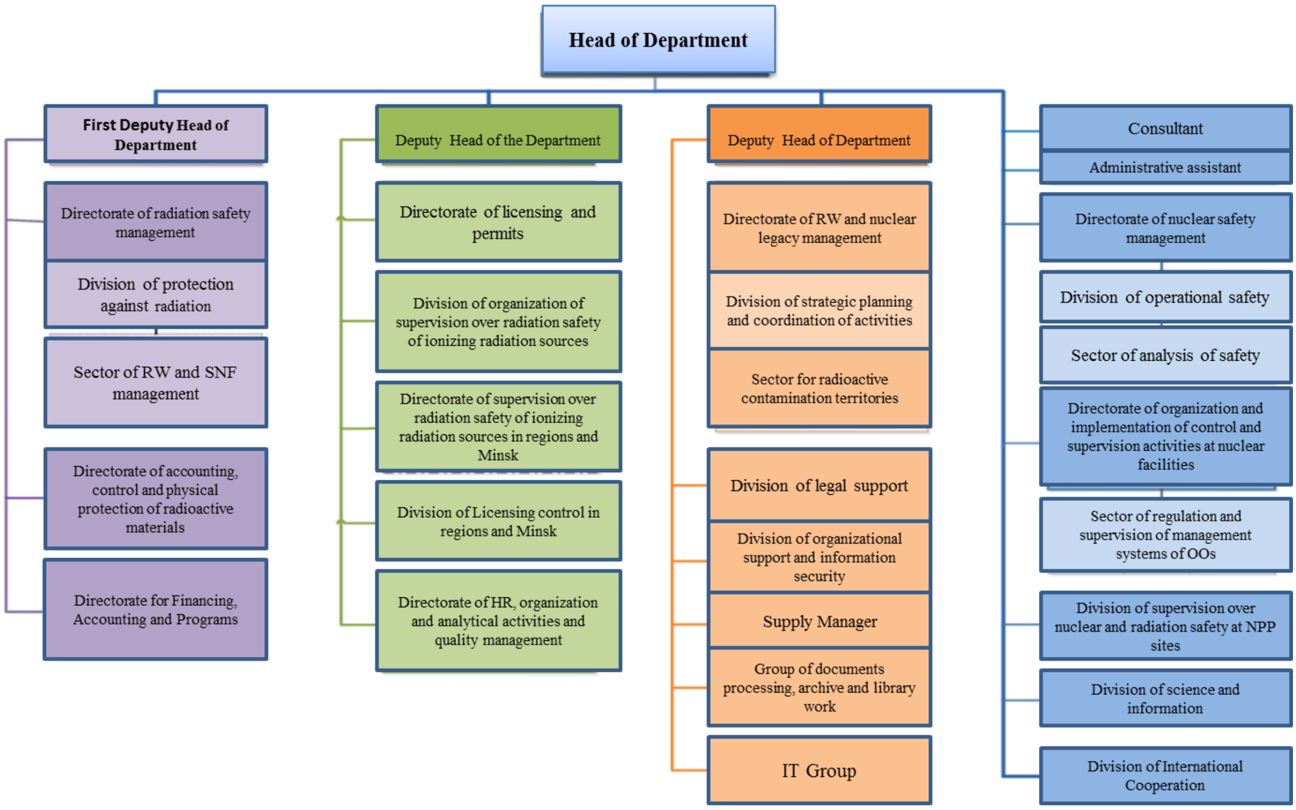

Figure 1. Organizational structure of Gosatomnadzor

The integrated management system of Gosatomnadzor, based on the process approach, was developed in accordance with the tasks and functions of Gosatomnadzor, certain requirements of the legislation of the Republic of Belarus, is assessed and constantly improved, allowing for the effective and efficient performance of regulatory functions, including in terms of developing and maintaining safety culture at the proper level. The principles and attributes of the safety culture of Gosatomnadzor are enshrined in the Regulation on the IMS.

The distribution of resources in solving the tasks assigned to Gosatomnadzor is based on such aspects as significance for safety, and is commensurate with the complexity of the activity and the associated radiation risks and the ability to control them.

Financing of the activities of Gosatomnadzor is provided from the state budget and other sources in accordance with the legislation, regardless of the financial resources of organizations or bodies responsible for the promotion or application of nuclear or radiation technologies.

Funding is annually justified and requested from the national budget for activities related to nuclear and radiation safety to ensure the activities of Gosatomnadzor (salaries of employees, travel expenses, purchase of equipment and software, etc.), as well as funding for expert and advisory assistance, organization of scientific work, professional training and advanced training of employees. Additional national instruments are used to provide scientific and technical support, as well as advanced training of specialists of the regulatory body:

Subprogram 8 “Training of personnel for nuclear power” of the State Program “Education and Youth Policy” for 2021-2025;

Subprogram 3 “Scientific support for the efficient and safe operation of the Belarusian NPP and prospective areas of nuclear energy development” of the State Program “High technologies and Equipment” for 2021-2025;

Annex 2 of the State Program for Overcoming the Consequences of the Chernobyl Disaster for 2021-2025.

At present, the regulatory authority has a sufficient number of competent and qualified employees, proportionate to the nature and number of installations and the volume of activities, for the effective and efficient implementation at the appropriate time of all relevant activities in safety-related areas. The total number of staff is 99 units (as of June 2025), most of which are related to the regulation of activities in the areas of nuclear and radiation safety, overcoming the consequences of the Chernobyl disaster. Currently, Gosatomnadzor employs 4 PhDs. In order to create a personnel reserve, Gosatomnadzor has been developing successful cooperation with specialized universities (BSU, BNTU, BSUIR) for many years, including organizing student internships. Based on the results of the internship, the best graduates are given the opportunity to work in Gosatomnadzor.

The qualifications of the regulatory authority's specialists are maintained within the framework of the implementation of the personnel policy and the current set of planned training activities, including the organization of international fellowships on a permanent basis.

In addition, Gosatomnadzor uses the human resources of the system of scientific and technical support organizations for regulatory activities; competent organizations of the vendor (the Russian Federation) are involved in providing consulting services, as necessary.

To make informed decisions on the issues of ensuring nuclear and radiation safety, Gosatomnadzor, when reviewing design documentation, other documents justifying nuclear and radiation safety of nuclear facilities, and the results of safety analysis, involves the scientific and technical support organizations.

The scientific and technical support system includes 18 scientific and technical support organizations determined by the Council of Ministers of the Republic of Belarus from among research, scientific and practical centers, academic institutes, the National Commission for the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus, which is an advisory scientific and expert body on nuclear safety issues (the Regulation on the Commission was approved by the Resolution of the Council of Ministers of the Republic of Belarus. Information on the work it has carried out is annually submitted to the Government [3.2]), experts included in the register of experts in the field of ensuring nuclear and radiation safety.

Scientific and technical support organizations are involved in safety review, provide expert and consulting services, and participate in scientific research aimed at increasing the level of nuclear and radiation safety in the implementation of activities in the field of atomic energy use.

Gosatomnadzor provides assistance to scientific and technical support organizations and experts in terms of advanced training.

Notable achievement:

The Republic of Belarus has organized close cooperation with the vendor country on scientific, technical and other support for regulatory and supervisory activities on both sides. Joint meetings of scientific and technical councils of regulators of the two countries have been organized – the first meeting was held on September 11, 2024. During such meetings, thematic areas of scientific work related to the development of regulatory requirements are determined, decisions are made on organizing joint events aimed at exchanging experience. It is planned to start conducting pilot joint scientific research on topics that are relevant for the two regulators. Memoranda of understanding on cooperation in the field of nuclear and radiation safety have been signed between the Belarusian regulator and key organizations of the Rosatom State Corporation. The memoranda allow the Belarusian regulator to promptly exchange experience on various aspects of nuclear and radiation safety (including receiving information on new technologies in the field of nuclear energy), which allows for the timely publication of relevant regulatory requirements within the framework of the “proactive regulation” approach. In addition, the memoranda allow the regulator to train its employees (especially those newly appointed to positions in the regulator) in organizations of the Rosatom State Corporation system. On the part of the regulator, as part of maintaining the global safety regime, the transfer of experience is ensured to regulators of newcomer countries in which Rosatom State Corporation is constructing NPPs using designs similar to the Belarusian NPP.

To ensure openness and transparency of the regulatory body's activities, Gosatomnadzor ensures that the public is informed about the state of safety of radiation facilities, nuclear installations, and nuclear power facilities.

As part of the implementation of the Information and communication strategy of Gosatomnadzor (the document contains a detailed description of target audiences, topics, forms and methods of communication, information flow diagrams), communication channels have been established and maintained (including the Internet resource of Gosatomnadzor https://gosatomnadzor.mchs.gov.by/), and interaction with the media has been organized.

Gosatomnadzor publishes in the public domain National Reports on the implementation of obligations under the Joint Convention, the Convention on Nuclear Safety, peer review reports, and other official documents.

Gosatomnadzor annually prepares and publishes activity reports that contain information on the state of safety in the country when using nuclear energy and ionizing radiation sources.

<u>Challenge based on the results of the 8th and 9th Joint Meeting of the Contracting Parties</u>

“Conducting public hearings on power unit No 2.”

On September 8, 2023, Gosatomnadzor held public hearings before issuing a license to operate power unit 2 of the Belarusian NPP. The event was held in a hybrid format. Participants were located in 4 studios (in Ostrovets, Minsk and Gomel) and also connected remotely (via videoconferencing). The event was observed by representatives of Belarusian universities that participate in the training of personnel for the nuclear industry, scientific organizations of the technical support system for regulatory activities, organizations involved in activities to overcome the consequences of the Chernobyl disaster, and foreign organizations from 12 countries related to the regulation of nuclear and radiation safety. In total, more than 200 people took part in the public hearings.

During the event, the public was shown that the upcoming decision to issue a license is justified and scientifically elaborated, including within the framework of the safety review and assessment of the compliance of the Belarusian NPP with licensing requirements and conditions. At the same time, the speakers covered the infrastructure aspects of the long-term implementation of the Belarusian nuclear power program. After the main reports, the participants in the hearings made 18 speeches with comments, during which they expressed their position on the essence of the issues discussed. Their topics concerned the functioning of the state radiation monitoring system, further support for the project both by scientific organizations of Belarus (Scientific Institution “JIPNR – Sosny”) and by engineering organizations of the Russian Federation, as well as promising areas of scientific research, development of the personnel training system, etc. As part of the public hearings, detailed answers to the questions received were presented, the information was taken into account when forming the terms of the license.

8.2 Status of the regulatory body

According to the Law of the Republic of Belarus [2.2, Article 15], Gosatomnadzor is the authorized state regulatory body in the field of ensuring safety in the use of atomic energy, as well as the regulatory body in accordance with the Convention on Nuclear Safety and the Joint Convention.

The scheme of the key state management and regulatory authorities involved into nuclear and radiation safety, the use of atomic energy in the Republic of Belarus is presented in Figure 8.2.

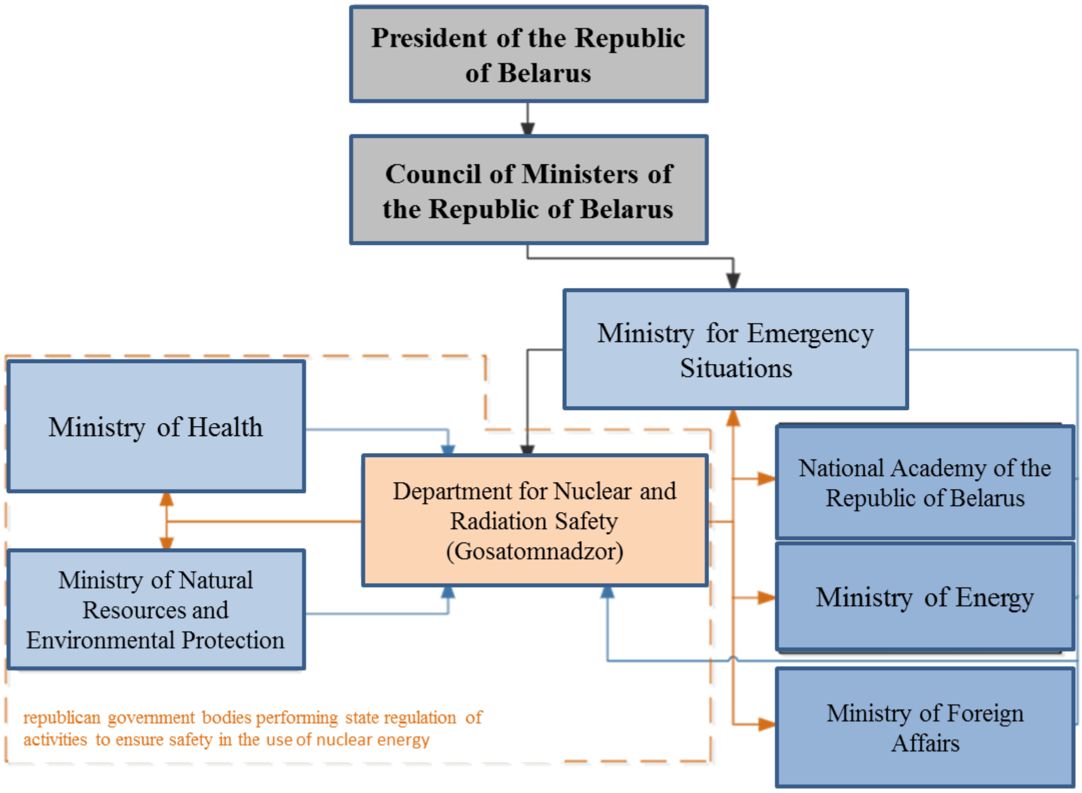

Figure 2. Scheme of key state management and regulatory authorities involved into nuclear and radiation safety, the use of atomic energy in the Republic of Belarus

8.2 (a) Independence of the regulatory body within the system of state bodies of the Republic of Belarus

The principle of independence of state regulatory bodies in the field of ensuring safety in the use of atomic energy when making decisions and exercising their powers as one of the principles of regulating safety in the use of atomic energy is enshrined in the Law of the Republic of Belarus [2.2, Article 4].

Gosatomnadzor performs regulatory functions in such a way as not to jeopardize its effective independence.

Gosatomnadzor is chaired by a Head appointed to the position and dismissed from the position by the President of the Republic of Belarus on the proposal of the Minister for Emergency Situations.

The Head of Gosatomnadzor reports to the Minister for Emergency Situations, manages the activities of Gosatomnadzor and is personally responsible for the performance of its tasks and functions.

When making regulatory decisions affecting safety, Gosatomnadzor is independent of the governing bodies in the field of ensuring safety in the use of atomic energy and IRS:

the status of the Chief State Inspector of the Republic of Belarus (Head of Gosatomnadzor), the rights of state inspectors who report directly to the Chief State Inspector are enshrined in law. Challenging (appealing) the decisions of the Chief State Inspector and state inspectors does not suspend their execution;

in accordance with the Regulation on State Supervision in the Field of Nuclear and Radiation Safety [3.5], Gosatomnadzor, when implementing state supervision in the field of nuclear and radiation safety, is granted the authority to include in inspection reports requirements that are mandatory for the supervised entities;

Gosatomnadzor is empowered to issue, within the limits of its competence, mandatory written orders to eliminate violations, including orders for full or partial suspension of activities related to the handling of IRS, RW, the use of atomic energy, the operation of IRS, radiation facilities, nuclear facilities, requirements (orders) to eliminate identified violations of licensing legislation, licensing requirements and conditions;

Gosatomnadzor sets the deadlines for the safety assessment and (or) review of the license applicant based on the volume of documents submitted by them to obtain a license;

decisions on licensing issues are made by the Board of the Ministry for Emergency Situations based on the conclusions of Gosatomnadzor;

the current legislation grants the regulatory body the right to amend the licensing requirements and conditions, information about which is specified in the license, including based on the results of supervision;

a system for applying administrative sanctions in case of violation of the requirements of the legislation and the requirements of regulatory documents on safety has been formed;

based on the results of supervision and other regulatory activities, Gosatomnadzor initiates consideration of issues at meetings of the National Commission for the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus, the National Commission for Radiation Protection under the Council of Ministers of the Republic of Belarus.

There are no organizations subordinate to Gosatomnadzor that carry out activities in the field of the use of atomic energy and IRS. Thus, a conflict of interest in terms of state regulation and management in the field of ensuring safety is excluded.

<u>Challenge based on the results of the 8th and 9th Joint Meeting of the Contracting Parties</u>

“Belarus should have enough resources for the full scope implementation of the regulatory oversight onsite taking into account subsequent development of the radioactive waste infrastructure, that includes newly established organization for operating radioactive waste disposal facility, as well as the expansion of the RB`s functions connected with the Chernobyl origin nuclear legacy sites.”

The challenge is closed.

In the reporting period, the organizational and staff reorganization of the regulatory body (Gosatomnadzor) was carried out, and the system of scientific and technical support for regulatory activities in the field of nuclear and radiation safety was improved. Resources are sufficient to perform the functions of regulatory supervision and control.

<u>Challenge based on the results of the 8th and 9th Joint Meeting of the Contracting Parties</u>

“*Conducting public hearings on power unit No 2.*”

The challenge is closed and is no longer relevant for the next reporting period. Public hearings were held on September 8, 2023.

Summary of significant changes since previous National Report

In the period from 2022 to 2025, the regulatory system for activities in the field of atomic energy and IRS use was strengthened. The legislation underwent significant changes, including the entry into force of the Law of the Republic of Belarus “On Safety Regulation in the Use of Atomic Energy” [2.2], which, among other things, legislatively enshrined the status of Gosatomnadzor as a state regulatory body in the field of ensuring safety in the use of atomic energy in accordance with Articles 7 and 8 of the Convention on Nuclear Safety and Articles 19 and 20 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

In 2023, the system of scientific and technical support for regulatory activities in the field of atomic energy use was significantly improved, including the newly created National Commission on the Safe Use of Atomic Energy under the Council of Ministers of the Republic of Belarus, which annually informs the Government about the work performed [3.2].

ARTICLE 9. RESPONSIBILITY OF THE LICENCE HOLDER

Each Contracting Party shall ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.

Summary statement for Article

The Republic of Belarus fulfils its obligations under Article 9. Responsibility for the safety of a nuclear installation is legally assigned to the operating organization. A system of control over the fulfilment of obligations to ensure safety by the operating organization has been created.

9 (a) Responsibilities of the operating organization

In accordance with Article 35 [2.2], the OO bears full responsibility for the safety of the nuclear installation, storage facility, disposal facility in all modes of operation, as well as for the proper management of nuclear materials and radioactive substances.

In the event of termination of the license, the OO continues to bear responsibility for the safety of the nuclear installation, storage facility, disposal facility until these facilities are transferred to another operating organization or until a new license is obtained.

In the event of decisions being taken in accordance with the established procedure to suspend, terminate, or cancel a license, the state authority for safety in the use of atomic energy or the state organization in whose jurisdiction the nuclear installation, storage facility, disposal facility is located shall take measures to ensure their safety. If the renewal of such a license is impossible, the relevant state authority for safety in the use of atomic energy or the state organization in whose jurisdiction these facilities are located shall take measures to create a new operating organization.

Monitoring of the operating organization's compliance with its obligations to ensure nuclear and radiation safety is carried out within the framework of two types of state supervision (control):

supervision in the field of ensuring nuclear and radiation safety;

monitoring of licensees' compliance with licensing legislation, licensing requirements and conditions for carrying out activities in the field of using atomic energy and ionizing radiation sources, including special licensing requirements and conditions.

More detailed information on the procedure for implementing the specified types of supervision (control) is provided in 7.2 (iii) and 7.2 (iv).

Summary of significant changes since previous National Report

On October 14, 2023, the Law of the Republic of Belarus “On Safety Regulation in the Use of Atomic Energy” came into force, replacing the previously effective Law of the Republic of Belarus “On the Use of Atomic Energy”. As noted above in the text, the Law (in addition to other changes) retains the norm on the full responsibility of the OO for the safety of a nuclear installation, and also details and expands the responsibilities of the operating organization in the field of ensuring safety in the use of atomic energy.

PART C: GENERAL SAFETY CONSIDERATIONS

Part C consists of 7 Articles:

ARTICLE 10. PRIORITY TO SAFETY

Each Contracting Party shall take the appropriate steps to ensure that all organizations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety.

Summary statement for Article

The Republic of Belarus fulfils its obligations under Article 10. The priority of safety over all other aspects of activity is legislatively enshrined both at the level of top-level legislative acts and at the level of regulatory requirements.

10 (a) Basic legal requirements

Article 46 of the Constitution of the Republic of Belarus establishes the standard for ensuring safety in the production of nuclear energy [2.0].

The principles for implementing activities on the use of atomic energy are defined in the new Law of the Republic of Belarus [2.2], including:

priority of protecting the life and health of the present and future generations of citizens, environmental protection over all other aspects of activities on the use of atomic energy;

ensuring that the benefits to citizens and society from the use of atomic energy exceed the harm that may be caused by activities on the use of atomic energy;

ensuring nuclear and radiation safety;

compensation for harm caused by the harmful effects of IRS or activities related to the use of atomic energy;

provision of complete, reliable and timely information related to activities on the use of atomic energy, if this information does not contain state secrets, or does not relate to information, the dissemination and (or) provision of which is restricted;

prohibition of the production of nuclear weapons and other nuclear explosive devices.

The provisions of the National Security Concept [2.19] provide for "strict compliance with international rules and regulations in the field of nuclear, radiation, industrial and environmental safety during the operation of the national NPP".

Nuclear and radiation safety as the highest priority in the implementation of activities in the field of using atomic energy and ionizing radiation sources, being one of the most important components of the national security of the Republic of Belarus, is enshrined in the provisions of paragraph 1 of the Main Directions for the Implementation of a Unified State Policy in the Field of Ensuring Nuclear and Radiation Safety [3.1]. More detailed information is provided in Article 7 (7.1).

The priority of safety over other aspects of activity is also enshrined at the level of regulatory requirements established for OO. In particular, the GSP NPP [4.14] – defines that the OO ensures the safety of the NPP, including measures to prevent accidents and reduce their consequences, accounting and control, physical protection of nuclear materials, radioactive substances and radioactive waste, radiation control and monitoring of the state of the environment in the sanitary protection zone and in the supervised area, and also ensures the use of the NPP only for the purposes for which it was designed and constructed. At the same time, the GSP NPP stipulates that the OO should implement management for safety purposes and also provides a definition of this term. In particular, management for safety purposes is an activity implemented by the administrative system of the operating organization of the NPP. This system integrates all management elements in such a way that the processes and actions that ensure the fulfilment of NPP safety requirements are established and implemented taking into account other requirements, including economic requirements, requirements for managers, personnel, labor protection, environmental protection, accounting and control of nuclear materials, physical protection, quality, so that these requirements and requests do not have a negative impact on NPP safety. More detailed requirements for administrative systems in terms of ensuring the priority of safety are established in the norms and rules for ensuring nuclear and radiation safety “General requirements for OO’s Integrated Management Systems for nuclear and radiation safety” [4.17].

10 (b) Application of basic legal requirements

Priority to safety in the regulator's own activities

The priority to safety established at the legislative level is reflected in the strategic documents of Gosatomnadzor (the Policy and Strategy of Gosatomnadzor, approved by the decisions of the Gosatomnadzor Board).

The priority to safety is the basis for the activities of the regulatory body in the implementation of the functions and tasks assigned to it, are described in more detail in Article 8. For the practical implementation of the principle in the daily activities of the regulator, significant attention is paid to improving the level of safety culture of the employees of the regulatory body, as well as the growth of their competencies.

Thus, the principles of the safety culture of Gosatomnadzor and its attributes are formed with the participation of all employees of Gosatomnadzor, enshrined in the Regulation on the IMS of Gosatomnadzor (approved by the order of the Head of Gosatomnadzor). Self-assessments of the safety culture of Gosatomnadzor are carried out as well as the analysis of the results of external reviews of the activities of the regulatory body (IAEA missions, inspections by higher authorities). Based on the results of the identified discrepancies, measures are developed to improve activities in this direction.

Systematic improvement of the competence level of Gosatomnadzor employees has been organized (including events for the management of Gosatomnadzor and the Ministry for Emergency Situations). Mandatory training with subsequent knowledge testing before independent performance of official tasks is provided for young employees newly hired for positions related to regulatory supervision. Such training, among other things, includes issues of safety culture (a separate module “Safety Culture” is provided in the initial training program). Special events are held for young employees of Gosatomnadzor (information hours with the Head of Gosatomnadzor, professional skills competitions, fellowships, etc.), demonstrating commitment to safety culture on the part of the management of Gosatomnadzor, as well as aimed at increasing (expanding) the horizons of young employees on aspects related to the activities of the regulatory body, relevant experience of other countries.

The Code of Professional Conduct of the Gosatomnadzor Employee has been adopted, which is a set of general principles of service ethics and basic rules of conduct that Gosatomnadzor employees should follow when performing their official duties in order to perform their professional activities conscientiously, efficiently, and at a high professional level and to help strengthen the image of Gosatomnadzor. It is mandatory for newly hired Gosatomnadzor employees to familiarize themselves with the Code.

For collective discussion of the most important issues, including the issues related to ensuring safety at supervised facilities, a Board has been created in Gosatomnadzor, consisting of the Head of Gosatomnadzor (Chair of the Board), his deputies and other Gosatomnadzor executives.

Gosatomnadzor covers the most significant current issues of nuclear and radiation safety and significant regulatory decisions in the media and on the official Internet resource of Gosatomnadzor.

Priority to safety in the activities of the OO

According to the Decree of the President of the Republic of Belarus [2.16], the State Enterprise “Belarusian NPP” is the OO and operator of nuclear installations – power units No. 1 and No. 2 of the Belarusian NPP. The main objectives of this enterprise as an OO are to carry out activities on the siting, construction, commissioning, operation and decommissioning of NPPs, and other activities provided for by the Law of the Republic of Belarus [2.2].

The principle of the highest priority in ensuring safety is declared by the management of the State Enterprise “Belarusian NPP” in the Safety Policy of the State Enterprise “Belarusian NPP”. The Integrated Management System of the State Enterprise “Belarusian NPP” is designed to ensure the priority of nuclear and radiation safety, and one of the criteria for the efficiency and effectiveness of the functioning of such a system is compliance with safety requirements. The relevant requirements are also enshrined in the norms and rules of the regulatory body [4.17] and are assessed as part of supervisory activities.

In addition to a set of organizational measures to ensure safety priority, when selecting the design of the plant, its compliance with modern safety requirements was initially taken into account. Thus, the design of the Belarusian NPP in operation was initially developed taking into account international experience in operating WWER-1000 reactors, IAEA safety recommendations and standards, European OO requirements for new-generation nuclear power plant designs with LWR reactors, as well as NRC materials. The design provides for the resistance of the Belarusian NPP to impacts similar to those that occurred at the Fukushima Daiichi NPP. The design of the Belarusian NPP provides for the presence of safety systems and has developed technical solutions and a system of necessary measures, the use of which in design basis and beyond design basis accidents brings the reactor plant to a controlled state. Special technical systems and means are provided to back up the main safety functions and ensure an appropriate level of nuclear safety of the Belarusian NPP. Such systems include:

PHRS from protective shell;

PHRS through SG;

melt localization system;

system for monitoring and removing hydrogen from the containment shell.

The design provides for a double containment shell, which, together with other localizing systems, ensures reliable containment of radioactive products during normal operation, violations of normal operating conditions, design and beyond design basis accidents.

In accordance with the established requirements [4.1], the OO has developed and submitted to Gosatomnadzor documents justifying nuclear and radiation safety, including the SAR, technological regulations for the safe operation of the power unit, PSA, accident management instructions, accident response instructions, instructions, programs and schedules for maintenance, repair, testing and inspection of systems important to safety, etc.

Based on the results of commissioning of the power units of the Belarusian NPP, the following have been developed for each power unit of the NPP: “Final Safety Analysis Report”, “Probabilistic Safety Analysis Level 1”, “Probabilistic Safety Analysis Level 2”, which present information corresponding to the actual state of the NPP based on the results of construction, manufacture, installation, pre-commissioning adjustment work and tests at the power unit, as well as the results obtained at the stages of physical, energy start-ups and trial operation of the power units of the Belarusian NPP.

According to the results of the analysis of the Belarusian NPP BDBA modes, given in the SAR (final version), the possibility of BDBA control has been demonstrated, which in turn allows for the effective limitation of their consequences. The NPP design takes into account all external impacts of natural and man-made origin, typical for the Belarusian NPP site, including explosions, floods, air crashes, hurricanes, tornadoes, snow and ice loads, seismic impacts. When performing the safety analysis of the Belarusian NPP, the basic list of possible initial emergency events, based on the requirements of regulatory documents, was expanded taking into account:

- design features of the NPP under construction; configuration of safety systems in the design of the NPP under construction; many years of experience in designing and operating existing NPP power units with WWER reactors;
- licensing of designs of power units with WWER reactors in the Russian Federation;
- IAEA recommendations;
- results of the first and second level PSA.

According to the obtained results of the quantitative assessment performed within the framework of the first and second levels of the PSA for nuclear fuel in the core and SNF storage pool, during operation at the nominal power level, reduced power levels and the shutdown state, the value of the probability of severe accidents over 1 year and the average value of the total probability of a large accidental release over 1 year correspond to generation 3+ reactors (reactors using passive safety systems). More detailed information, including the obtained numerical values of these indicators, is given in subsection 18(i) ("Implementation of the "defence-in-depth" concept").

The PSA was performed taking into account internal initiating events and initiating events caused by internal fires and floods, external extreme impacts of natural and man-made nature, seismic impacts, during unit operation at the nominal power level, reduced power levels and shutdown condition for nuclear fuel in the core and SNF storage pool.

Safety culture

In order to implement the priority to safety, the OO has formed and is implementing a system of measures aimed at maintaining and continuously improving the level of safety culture. The main areas of activity of such a system are:

continuous training of personnel (including on safety culture issues);

forming commitment to safety culture in the daily activities of the OO units;

conducting safety culture monitoring;

a system of safety culture assessments (including an annual assessment of the state of safety culture in the form of holding a final day of safety culture);

development and implementation of measures to improve the safety culture on an annual basis;

demonstration of leadership by managers at all levels in safety issues.

Thus, local legal acts of the OO establish mandatory training and testing of knowledge of newly hired employees on the "Safety Culture" training program. Assessments of the level of safety culture of personnel in the performance of their duties are regularly conducted. Improving the level of safety culture of personnel is provided for within the framework of the implementation of programs for maintaining and improving the qualifications of plant employees. In order to create the necessary conditions for continuous improvement of safety culture both at the organizational and individual levels, to promote commitment to safety culture among employees, to maintain an atmosphere of trust and openness in safety issues, an advisory coordinating body – the Council for safety culture of the State Enterprise "Belarusian NPP" was created under the Director General of the OO.

To facilitate the effective functioning of the system for the formation and maintenance of safety culture in the structural divisions of the Belarusian NPP, authorized persons for safety culture have been appointed.

Based on the assessments and results of monitoring the state of safety culture in accordance with the Regulation on the Formation and Maintenance of Safety Culture of the State Enterprise "Belarusian NPP", an "Action Plan for the Formation and Maintenance of Safety Culture in the State Enterprise "Belarusian NPP" for the current year is annually developed and approved at the level of the Director General of the OO.

<u>Suggestion based on the results of the 8th and 9th Joint Meeting of the Contracting Parties</u>

"Belarus as a newcomer country should consider invitation of ISCA mission for the matter of evaluation of the current progress made and planned activities for fostering an infrastructure that promotes a strong safety culture and to be sure that such activity is in line with best international practices."

Since the 8th and 9th Joint Meetings of the Contracting Parties, the regulatory framework for safety culture aspects has been significantly improved (more detailed information is provided in

Article 12). However, the practical implementation of the new provisions of the Law "On Safety Regulation in the Use of Atomic Energy" regulating safety culture has not been completed.

In addition, a pilot Forum is planned for 2025 (from 11 to 12 September) to conduct research to identify national characteristics affecting safety that need to be taken into account when forming safety culture models in bodies and organizations involved in the implementation of programs for the peaceful use of nuclear technologies. The Forum will be held with the support of the Basic Organization of the CIS Member States for the Creation of National Nuclear Infrastructures under the auspices of the Commission of the CIS Member States on the Peaceful Uses of Atomic Energy. One of the main results of the Forum is expected to be the formulation of a list of national characteristics (cultures) that can influence the behaviour of NPP personnel, as well as employees of government agencies and organizations when making decisions related to ensuring nuclear and radiation safety. Such a list is planned to be used for further improvement of the nuclear safety culture both by establishing additional standards in terms of the influence of the human factor, and by taking into account when forming (updating existing) models of the safety culture of OOs and other interested organizations (government agencies).

It is noted that OO is constantly working to develop safety culture with periodic self-assessments in accordance with IAEA recommendations. In addition to such self-assessments, independent assessments of the safety culture are carried out as part of WANO peer reviews and IAEA missions. The high level of convergence of the results of self-assessments of safety culture with the results of independent peer reviews of safety culture confirm the effectiveness of the work carried out by the OO in terms of assessing the progress achieved and planning measures for additional improvements.

In this regard, it seems appropriate to conduct an ISCA mission at later stages, after the final implementation of all the innovations in the legislation. Currently, the technical and organizational capabilities for organizing an ISCA mission in the period after 2028 are being worked out.

In this regard, the proposal for the next reporting period 2025-2028 is considered closed.

Notable achievement:

The Republic of Belarus has carried out significant work to introduce the safety culture concept into the activities of interested state bodies and organizations (including OO) related to the operation of the Belarusian NPP. Thus, safety culture is legislatively (at the level of the Law – Articles 4, 7, 35, 52 [4.2]) enshrined as an element of ensuring safety in the implementation of activities in the field of atomic energy use, as well as a method of ensuring the safety of a nuclear installation. The safety culture concept is established as one of the main principles of safety regulation. The responsibilities of all interested organizations for the formation and maintenance of safety culture are defined. The norms and rules define the ways of maintaining and improving the level of safety culture both at the organizational level (through OO integrated management systems for safety purposes) and at the individual level (through demonstration of leadership in safety matters by managers at all levels of the OO) (Chapter 4 [4.17]). In September 2025, at the initiative of the Belarusian regulator, a Pilot Forum is planned to be held in the Republic of Belarus to identify national characteristics (cultures) that affect safety, that need to be taken into account when forming safety culture models in bodies and organizations involved in the implementation of programs for the peaceful use of nuclear technologies. The event will be organized by the Basic Organization for the Development of National Nuclear Infrastructures of the CIS Member States in cooperation with the regulator under the auspices of the Commission of the CIS Member States on the Peaceful Uses of Atomic Energy.

To further improve the work on the implementation of the concept of safety culture, regulation and supervision of aspects related to the consideration of human and organizational factors, the functioning of integrated management systems in the OOs, a separate division has been created in the regulator – the Division for Supervision of the OOs Activities consisting of 3 employees.

Independent safety assessments

In order to continuously improve the safety level of the Belarusian NPP, independent review missions are invited to consider individual aspects of safety, including under the IAEA auspices:

October 2016 – Integrated Regulatory Review Service (IRRS);

January 2017 – Site and External Events Design Review Service (SEED);

October 2018 – Emergency Preparedness and Response Review Service (EPREV);

May 2019 – Safeguards and State Systems of Accounting for and Control of Nuclear Material Advisory Service (ISSAS);

August 2019 and October 2021 – Operational Safety Review Team (OSART);

June-July 2021 – International Physical Protection Advisory Service (IPPAS).

Targeted implementing of recommendations and consideration of missions suggestions has been ensured.

Since 2015, the Belarusian NPP has been a member of WANO, within the framework of which:

performs peer reviews involving specialists from NPPs around the world;

receives support in preparing for expert missions;

participates in NPP technical support missions organized and conducted by WANO;

receives information on the operating experience of all NPPs in the world;

participates in programs of technical visits to other NPPs;

participates in emergency response training as part of the Regional Crisis Center;

participates in training workshops conducted by WANO.

Information on the missions conducted by WANO is provided in 14 (ii).

10 (c) Regulatory assessments and supervision

At nuclear facilities, in order to improve the efficiency of control and supervision activities, Gosatomnadzor initiated and subsequently legislatively established the implementation of inspections in the continuous supervision mode – without any restrictions on the frequency and duration of such inspections. To ensure this, Gosatomnadzor created and ensured the functioning of an inspection unit directly at the site of the Belarusian NPP in the amount of 6 employees. Various types of control and supervision tools for conducting inspections are provided, including scheduled and unscheduled inspections. More detailed information on approaches, forms of supervision activities and inspection programs is provided in Article 7 (7.2 (iii)). The inspection programs of Gosatomnadzor (the System of Basic and General Supervision Programs, information on which is also provided in 7.2 (iii)) provide for verification of compliance with the principles of ensuring the priority of safety both in terms of the activities of the operating organization (General Supervision Programs “Operating organization management system”, “Safety culture and leadership”), and in terms of technical aspects of NPP operation (General Supervision Programs “Ensuring operational safety and taking safety experience into account”, “NPP design management”).

The system of legislation on nuclear and radiation safety establishes requirements for the following:

periodic safety assessment of a nuclear installation, storage facility, disposal facility of the operating organization (including assessment of the cumulative effect of aging processes and equipment modifications, use of operating experience) – once every 10 years;

current (annual) assessment of the safety status of a nuclear installation, storage facility, or disposal facility of the operating organization;

current (annual) assessment of the state of activities in the field of atomic energy use (in relation to all licensees, including those providing services for OO).

Reports on the implementation of these assessments are submitted to the regulatory authority. Their analysis is carried out within the framework of licensing control procedures, if necessary – with the involvement of scientific and technical support organizations and the expert community. The implementation of the approach to ensuring the priority of safety through strict and complete compliance with all established standards for nuclear and radiation safety is the subject of such analysis.

Safety prioritization is also a key topic in regular meetings of the management of the regulatory body and the OO.

Summary of significant changes since the previous National Report

The main changes since the previous National Report was published are the changes in the status of the nuclear facility. Currently, both units of the Belarusian NPP are in the operational phase. The relevant changes and additions to the documents justifying safety were submitted to the regulatory body, analysed, and decisions were made on their compliance with the established requirements. Based on the results of commissioning of power unit No. 2 of the Belarusian NPP, as well as taking into account all the modifications carried out at the NPP, the probability of severe accidents for 1 year (8.36*10-7 (1/year)) and the average value of the total probability of a large emergency release for 1 year (9.94*10-8 (1/year)) were recalculated and adjusted. The PSA was performed taking into account internal initiating events and initiating events caused by internal fires and floods, external extreme impacts of natural and man-made nature, seismic impacts during unit operation at the nominal power level, reduced power levels and shutdown states for nuclear fuel in the core and SNF storage pool. This indicator corresponds to generation 3+ reactors (reactors using passive safety systems).

In general, based on the results of commissioning of the power units of the Belarusian NPP, the following were developed for each power unit of the NPP: “Final Safety Analysis Report”, “Probabilistic Safety Analysis Level 1”, “Probabilistic Safety Analysis Level 2”, which present information corresponding to the actual state of the NPP based on the results of construction, manufacture, installation, pre-commissioning adjustment works and tests at the power unit, as well as the results obtained at the stages of physical, energy start-ups and trial operation of the power units of the Belarusian NPP. Changes resulting from commissioning works that affect the operating conditions of the power unit were previously included into the preliminary version of the SAR and passed safety assessment by the time of issuance of the license for operation of power units No. 1 and 2 of the Belarusian NPP.

In 2024, the OO conducted a self-assessment of the level of safety culture at the State Enterprise “Belarusian NPP”, the results of which were reviewed at the meeting of the Council on Safety Culture of the State Enterprise “Belarusian NPP”, and areas for improvement were identified.

Other changes, directly or indirectly related to strengthening and developing approaches to ensuring the priority of safety of infrastructural character are indicated in the relevant chapters of this National Report.

ARTICLE 11. FINANCIAL AND HUMAN RESOURCES

1. Each Contracting Party shall take the appropriate steps to ensure that adequate financial resources are available to support the safety of each nuclear installation throughout its life.

2. Each Contracting Party shall take the appropriate steps to ensure that sufficient number of qualified staff with appropriate education, training and retraining are available for all safety-related activities in or for each nuclear installation, throughout its life.

Summary statement for Article

The Republic of Belarus fully meets its obligations to provide financial and qualified human resources to maintain the safety of nuclear installations operating in the country.

11.1 Financial resources

The OO ensures the organization and performance of work in such a volume and of such quality that meet the requirements of technical regulatory legal acts, at all stages of siting, design, construction, commissioning, operation, limitation of operational characteristics, extension of the operating lifetime, decommissioning of a nuclear installation and (or) storage facility.

The OO has created structural divisions to carry out activities on the management and control of the construction and operation of NPPs. The structural divisions are endowed with the necessary rights, financial resources, material and human resources in accordance with the requirements of the GSP NPP [4.14].

Financing of the economic activities of the OO is carried out at the expense of funds received from the sale of electricity produced by the Belarusian NPP, as well as at the expense of other sources permitted by law. The Decree of the President of the Republic of Belarus [2.17] created a fund for financing works on decommissioning of NPPs and a fund for financing works on maintaining and improving the safety of NPPs, intended to finance the following activities:

development of technical regulatory legal acts;

conducting research and development work to create new technologies and equipment, improving the safety of decommissioning, early decommissioning or limiting the operational characteristics of NPPs;

development of pre-design (pre-investment) and design documentation, including a comprehensive engineering survey of NPPs;

implementation of preparatory work (removal of nuclear fuel and other nuclear materials from the reactor core, SNF storage pool and NPP unit premises, removal of radioactive working media from the equipment and process systems of the NPP unit, decontamination of equipment, systems, premises and building structures of the NPP unit in the volume necessary to prepare for the decommissioning of the NPP unit, processing or removal of radioactive waste accumulated at the NPP unit during its operation, and other activities);

procurement of equipment;

performance of work on managing nuclear fuel, spent nuclear fuel;

implementation of technical measures during decommissioning, early decommissioning, limitation of operational characteristics of NPPs in accordance with the design, technical and operational documentation;

maintenance of employees (personnel) and NPP facilities from the date of the decision on decommissioning, early decommissioning or limitation of operational characteristics of NPPs until the completion of the specified work;

radioactive waste management, including ensuring the disposal (long-term storage) of RW, including the reconstruction of existing ones, as well as the siting, design and construction of new storage (disposal) facilities for RW;

ensuring the physical protection of NPPs, nuclear materials, radioactive substances and radioactive waste;

ensuring emergency preparedness of the State Enterprise “Belarusian NPP”;

obtaining consulting services and services for scientific and technical support for preparation for decommissioning of NPPs and its units;

scientific support for maintaining and improving the safety of NPPs;

implementation of work to improve nuclear, radiation, fire, industrial and environmental safety of NPPs;

implementation of work aimed at improving the safety of NPPs associated with changes in national requirements and international obligations;

financing the costs of spent nuclear fuel management after its delivery to the storage facility;

maintenance and improvement of systems for managing radioactive waste and spent nuclear fuel of NPPs generated during NPP operation, NPP physical protection systems and emergency preparedness and response systems;

siting, design and construction of storage (disposal) facilities for radioactive waste and spent nuclear fuel generated during NPP operation (including storage accumulation sites);

ensuring the disposal (long-term storage) of radioactive waste and returned waste from spent nuclear fuel processing generated during NPP operation;

modernization of systems and equipment, introduction of new equipment to maintain and improve NPP safety;

acquisition and modernization of calculation and analytical complexes and software for performing NPP safety assessments;

formation and replenishment of the repair (insurance) reserve of the State Enterprise "Belarusian NPP".

The source of filling the funds of the Belarusian NPP is the revenue from the sale of electric energy supplied from the NPP. Contributions to the funds of the Belarusian NPP are made from December 2023 (the month following the month in which the power unit No. 2 was commissioned (November 2023)).

By Resolution of the Council of Ministers of the Republic of Belarus dated April 23, 2021 No. 245, the State Program "High technologies and Equipment" for 2021-2025 was adopted, one of the objectives of which is to develop scientific support for the efficiency and safe operation of the Belarusian NPP throughout its life cycle, radioactive waste and spent nuclear fuel management, as well as scientific support for the development of promising areas of peaceful use of atomic energy. A similar program was implemented in the period from 2016 to 2020.

In order to create a mechanism for financial support of liability for nuclear damage in the Republic of Belarus in the implementation of activities on the use of atomic energy, the Decree of the President of the Republic of Belarus [2.18] was adopted. In accordance with this Decree, the form of financial security for the liability of the State Enterprise "Belarusian NPP" for nuclear damage is civil liability insurance.

Thus, sufficient financial resources have been provided for the implementation of the nuclear power design.

11.2 Human resources

In the Republic of Belarus, a system of personnel training for providing nuclear energy with highly qualified specialists has been formed, integrated into the national education system. Thus, in higher and secondary specialized educational institutions of the country (educational institutions "Belarusian National Technical University", "Belarusian State University of Informatics and Radioelectronics", "Belarusian State University", "International Sakharov Environmental Institute of Belarusian State University", "Minsk State Power Engineering College"), students are trained in specialties in the field of nuclear energy, including "Nuclear Physics and Technology", "High-Energy Chemistry", "Design and Operation of Nuclear Power Plants", "Information and Control Systems of Physical Installations", "Nuclear and Radiation Safety", "Power Plants".

The training program for specialists with higher education involved in NPP operation includes basic (5-5.5 years) training at universities in the Republic of Belarus, including practical training abroad, special (0.5-3 years) training at foreign universities for specialists with work experience in power enterprises of the Republic of Belarus, fellowships at existing nuclear facilities abroad and training according to individual programs at the STC.

A mechanism is provided for financing activities to improve qualifications, conduct fellowships, training workshops for teaching staff, employees of key government agencies involved in the implementation of the nuclear power design (including the regulatory body), scientific institutions in countries with developed nuclear energy. Financing is carried out both within the framework of State Programs (the current State Program for 2021-2025 – “Education and Youth Policy”, subprogram 8 “Training of Personnel for Nuclear Power”), and within the framework of the own funds of state bodies and institutions.

In addition to the listed activities, the Republic of Belarus is intensively using the available IAEA technical assistance (technical cooperation programs) to train specialists for the nuclear power program. These programs provide expert and advisory assistance on the creation of a personnel training system for nuclear power, taking into account international experience and IAEA recommendations. The programs include workshops and training sessions, visits by Belarusian scientists and university professors to the Simulation Training Center and research institutes abroad, and visits by Belarusian specialists to operating nuclear power plants.

Employees working in the field of nuclear energy and IRS are required to undergo training and testing (assessment) of knowledge on nuclear and radiation safety issues in the manner established by the Instruction on the procedure for training and testing (assessment) of knowledge on nuclear and radiation safety issues [4.6]. Advanced training of specialists on these topics is carried out in educational institutions that have a permit for the implementation of relevant educational programs issued by Gosatomnadzor as part of the implementation of administrative procedures.

In accordance with the requirements of [2.2, 4.14], the OO has created a system for the selection, training, retraining and advanced training of employees (personnel), as well as maintaining their required number.

Personnel training of the Belarusian NPP is carried out both in educational institutions of the Republic of Belarus and the Russian Federation, and at the Simulation Training Center, as well as at workplaces in structural divisions.

Personnel training at the Simulation Training Center and structural divisions is carried out under the supervision of qualified managers and specialists. Training is organized taking into account the qualifications of students (based on the results of the incoming control of the level of knowledge) and is carried out according to individual training programs. To organize the training and maintain the qualifications of the personnel, the Simulation Training Center is equipped with modern equipment, including simulators, computer training systems, visual materials (posters, models, stands, etc.), educational and methodological materials, which allows to significantly improve the efficiency of training. The Simulation Training Center has implemented a comprehensive information system (CIS), which significantly facilitates the work of instructors in implementing the personnel training process according to the methodology of a systematic approach to training. The comprehensive information system interface allows for standardized management of activity analysis, design of educational and methodological materials, training planning and the formation of records and reporting documents. Every year, events are organized and carried out to train and improve the qualifications of employees in third-party educational institutions, including on issues of nuclear and radiation safety.

In training workshops and training courses held in 2022 in third-party educational institutions of the Republic of Belarus and the Russian Federation, 890 employees of the enterprise underwent training in professional training, retraining, advanced training, training courses and other educational programs, in 2023 – 729 employees, in 2024 – 845 employees. At the beginning of 2025, the State Enterprise “Belarusian NPP” (on the base of the STC) received a special permit (license) from the Ministry of Education of the Republic of Belarus to implement an educational program for advanced training of management personnel and passed state accreditation (its confirmation). At present, part of the educational programs for advanced training is planned to be implemented directly in the STC.

The qualifications of NPP personnel are maintained annually on the basis of qualification maintenance programs. The annual training hours under qualification maintenance programs for the operational personnel of the MCR is at least 80 hours, including no less than 36 hours of practical training on simulators.

The State Enterprise “Belarusian NPP” has developed and approved a roadmap of activities for the implementation of work on technical support of the full-scale simulator and analytical simulators of the STC of the Belarusian NPP for the period 2022-2025, including work on the modernization of the full-scale simulator and periodic confirmation of compliance of the full-scale simulator with the MCR of power unit No. 1 (in accordance with the Program for maintaining and improving the safety of NPPs for the period of operation of power units No. 1, 2 of the Belarusian NPP).

In accordance with the calendar plan, in 2023, the works on the modernization of the full-scale simulator were completed (equipment delivery, installation works to bring the MCR panels and consoles of the technical means of operational and dispatch control of the FSS into compliance, the software was modified, work was carried out to verify the mathematical model and acceptance tests were carried out. Currently, work is underway to conduct periodic confirmation of compliance of the FSS with the MCR (completion date – December 2025). The implementation of the activities of the Program for maintaining and improving the safety of NPPs for the period of operation of power units No. 1, 2 of the Belarusian NPP makes it possible to maintain the FSS configuration at the level of the actual state of the MCR of the prototype power unit.

The minimum requirements for the number and composition of personnel are established in the NPP design and are given in the NPP SAR and the process regulations for the safe operation of the NPP power unit. The assessment of the adequacy of personnel was one of the questions posed to the experts as part of the review of the specified documents during the licensing procedure of the Belarusian NPP (the review confirmed the adequacy of personnel).

During the COVID-19 pandemic, at the initiative of the regulator, the OO developed the Regulation on the safe termination of nuclear hazardous work in the event of a sharp reduction in the number of personnel below the minimum justified safety level. The Regulation is universal in nature and is applicable in any situation (including epidemics and pandemics, regardless of the etiology of the pathogen, as well as other impacts leading to a reduction in the number of personnel). In addition, during the COVID-19 pandemic, experience was gained in organizing anti-epidemic measures (including vaccination of personnel, mask regime, maximum transition of the interaction format to the virtual conference call mode in those areas of activity of the OO, regulator and other interested government agencies, where applicable).

The total number of personnel of the State Enterprise “Belarusian NPP” is 2718 people. The management team of the State Enterprise “Belarusian NPP” and the operating departments are staffed with qualified employees in accordance with the qualification requirements for NPP personnel (established by issue 12 of the Unified qualification handbook of employee positions “Positions of workers employed in the nuclear power industry”, approved by the Resolution of the Ministry of Labour and Social Protection of the Republic of Belarus dated May 29, 2020 No. 56). When calculating the number of operational personnel, the following were taken into account:

three-shift work schedule; days off, vacations and sick days;

the need for continuous training (maintaining and improving qualifications, undergoing advanced training, etc.).

Taking into account the need for a reserve of operational personnel, one operational workstation is staffed with five to eight employees (depending on the position/profession).

The key positions of operational personnel of the MCR of power units No. 1, 2 of the Belarusian NPP, as well as shift supervisors of NPPs with long training periods are staffed with qualified specialists who have undergone training, including practical training with practicing interaction as part of shifts at the FSS of the Belarusian NPP, testing (assessment) of knowledge in the Gosatomnadzor commission, and received permits for the right to conduct a technological process when carrying out activities in the field of atomic energy use.

The procedure for issuing permits by Gosatomnadzor for the right to carry out work when implementing activities in the field of atomic energy use to the personnel of the Belarusian NPP is carried out in accordance with the Categories of employees of the State Enterprise “Belarusian Nuclear Power Plant” who should obtain permits for the right to carry out work when implementing activities in the field of atomic energy use [4.12].

Information on the regulatory body's training system is reflected in Article 8.

Summary of significant changes since the previous National Report

No significant changes have been implemented at the level of the national personnel training system since the previous National Report. At the OO level, it is noted that the Belarusian NPP received (early 2025) a special permit (license) from the Ministry of Education of the Republic of Belarus to implement an educational program for advanced training of management personnel based on the Simulation Training Center and the corresponding state accreditation procedure (confirmation of the issued license). The measures taken will allow some of the educational programs for advanced training to be implemented directly at the STC, which will expand the training opportunities for both NPP personnel and other organizations involved in the implementation of the nuclear power design.

ARTICLE 12. HUMAN FACTORS

Each Contracting Party shall take the appropriate steps to ensure that the capabilities and limitations of human performance are taken into account throughout the life of a nuclear installation.

Summary statement for Article

The Republic of Belarus has taken all necessary measures to ensure that the impact of human limitations and capabilities on the safe operation of a nuclear facility is taken into account. A corresponding legislative framework has been formed, control systems are in place both on the part of the regulator and the OO with respect to the impact of the human factor. A system of measures for the selection of qualified personnel, subsequent improvement of their qualifications, continuous growth of the level of nuclear safety culture has been developed and is being maintained, contributing to the reduction of the negative impact of the human factor on safety.

12 (a) Regulatory requirements and supervision

In the Republic of Belarus, regulatory requirements have been established for taking into account the human factor in terms of its impact on nuclear and radiation safety. In addition, the legislative framework, supervisory procedures of the regulatory body and the system of measures of licensees have been determined for:

formation and continuous improvement of the level of safety culture, directly contributing to the reduction of negative consequences of the influence of the human factor on the operation of NPPs;

creation of OO management systems for safety purposes, including in terms of facilitating such systems to maintain and improve the level of safety culture at the organizational level;

demonstration of leadership in matters of fulfilling safety requirements by managers.

Thus, according to Article 35 [2.2], the OO should create and implement an Integrated Management System for safety purposes (including a quality management system), based on the consideration and mutual agreement of the application of safety requirements and other requirements in its activities, and also ensure that the influence of the human factor is taken into account. It follows from Article 1 [2.2] that the design for a nuclear installation and (or) a storage facility, a disposal facility should reflect the issues of taking into account the influence of the human factor. Article 7 [2.2] defines safety culture as one of the elements of ensuring safety in the use of atomic energy, and Article 52 defines maintenance and continuous improvement of safety culture as one of the means of ensuring safety of a nuclear installation. Formation, maintenance and continuous strengthening of a high level of safety culture is one of the duties and responsibilities of the OO according to Article 35 [2.2].

The norms and rules for ensuring nuclear and radiation safety [4.14, 4.17] establish requirements for the OO to form safety culture as a set of measures to eliminate the negative impact on safety, within the framework of the implementation of the concept of defence in depth (level 1). The components of the formation and maintenance of safety culture are established, the basis of which also lies in the plane of the employee's influence on safety, accounting for and timely elimination of the consequences of errors made by such an employee [4.14]. In 2021, the regulator issued separate requirements for the OO IMS in terms of ways for such a system to contribute to the formation and maintenance of safety culture, as well as in terms of ways to demonstrate leadership in matters of meeting safety requirements by managers at all levels of the OO [4.17].

The influence of the human factor is taken into account, including within the framework of the analysis and accounting of operating experience, as well as in the event of disruptions in the operation of the NPP [4.16, 4.18].

12 (b) Accounting human factors in the design of a nuclear installation

Regulatory requirements have also been established for taking into account the influence of the human factor at the design stage of the NPP. Thus, the NPP design should provide for measures that facilitate the personnel's making correct decisions and make it more difficult to make incorrect ones, and should provide technical means to detect, correct and compensate the errors. The reliability assurance system should ensure the NPP's protection from human error and minimize the likelihood of negative consequences of an error. The NPP should be insensitive to human error, in particular, due to the operation of automatic control or protection systems designed taking into account the human factor. In these cases, personnel intervention in the NPP's operation may be allowed only when there is sufficient time for diagnostics and corrective actions. In particular, the design solutions for the power unit provide for measures to prevent possible human errors that disrupt its normal operation and limit their consequences. Technical measures are provided for preventing and limiting the consequences of erroneous actions by personnel that disrupt safety functions and can lead to accidents.

12 (c) Licensee's measures on accounting the influence of the human factors during the operation and maintenance of a nuclear installation

The influence of the human factor is reduced by selecting NPP personnel and ensuring the required level of their qualifications in order to avoid the negative impact of personnel actions on safety. The organization of work and selection of personnel by the OO are determined taking into account the requirements of the regulatory legal acts of the Republic of Belarus, recommendations of international organizations, international experience and local legal acts of the State Enterprise “Belarusian NPP”. The negative influence of the human factor and the improvement of the quality of the work performed by the OO are ensured by trained and authorized for independent work operating personnel, as well as by personnel of contracting organizations with practical skills in the work, possessing the necessary qualifications.

Performance of certain types of work in the implementation of activities in the field of the use of atomic energy, directly affecting nuclear and radiation safety, is carried out by employees of the OO, if these employees (personnel) have the appropriate permits issued by Gosatomnadzor [2.2]. Moreover, such a permit can be issued only if the employee meets the established qualification requirements of the Unified qualification handbook of employee positions, approved by the Resolution of the Ministry of Labour and Social Protection of the Republic of Belarus No. 56 of May 29, 2020, has no medical contraindications, has undergone a psychophysiological examination, appropriate training for the position and passed the test and knowledge assessment [3.11].

The work has been organized and is being carried out to develop safety culture among all personnel involved in the work at the enterprise. Personnel training is conducted on an ongoing basis at the Simulation Training Center, including on the following topics: “Safety Culture General Provisions”, “Organization of Work on Safety Culture Formation”, “The Human Factor Influence on the NPP Safety and General Principles of Error Prevention”, “Tools for Preventing Personnel Errors”, “Monitoring the Personnel Performance”, “Leadership in Nuclear Energy”, etc. Training is conducted on the formation of successful teamwork, interaction of employees with each other, error-free and timely transmission and reception of information, overcoming stress and anxiety, etc.

An important component of the system for ensuring the reliability of professional activities of personnel is the psychophysiological examination (PE).

The purpose of the PE is to assess the compliance of the psychophysiological properties and professionally important qualities (PIQ) of employees/job candidates with the requirements of the position (profession) and to predict the reliability of their professional activities. The methods and techniques for conducting the PE have been developed with the involvement of relevant scientific institutions.

Depending on the goals, the following types of PE are conducted:

primary – conducted for the purpose of psychophysiological professional selection before hiring for candidates for all positions and professions;

periodic – is carried out for the purpose of monitoring and analysing the dynamics of psychophysiological properties and PIQ to identify early signs of psychological maladaptation that affect the reliability of the professional activities of personnel (in accordance with the categories of employees of the State Enterprise “Belarusian Nuclear Power Plant”, the list of positions of employees who should obtain permits from the Gosatomnadzor for the right to carry out work when carrying out activities in the field of using atomic energy, and the list of positions (professions) of employees that are subject to the PE);

extraordinary – is carried out in the following cases:

the need to make personnel decisions (transfer to positions (professions) subject to the PE; enrolment in the personnel reserves of the OO; selection from several candidates for a position (profession);

in case of deterioration of the employee's health or a break in work activity for more than 3 months;

in case of erroneous actions of personnel during work activity, leading to a violation of the technological process, economic damage, injury;

if the employee has signs of difficulty in psychological/psychophysiological adaptation to work activity;

in case of the need to clarify the results of the PE, unreliability of the results obtained, after undergoing psychophysiological and psychological support measures.

During the PE, the following are analysed and assessed:

general functional state of the body, reflecting the degree of tension of the regulatory mechanisms in response to the impact of any stress factors on the body;

functional state of the nervous system, which largely determines the behaviour of the body and its capabilities in the process of professional activity;

cognitive abilities (the ability of the brain to absorb and process incoming information);

level of socio-psychological adaptation in general, and in particular:

motivation for professional activity;

responsibility, discipline, norm acceptance;

adaptive potential (self-control, emotional-volitional stability and stability in stressful situations);

ability to work in a team, coordinate your work with colleagues, communication skills:

leadership potential (only for managers).

In addition to determining the psychophysiological status of workers, the OO systematically organizes work on psychological and psychophysiological support for NPP workers. Such measures contribute to the restoration and maintenance of the optimally high level of functional reliability of the psychological and psychophysiological state of the NPP personnel, ensure the reliability of personnel in relation to the so-called human factor, and therefore the preservation of their professional qualities, health and longevity, and, consequently, have a positive effect on the uninterrupted operation of the entire nuclear power plant.

Medical requirements for staff

Personnel of the OO, who have the right to carry out work in the implementation of activities in the field of the use of atomic energy, personnel performing work in harmful and (or) hazardous working conditions, undergo mandatory preliminary (upon hiring) and periodic (in accordance with the approved schedule) medical examinations. Medical examinations are carried out in order to ensure labour safety, prevent occupational diseases, and protect the health of workers.

Requirements for testing (assessment) of knowledge

The personnel of the State Enterprise “Belarusian NPP” undergoes testing (assessments) of knowledge in the manner established by the Instruction on the procedure for training, internship, instructing and testing of knowledge on occupational safety issues, approved by the Resolution of the Ministry of Labour and Social Protection of the Republic of Belarus No.175 of November 28, 2022, as well as the Regulation on the procedure for organizing and conducting testing of knowledge of the State Enterprise "Belarusian NPP" 0.0370.OTI.PO-23.

When performing work on the site of the Belarusian NPP, the personnel should have a certificate containing information of successful testing (assessment) of knowledge and provide it to the controlling persons upon their demand. Testing (assessment) of knowledge is carried out depending on the position (profession) of the employee.

Before being allowed to work independently, the operating personnel of the Belarusian NPP undergoes a testing (assessment) of knowledge to the extent necessary for the position held.

Managers at all levels responsible for the safe operation of the Belarusian NPP or ensuring departmental safety control, and facility operators should undergo a medical examination and psychophysiological examination, and have personal permits for the right to carry out work when implementing activities in the field of atomic energy use.

Organizations providing OO services should ensure the training and testing (assessment) of the knowledge of their personnel, including on nuclear and radiation safety issues. The results of testing (assessment) of knowledge are recorded in the relevant protocols and verified. The personnel of contractors participating in repair work at the NPP undergo additional testing (assessment) of knowledge at the Belarusian NPP Simulation Training Center before being allowed to work. Also, training of the personnel of contractors is carried out at the Belarusian NPP Simulation Training Center on issues of safe performance of work and safety culture.

12 (d) Regulatory supervision and control activities on accounting the influence of human factors

Assessment of the human factor influence on safety is conducted by the regulator both within licensing and permitting activities, and during inspections.

For instance, as part of safety review of documents justifying nuclear and radiation safety, the regulator assesses the compliance of design basis with the RLA requirements, including on issues related to consideration of human factor.

One of the components of regulatory supervision is the procedures for issuing personal permits for the right to carry out work in the field of atomic energy. In the course of such procedures, apart from medical component, the regulator evaluates the training of personnel, both in the form of testing and in the form of an interview – additionally for senior officials of the licensee, providing a demonstration of leadership in safety issues. Such additional interview assesses candidate's commitment to safety issues, if necessary, additional requirements are established, which are contained in the issued personal permit.

One of the grounds for issuing personal permits is a positive result of a testing (assessment) of knowledge on nuclear and radiation safety, which is conducted by the regulator's commission.

Within the framework of supervisory activities, identified violation of requirements in the field of nuclear and radiation safety are assessed and analysed, including from the perspective of the human factor influence on their occurrence. Should such influence is revealed, specific employees who have committed violations are listed in reports on results of inspections, which subsequently allows the licensee to more fully conduct a detailed analysis and search for the root cause of the violation. In addition, as a rule, targeted inspections of the operator's IMS functioning are performed annually in terms of ensuring safety requirements, as well as inspections of the state of affairs to maintain and improve the safety culture level. During such inspections, key attention is paid to personnel. When detecting clear signs of insufficient level of safety culture among employees who have committed violations of the RLA requirements, technical RLA in the field of nuclear and radiation safety, extra training and extraordinary tests (assessments) of knowledge are preformed in order to exclude further potential impact on the entire level of safety. If necessary, the regulator also requests disciplinary measures against such employees.

Taking into account the transition of the Belarusian NPP to the operational stage, the regulator adopted the Basic Supervision Program, which, among other things, includes the following areas of regulatory assessments on personnel-related issues: “Management system of the OO”, “Safety culture and leadership”, “Personnel training system”.

Therefore, the measures taken by the regulator are generally sufficient to ensure regulatory supervision over consideration of human factor influence on nuclear and radiation safety by the licensees.

Suggestion based on the results of the 8th and 9th Joint Meeting of the Contracting Parties

“Covering all aspects of human factors in the next National Report.”

The suggestion has been implemented. The text above provides comprehensive information confirming the fulfilment by the Republic of Belarus of the obligations arising from Article 12 of the CNS.

To further improve the work on regulation and supervision of aspects, including those related to taking into account human and organizational factors, a separate division has been created in the regulator – the Division for Supervision of the OOs Activities consisting of 3 employees.

Summary of significant changes since the previous National Report

Since the publication of the previous National Report, the legislative framework has been significantly improved, including both high-level documents and detailed regulatory requirements regarding aspects of the formation and continuous improvement of safety culture, as one of the main instruments of influence on the activities of the personnel of the OO and other interested organizations. A Forum on identifying and subsequently taking into account in the work of national characteristics (cultures) that potentially affect the performance of personnel duties with the participation of all interested organizations of the Republic of Belarus and experts from the vendor country – the Russian Federation – is planned to be held (scheduled for the period after the uploading of this National Report).

ARTICLE 13. QUALITY ASSURANCE

Each Contracting Party shall take the appropriate steps to ensure that quality assurance programs are established and implemented with a view to providing confidence that specified requirements for all activities important to nuclear safety are satisfied throughout the life of a nuclear installation.

Summary statement for Article

The Republic of Belarus has taken all necessary measures both to develop and implement quality assurance programs and, in general, to introduce an integrated management system for safety purposes in the OO, comprehensively taking into account all aspects of the OO's activities (including quality management) in such a way that nuclear and radiation safety requirements have priority.

13 (a) Regulatory requirements and supervision

Requirements for ensuring high-quality performance of work at all stages of the life cycle of a nuclear installation are provided for both at the level of legislative acts and at the level of technical requirements (norms and rules for ensuring nuclear and radiation safety). Thus, the Law of the Republic of Belarus [2.2] establishes requirements for both OO and organizations providing services for OOs to organize and perform work in such a volume and of such quality that meet the requirements of regulatory legal acts, including mandatory technical regulatory legal acts. In addition, the Law establishes a requirement for OOs to create and implement an integrated management system for safety purposes, including a quality management system and based on the consideration and mutual agreement of the application of safety requirements and other requirements in their activities. According to the Decree of the President of the Republic of Belarus [2.7], licensing requirements and conditions are established both for OOs and for organizations providing services in terms of:

availability and ensuring the effective functioning of a management system for safety purposes or a management system and (or) quality control of the implementation of licensed activities in terms of compliance with requirements in the field of ensuring nuclear and radiation safety, as well as their improvement on an ongoing basis

ensuring quality control of the activities of organizations performing work for OOs and (or) providing OOs with services in the field of using atomic energy and ionizing radiation sources in such a volume and quality that make it possible to exclude the occurrence of non-conformities with the requirements in the field of ensuring nuclear and radiation safety or to identify such non-conformities before they begin to affect nuclear and radiation safety – for operating organizations.

Ensuring the required quality of NPP systems (elements), as one of the components of the first level of the defence in depth concept, is established in the GSP NPP, as well as the requirement for the availability of quality assurance programs. At the same time, quality assurance programs, as one of the documents justifying safety in accordance with [4.1], are subject to mandatory review within the framework of licensing procedures.

Guided by modern IAEA approaches (including the IAEA publication GSR Part 2 Leadership and Management for Safety), Gosatomnadzor has issued norms and rules for ensuring nuclear and radiation safety "General requirements for the operating organization management systems in order to ensure nuclear and radiation safety" [4.17]. This document establishes a process approach to the construction of the IMS, which assumes the inclusion of a quality management system in the IMS as one of the elements or subsystems of the IMS. At the same time, it is established that the priority (in relation to other requirements and aspects of the OO's activities) fulfilment of nuclear and radiation safety requirements is the purpose of the IMS functioning. The corresponding requirements are established for conducting IMS assessments to achieve this goal.

Thus, the regulator is making a gradual transition from developing detailed requirements for a separate aspect affecting safety – quality assurance programs – to regulating all such aspects as a whole, in the context of their integration within the IMS. In this regard, the regulator does not establish detailed requirements for the composition and content of quality assurance programs – such requirements are established by the OO within the IMS.

When implementing supervisory activities, the effectiveness of the IMS measures to ensure quality in terms of meeting nuclear and radiation safety requirements is assessed. When conducting safety reviews, a comprehensive assessment of the impact of all aspects on the quality of work is also carried out (not only the implementation of quality assurance programs, but also other IMS documents related to quality).

In the system of supervision programs of the regulatory body, the thematic issue of “Quality management system” is assessed within the framework of the thematic area “OO management systems”.

The OO annually submits to the regulatory authority a Report on the assessment of the current safety status of the nuclear facility, which contains, among other things, information on the fulfilment of the established licensing requirements for quality assurance, information on the audits of the quality management systems of organizations providing services (suppliers), as well as information on the results of the annual analysis of the effectiveness of the IMS processes (including those related to quality aspects).

The regulatory body takes such information into account when planning supervisory activities both in relation to the OO itself and to subcontractors.

Thus, the measures taken by the regulator are, in general, sufficient to ensure regulatory supervision of quality assurance at the construction site of the Belarusian NPP in terms of activities important for ensuring nuclear and radiation safety.

13 (b) Licensee's measures

The OO has developed, incorporated and is implementing a system of quality assurance programs. The Nuclear Power Plant Quality Assurance Program (NPP QAP) is the main document defining the principles, objectives and main provisions of the OO's activities in developing and implementing all other quality assurance programs at all stages of the nuclear power plant life cycle, as well as the requirements for quality assurance by organizations providing OO services [4.32].

The OO has adopted organizational and technical decisions aimed at creating an appropriate quality control infrastructure. The relevant quality management procedures are provided for in the integrated management system (the quality management system is one of the IMS subsystems). Responsibility for implementing quality assurance activities has been established.

The OO IMS policy defines safety assurance as the highest priority in the implementation of activities. The IMS has implemented such safety aspects as nuclear safety, radiation safety, industrial safety, fire safety, technical safety, nuclear security, environmental safety, labour protection by identifying the relevant processes, as well as such elements as quality assurance, human and organizational factors, and socio-economic aspects. The highest priority of the enterprise is to ensure safety.

To date, within the framework of the OO IMS, the following systems have been implemented, are functioning and maintained up to date, and are also certified in the National Conformity Assessment System of the Republic of Belarus:

quality management system for the production of electric and thermal energy, performance of the functions of the customer and developer, provision of engineering services in the implementation of activities in the field of construction of objects of 1-4 classes of complexity for compliance with the requirements of STB ISO 9001-2015 “Quality Management Systems. Requirements” (certificate of conformity No. BY / 112 05.01. 003.01.01263 dated September 10, 2024, valid until December 1, 2025);

health and safety management system for professional activities of electric and thermal energy production for compliance with the requirements of STB ISO 45001-2020 “Health and safety management systems for professional activities. Requirements and guidance for use" (certificate of conformity No. BY/112 05.04. 003.01.01265 dated September 10, 2024, valid until December 12, 2026); BY/112 05.04. 003.01.00051 dated April 28, 2021, valid until April 28, 2024);

environmental management system for the production of electric and thermal energy for compliance with the requirements of STB ISO 14001-2017 "Environmental management systems. Requirements and guidance for use" (certificate of conformity No. BY/112 05.10. 003.01.01264 dated September 10, 2024, valid until December 12, 2026);

quality management system, including specific requirements for the application of ISO 9001:2015 by organizations in the nuclear power supply chain that supply products and services important to nuclear safety in accordance with STB ISO 19443 "Quality management systems. Specific requirements for the application of ISO 9001:2015 by organizations in the nuclear power supply chain that supply products and services important to nuclear safety" (certificate of conformity No. BY/112 05.14. 003.01 01553, valid until July 16, 2028).

Within the current IMS:

a policy in the field of IMS has been adopted, which sets out the obligations of top management to maintain and improve the IMS, and the goals in the field of IMS;

the organizational management structure and staffing table is defined;

the responsibility of the personnel is fixed (in the regulations on structural divisions, job/work instructions, organizational and administrative documents and other documents of the enterprise);

the Coordination council of the integrated management system has been created and is functioning, the main tasks of which are the coordination of the work of the enterprise within the framework of the integrated management system, maintenance in working order and continuously improvement of the integrated management system, monitoring of the implementation of decisions taken at meetings of the Coordination council;

by order of the General Director of the enterprise No. 710 dated September 02, 2024 "On the appointment of a management representative in the integrated management system", a management representative in the integrated management system of the enterprise was appointed;

by order of the General Director of the enterprise No. 585 dated July 22, 2024 "On the appointment of authorized representatives for the integrated management system", authorized representatives for the integrated management system were appointed to ensure the functioning of the Integrated Management System within the structural divisions of the enterprise;

IMS documents have been developed for various areas of the enterprise's activities (mission, vision, strategy and values, policies, enterprise standards, regulations, process passports, quality assurance programs (general quality assurance program NPP QAP (O), during operation of power units of the Belarusian NPP – NPP QAP (E) and others);

IMS processes are defined;

process owners and their responsibilities are defined;

process risks are analysed and assessed, risk registers and risk management programs for IMS processes are developed and periodically updated;

internal IMS audits are conducted, including inspections for compliance with quality assurance program requirements, with the preparation of relevant documents (programs, reports, corrective action plans);

external audits of supplier management systems are conducted, including inspections for compliance with quality assurance program requirements, with the preparation of relevant documents (programs, plans, reports, corrective action plans);

current IMS processes are monitored at established intervals;

management analysis is conducted;

measures to improve the IMS are determined on an ongoing basis.

13 (c) Audit program for organizations providing services for OO

Evaluation of the efficiency of quality systems of organizations providing services (suppliers) for OO is one of the aspects of activity in the field of quality of OO.

In order to verify the implementation of NPP QAP and evaluate their efficiency, OO and contractors conduct internal and external (in case of concluding contracts with subcontractors) audits of the implementation of quality assurance programs. The audit results are documented. Based on the audit results, corrective measures are developed to eliminate the identified non-conformities.

Control of quality assurance programs of suppliers for OO is carried out in the following areas:

document control (carried out to ensure that all documents used to perform and verify work are under constant control at the stage of preparation, approval, release and application);

design control (carried out in order to obtain a guarantee that the design documentation was prepared by design organizations licensed by national supervisory authorities for design, complies with the requirements of investment justifications for the construction of a nuclear power plant and regulatory documents, has undergone the necessary inspections, approval and examination; approved in accordance with the established procedure); control over deliveries (carried out to ensure that the supply of materials, equipment and services meets the requirements of regulatory legal acts, projects and specifications, work assignments and terms of the agreement/contract);

control of products (carried out to identify materials, equipment, products and their components during their manufacture, installation and use);

control of technological processes (carried out to ensure that all technological processes, the quality of which cannot be checked after installation is complete, are carried out properly and that possible violations that may lead to non-conformities in products, equipment and services are identified and eliminated at an early stage);

inspections and control over testing (inspection at any stage of the design, development and manufacture of equipment, construction, installation, commissioning and operation of NPPs; correctness of the technological process (its compliance with all requirements) and the quality of products and services); control over non-compliance with established requirements (carried out to control the correctness of the procedures for identifying non-conformities, timely documentation, accounting, analysis and elimination within the required timeframes, control over the elimination of non-conformities, identification of the causes of non-conformities, development of measures to prevent their recurrence). In addition, inspections of the general contractor for the construction of the Belarusian NPP and subcontracting organizations – licensees in the field of atomic energy use are carried out on a systematic basis on issues of the functioning of their quality management systems in terms of compliance with safety requirements. Inspections are usually carried out annually (taking into account the nature of the work performed by the licensee).

Summary of significant changes since the previous National Report

Since the publication of the previous National Report, the legislative requirements for quality assurance have been updated – both at the level of the Law of the Republic of Belarus and at the level of technical regulatory requirements in full compliance with the latest IAEA requirements.

The regulator has implemented procedures for overseeing the effectiveness of the OO IMS, including in terms of processes related to quality management.

The new requirements of the regulator regarding the functioning of the IMS (including quality management systems as processes (subsystem) of the IMS) have been fully implemented in the activities of the OO. In 2025, the OO implemented a quality management system that includes special requirements for the application of ISO 9001:2015 by organizations in the nuclear power supply chain supplying products and services important to nuclear safety in accordance with STB ISO 19443 “Quality management systems. Specific requirements for the application of ISO 9001:2015 by organizations in the nuclear power supply chain supplying products and services important to nuclear safety”.

ARTICLE 14. ASSESSMENT AND VERIFICATION OF SAFETY

Each Contracting Party shall take the appropriate steps to ensure that:

i) comprehensive and systematic safety assessments are carried out before the construction and commissioning of a nuclear installation and throughout its life. Such assessments shall be well documented, subsequently updated in the light of operating experience and significant new safety information, and reviewed under the authority of the regulatory body;

ii) verification by analysis, surveillance, testing and inspection is carried out to ensure that the physical state and the operation of a nuclear installation continue to be in accordance with its design, applicable national safety requirements, and operational limits and conditions.

Summary statement on the Article

In the Republic of Belarus, the regulatory documents establish and in practice implement the relevant measures to ensure that throughout the entire life cycle of the Belarusian NPP, comprehensive safety assessments are carried out, which determine the compliance of the current state of safety of the nuclear installation with the requirements of regulatory documents and documents justifying nuclear and radiation safety.

14 (i) Safety assessments

The legislation of the Republic of Belarus establishes requirements for conducting safety assessments both directly by the OO and by the regulatory body [2.2]. In particular, the OO conducts safety assessments and submits relevant documents based on their results to the regulatory body in the event of:

preparation and/or if it is necessary to amend the documents justifying safety assurance during each stage of the life cycle of a nuclear installation (within the framework of licensing procedures);

changes in the configuration of a nuclear installation, including during reconstruction, modification associated with a change in configuration, as well as significant changes to the IMS;

analysis of the current safety status of power units of the Belarusian NPP (carried out annually);

periodic safety assessment of a nuclear installation (carried out once every 10 years);

violations in the operation of a nuclear installation associated with the failure of systems and elements important to safety, or erroneous actions of workers;

In accordance with the Decree of the President of the Republic of Belarus [2.7], all stages of the life cycle of a nuclear installation, including design, siting, construction, operation and decommissioning, are subject to licensing. In addition, key sub-stages of commissioning NPP power units (including: the first delivery of nuclear fuel to the NPP site, the first loading of the standard core, subcritical reactor testing, performing physical experiments at a minimum controlled level, power start-up and trial operation) may begin only after the issuance of a permit by Gosatomnadzor to begin the relevant work. At the same time, in order to obtain the relevant license (make changes to it), as well as the permit from Gosatomnadzor to perform the work specified above, the license applicant (licensee) is obliged to submit to Gosatomnadzor a package of documents justifying nuclear and radiation safety. The list of such documents is established by the regulator [4.1] for each type of work (services) constituting the licensed activity. In 2023, the specified list was significantly expanded due to the inclusion of a number of operational documents that affect the nuclear and radiation safety of a nuclear installation. In particular, it was supplemented with such documents as: regulations for inspections and tests of safety-related systems; regulations for the maintenance and repair of safety-related systems; regulations for radiation monitoring, etc.

Gosatomnadzor carries out an assessment of the specified documents, which includes a safety review with the involvement of experts from the regulator's scientific and technical support organizations. The decision to appoint a safety review is made by Gosatomnadzor after a preliminary review of the documents submitted by the applicant, including determining whether their composition and content comply with the established requirements. The procedure for conducting a safety review is established by Government Resolution [3.6]. Safety reviews are conducted by expert organizations that have the appropriate licenses for the right to carry out activities in the field of using atomic energy and ionizing radiation sources. Gosatomnadzor posts on its official website on the global computer network the list of expert organizations and individual entrepreneurs entitled to conduct safety reviews, as well as a register of experts who have been granted the right to conduct safety reviews.

The results of the safety review are taken into account when making decisions on issuing a license. If discrepancies are found in the documents with the established regulatory safety requirements or their discrepancies with the actual state of the nuclear installation, they are subject to revision with a repeated safety review. When operating a nuclear installation based on the issued license, the OO ensures that periodic safety assessments of such an installation are carried out. The purpose of conducting a periodic safety assessment is to assess the safety status of a nuclear installation taking into account its operating lifetime, equipment aging, and to apply the results of such assessment to ensure safety for subsequent periods of operation of the nuclear installation, including when extending the service life of the nuclear installation (until the next periodic safety assessment or until the end of the service life of the nuclear installation). The results of the first periodic safety assessment of a nuclear installation should be submitted to Gosatomnadzor no later than 12 months before the expiration of 10 years from the date of commencement of its operation (with subsequent periodic safety assessments of the nuclear installation every 10 years).

The procedure for conducting a periodic safety assessment of a nuclear installation, as well as the requirements for the composition and content of documents containing the results of the periodic safety assessment, are established by regulatory requirements [4.5]. The requirements for conducting periodic safety assessments establish that each subsequent periodic safety assessment is conducted taking into account changes that have arisen since the previous periodic safety assessment, the requirements of regulatory legal acts, including mandatory technical regulatory legal acts, in the field of ensuring nuclear and radiation safety, the current state of the nuclear installation configuration, as well as taking into account the operating experience of the NPP power unit and all modifications implemented at the NPP power unit during the specified period.

The requirements of the licensing legislation [2.7] establish the need to conduct an annual current safety assessment of a nuclear installation, storage facility, disposal facility, or work (services) performed in the field of atomic energy use with the submission of a report to the regulatory authority. For the OO, as well as organizations performing work for the OO and providing services to the OO that affect nuclear and radiation safety, the requirements are established for the content of the report based on the results of such an assessment [4.10].

The OO report on the assessment of the current state of safety contains a set of safety indicators for the operation of the nuclear installation. In order to analyse the specified set of indicators and assess the dynamics of their change, Gosatomnadzor initiated and scientific and technical support organizations conducted a number of research projects. As a result, there was developed an electronic reference book that allows accumulating and analysing the indicators of safe operation of systems important for the safety of NPP power units. Such analysis allows early identification of NPP systems (elements) that may go beyond the operational limits and conditions of their operation. Comparative assessment of the dynamics of change in the values of individual indicators of safe operation allows identifying "problematic" indicators and focusing on more careful monitoring of the operation of systems (elements) associated with these indicators.

As part of the safety assessments, Gosatomnadzor engages experts from the regulator's scientific and technical support system on specific issues in the field of atomic energy use. Admission of experts in the field of nuclear and radiation safety and inclusion in the relevant register of experts is carried out by Gosatomnadzor in accordance with the established procedure [4.3].

To perform calculations related to safety assessments, the regulator's scientific and technical support system is provided with the necessary software products, including specialized software (calculation codes) “COCOSYS”, “ATHLET”, “ASTEC”, “DIN3D”, “Riskspektrum”, “Raduga”, “JRodos”, “Serpent”, “Recass-NT”.

Scientific and expert support of the OO in the area of safety assessments (development of analytical reports to support and improve the operation process, in particular, calculation and experimental support of the reactor core, management of the service life and ageing of NPP equipment, management of equipment defects, etc.) is one of the main areas of activity of the OO within the framework of the approach to continuous improvement of NPP safety. The relevant activities are included, among other things, in the program for maintaining and improving the safe operation of NPPs. Detailed information on the program is given in the item 6 (b).

Evaluation of equipment aging during operation

Requirements for the implementation of activities related to equipment ageing management during operation of the Belarusian NPP, including requirements for programs for ageing management of NPP components, are established in the standards and rules for ensuring nuclear and radiation safety [4.19].

Based on the established requirements, the OO has developed internal local procedures regulating the procedure for managing the ageing processes of safety-related components and structures (due to degradation, wear, corrosion, erosion, fatigue, and other mechanisms), as well as the procedure for monitoring and maintaining the operability and reliability of safety-related systems during operation.

As of June 2025, programs for managing the ageing processes of components for power units No. 1 and 2 and programs for managing the ageing of the main equipment of power units No. 1 and 2 have been developed and put into effect.

The criteria for the effectiveness and efficiency of the ageing management process are met. The following approaches form the basis of such criteria:

the actual condition of the elements and structures of power units No. 1 and 2, subject to ageing management, allows them to perform the functions assigned by the design;

the results of tests, measurements and monitoring performed during scheduled repairs, technical maintenance of elements and structures, correspond to the criteria established by the operational, design and regulatory documentation;

the values of the parameters characterizing the normal operating condition of the elements (such as pH, activity, temperature, pressure, current and voltage), as well as their deviations do not exceed the values established by the operational documentation;

the condition of the elements of power units No. 1 and, 2 of the Belarusian NPP complies with regulatory requirements;

failures in the operation of equipment and pipelines due to the degradation processes of safety-critical elements and structures (due to aging, wear, corrosion, erosion, fatigue, etc. mechanisms with untimely replacement or extension of service life) were not recorded.

During the operation of power units No. 1 and 2 of the Belarusian NPP, due to the absence of degradation processes that limit the possibility of operating the main equipment of the reactor plant, technical solutions related to the degradation processes of safety-critical elements and structures of the Belarusian NPP power units (due to aging, wear, corrosion, erosion, fatigue, etc.) were not developed.

Information on the aging management of elements of power units No. 1 and 2 of the Belarusian NPP is provided to the regulatory authority, where it is used in the implementation of regulatory supervision.

Modifications at nuclear power plants. Safety assessments of modifications

Requirements for the implementation of activities related to the implementation of modifications at nuclear power plants and the assessment of their safety during commissioning and operation of NPPs, including the procedure for developing and implementing modifications at NPPs, modification categories depending on their impact on NPP safety, as well as the procedure for submitting reports during the development and implementation of modifications, are established by the standards and rules for ensuring nuclear and radiation safety [4.16], as well as special licensing requirements and conditions of a special permit (license) for the OO.

Based on the specified requirements, the OO has developed internal local procedures regulating the procedure for organizing the planning and implementation of modifications to the systems and equipment of a nuclear power plant, as well as the procedure for developing and preparing documentation for permanent and temporary modifications.

The OO ensures that safety assessments of temporary and permanent modifications are carried out in accordance with internal local procedures.

During the operation period from 2022 to 2025, 188 technical solutions for permanent modifications were developed at power units No. 1 and No. 2 of the Belarusian NPP, including 102 technical solutions affecting safety. Additionally, during the above-mentioned period, 84 temporary modifications were implemented at power units No. 1 and No. 2.

Information on temporary and permanent modifications is provided to the regulatory authority, where it is used in the implementation of regulatory supervision.

14 (ii) Safety verification

The following requirements are established by the standards and rules for ensuring nuclear and radiation safety [4.14 and 4.15]:

systems and components of the NPP power unit important to safety should undergo direct and complete testing for compliance with the design characteristics upon their commissioning, after repair, maintenance or modification, and periodically throughout the entire service life of the NPP power unit;

the design of the NPP power unit should provide for the possibility of technical diagnostics (checking) of the condition of the safety systems, special technical means for controlling the BDBA, as well as safety-important elements of normal operation classified as safety classes 1 and 2, and the possibility of their representative testing;

in order to maintain the operability of the safety systems and prevent failures in the systems important to safety, their maintenance, repair, testing and inspection should be carried out.

At the request of Gosatomnadzor, the OO should conduct unscheduled inspections of the operability of the safety systems, special technical means for controlling the BDBA, as well as unscheduled monitoring of the condition of the base metal and welded joints of the systems and components of the NPP power unit important to safety.

Operation (internal) inspections carried out by the OO during the operation period

In order to inspect at any stage of the process of design, development and manufacture of equipment, construction, installation, commissioning and operation of power units of the Belarusian NPP, the correctness of the technological process (its compliance with all requirements) and the quality of products and services, the OO should exercise control by carrying out inspections.

At the State Enterprise “Belarusian NPP” operation inspections (scheduled, targeted, unscheduled) are carried out in relation to nuclear, radiation, technical, industrial and fire safety in the structural divisions of the Sate Enterprise “Belarusian NPP”.

Scheduled inspections are carried out in accordance with the developed schedule of operation inspections of compliance with safety requirements, the inspection program, and include inspections of the documentation of the structural division, inspections of assigned premises, inspections of workplaces, interviews with personnel. Unscheduled inspections are provided for upon receipt of information about violations of safety requirements. As part of targeted inspections, control over the performance of a specific operation by personnel, equipment testing, etc. can be carried out.

In order to monitor the state of nuclear safety at the State Enterprise “Belarusian NPP”, a commission of employees of the nuclear safety department carries out internal inspections of the state of nuclear safety in the structural divisions of the enterprise, self-assessment of operational safety in the nuclear safety department, inspections of the state of nuclear safety at the Belarusian NPP by an internal commission (once every 2 years). The results of the inspections are submitted to the regulatory body.

A commission of employees of the radiation safety operating department carries out operation inspections of the state of radiation safety in the structural divisions of the State Enterprise “Belarusian NPP”, as well as inspections of compliance with the requirements of regulatory legal acts, including technical regulatory legal acts, in the field of radiation safety, by subcontracting organizations performing work on the site of the Belarusian NPP. Unscheduled radiation safety inspections are provided for when detecting cases of exceeding the dose limits of personnel, the population when handling IRS, when exceeding the permissible levels of emissions, discharges of radioactive substances into the environment at NPP facilities and divisions, as well as in involved (providing services to the OO) organizations. This type of inspection involves checking individual issues of ensuring the radiation safety of the NPP and is carried out directly at workplaces in order to promptly take measures to prevent violations of radiation safety requirements and eliminate the identified deficiencies.

Inspections of compliance with technical, industrial and fire safety requirements are carried out by the technical inspection department of the OO. The results of the inspections are recorded in the relevant acts.

Violations identified during production inspections are eliminated within the established time frame.

The State Enterprise “Belarusian NPP”, as the operating organization, taking into account international experience, has created a Safety inspection and control department (hereinafter referred to as the SICD) to perform independent (inspection) control functions at the enterprise. Since October 2024, the SICD has been staffed with the necessary personnel. An Action Plan for the establishment and functioning of the SICD has been developed and approved, in accordance with which the necessary documentation for the functioning of the department is developed. The main functions of the SICD are:

organizing and conducting safety inspections of NPP;

recording and making control over the implementation of the instructions of Gosatomnadzor, State Production Association “Belenergo” (an organization superior to the OO);

monitoring the elimination of violations identified by the bodies of the internal control system of NPP safety;

conducting inspections of compliance by contractors with the requirements for ensuring NPP safety included in the contract;

analysis of violations of the requirements of regulatory legal acts, technical regulatory legal acts in the field of safety, development of recommendations and proposals for eliminating the causes of identified violations, increasing the level of safety, and organizing preventive work.

Information on control and supervisory activities by the regulatory body is presented in Articles 7, 10 and 19 of this report.

Inspections carried out by the regulatory body during the operation period

All aspects of the Belarusian NPP activities listed in this article are included in the regulatory authority's supervision programs at the NPP site, namely, in the general programs in the thematic areas of “Ensuring operational safety and taking into account operating experience” and “NPP design management”. More detailed information on the forms of supervision at the NPP site and the system of Basic and General Supervision Programs is provided in Article 7.

Peer reviews by external organizations

In addition to the safety assessment system established by national legislation, the Republic of Belarus also uses available tools in the context of interaction with international organizations. In particular, the country has conducted the necessary IAEA missions (including OSART missions). In addition, as a member of the World Association of Nuclear Operators, the Belarusian NPP requests and accepts peer reviews in accordance with the established procedure, implementing all measures proposed by partners aimed at improving the safety level. In order to comprehensively and objectively assess the safety margins of the NPP in 2016-2018, the Republic of Belarus voluntarily conducted stress tests of the Belarusian NPP (a target assessment of the NPP's resistance to extreme external natural impacts and their combination in the light of the accident at the Japanese NPP "Fukushima-Daiichi") according to the ENSREG procedure and underwent a peer review of their results by ENSREG. More detailed information is provided in Article 6.

IAEA OSART missions

In accordance with the plan of interaction of the state enterprise Belarusian NPP with the IAEA, a pre-OSART mission and follow-up mission on operational readiness issues took place in 2019 and 2021.

Following the results of the pre-OSART follow-up mission at the Belarusian NPP site, IAEA experts gave a positive assessment of the effectiveness of the work performed by the Belarusian NPP employees in the period from 2019 to 2021. Positive conclusions were received for all 19 recommendations and proposals previously issued by IAEA experts ("Satisfactory progress to date" or "Problem resolved"). These conclusions are reflected in the IAEA mission report.

From 22 to 25 April 2025, IAEA experts visited the site of the State Enterprise "Belarusian NPP" to hold a preparatory meeting for the IAEA OSART mission, which, in accordance with the plan of interaction between the Belarusian NPP and the IAEA, will be held at the site of the Belarusian NPP in 2026.

WANO peer reviews

As a part of the interaction between the State Enterprise "Belarusian NPP" and WANO (Moscow Center) (hereinafter referred to as WANO-MC), a pre-start peer review was conducted at the Belarusian NPP site from November 27 to December 10, 2021 to assess the plant's readiness for the safe start-up and operation of the new power unit No. 2 and to assess the initial stage of operation of power unit No. 1.

In accordance with the Interaction Plan between the State Enterprise Belarusian NPP and WANO-MC, the following were conducted at the Belarusian NPP site:

from May 15 to May 31, 2024, a scheduled WANO-MC peer review of the implementation of recommendations specified in the notices of significant operating experience (hereinafter referred to as SOER);

from March 10 to March 26, 2025, the first operational peer review. The repeated operational peer review by the WANO-MC expert team at the Belarusian NPP state enterprise is scheduled for the period from 10 to 14 November 2025.

International insurance inspections (if any)

No international insurance inspections were carried out during the reporting period.

Summary of significant changes since the previous National Report

Since the publication of the previous National Report, the list of documents justifying safety subject to safety assessment within the framework of safety review procedures has been expanded.

The regulatory body updated the requirements for conducting annual assessments of the current safety of NPP units. 5 safety guides containing recommendatory provisions on various aspects of resource management of equipment important to safety have been published.

The organizational and legal foundations of the expert assessment system in the Republic of Belarus have been further improved. The regulatory body has improved approaches to admitting experts to participate in conducting safety reviews of various aspects of the plant's operations.

The OO has made organizational and staffing changes aimed at improving the internal safety control system of the OO. A number of safety peer review have been conducted by WANO.

ARTICLE 15. RADIATION PROTECTION

Each Contracting Party shall take appropriate steps to ensure that in all operational states the radiation exposure to the workers and the public caused by a nuclear installation shall be kept as low as reasonably achievable and that no individual shall be exposed to radiation doses which exceed prescribed national dose limits.

Summary statement for the Article

The Republic of Belarus takes all necessary measures to ensure radiation protection. Legislative requirements in the field of radiation safety comply with the IAEA safety standards and modern international approaches. Their application in the implementation of the Belarusian NPP design allows for the exposure of personnel and the population to be kept at a reasonably low level. The system of monitoring and control and supervisory measures both at the level of the OO and at the level of responsible government bodies is sufficient for an objective assessment of compliance with the established standards.

15 (a) Regulatory requirements

The basic principles and requirements for ensuring radiation protection are defined in the laws of the Republic of Belarus [2.1, 2.2].

Radiation safety requirements for situations of planned, emergency and existing exposure are established by the Sanitary rules and regulations “Radiation safety requirements” and “Requirements for radiation safety of personnel and population in exercising activities on the use of atomic energy and ionizing radiation sources” [4.28, 4.30], as well as the Hygienic standard “Criteria for assessing radiation exposure” [3.17]. This standard has been revised in accordance with the IAEA requirements “Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards. General Safety Requirements Part 3” and “Preparation and Response for a Nuclear or Radiological Emergency. General Safety Requirements Part 7”. The hygienic standard contains the concept of a representative person (in accordance with Publication 101 of the International Commission on Radiological Protection), defines the use of dose limits and reference levels, defines levels of exemption from and clearance from regulatory control, establishes general response criteria and current intervention levels in the event of a nuclear and radiological emergency, criteria for the radiation protection of emergency workers, and introduces reference levels of radionuclide content in drinking water.

Sanitary norms, rules and hygienic standards “Hygienic requirements for the design and operation of nuclear power plants” [4.29] establish requirements for ensuring the radiation safety of personnel, the population and environmental protection during the siting, design, construction, commissioning and operation of nuclear power plants. NPP radiation safety is ensured by implementing a set of special measures:

establishing and fulfilling radiation safety requirements at the industrial site of the nuclear power plant and adjacent territories;

monitoring the condition of the protective barriers of the nuclear power plant on the path of propagation of ionizing radiation and radioactive agents;

localization of radiation sources and protection of personnel and the public during normal operation and in the event of an accident at a nuclear power plant.

The content and scope of special measures are provided in the design and operating documentation of the nuclear power plant.

The requirements and approaches recommended by the IAEA safety standards series publications are also taken into account in the following documents:

Sanitary norms and rules “Requirements for Radiation Safety of Personnel and Population in Exercising Activities on the Use of Atomic Energy and Ionizing Radiation Sources” [4.30.];

Regulation on the procedure and criteria for classifying radioactive waste as radiation hazard classes [3.5];

Regulation on the procedure for developing and approving standards for acceptable emissions and discharges of radioactive substances into the environment [3.5];

Norms and rules for ensuring nuclear and radiation safety “Safety in ionizing radiation sources management. General provisions” [4.20];

Norms and rules for ensuring nuclear and radiation safety “Safety rules for management of radioactive waste from nuclear power plants” [4.21]. The document establishes safety requirements implemented in the design and operation of RW management systems at NPPs;

Sanitary norms and rules “Requirements for radiation safety of personnel and population in radioactive waste management” [4.31]. The document has been developed in line with the requirements of IAEA Safety Standards Series No.GSG-1 and No.SSR-5;

Norms and rules for ensuring nuclear and radiation safety “Nuclear power plants safety in the sanitary protection zone and the supervised area. Requirements for the organization and provision of radiation monitoring” [4.22];

Norms and rules ensuring for nuclear and radiation safety “Safety in ionizing radiation sources management. General provisions” [4.23];

Regulation on the procedure for accounting exposure received by the population and personnel [4.13];

Instruction on the procedure for accounting and control of ionizing radiation sources Instruction on the procedure for accounting and control of ionizing radiation sources [4.7].

15 (b) Expectations in accordance with the regulatory provisions regarding the processes performed by the license holder to optimize exposure and implement the principle of “as low as reasonably achievable” (ALARA)

The priority of using the ALARA methodology is established by the Law of the Republic of Belarus “On Radiation Safety” [2.1], norms and rules for ensuring nuclear and radiation safety, sanitary rules and standards. The main regulatory requirements that should be followed in normal operation of ionizing radiation sources and facilities for the use of nuclear energy are:

non-exceeding, in the situation of planned exposure (with the exception of medical exposure), the limits of doses of occupational exposure and exposure of the population from all IRS (the principle of rationing);

the prohibition of IRS management activities at which benefits received for a human and society do not exceed the risk of possible harm caused by radiation exceeding the natural radiation background (the principle of justification);

maintaining at the lowest achievable level the individual radiation doses and the number of exposed persons, taking into account economic and social factors, when using any sources of ionizing radiation (the principle of optimization).

To ensure the implementation of the principle of radiation safety optimization, in 2020, a Regulation on the procedure for establishing and applying dose constraints and reference levels (Order of the Ministry of Health of the Republic of Belarus No. 88 of August 31, 2020) was developed and put into effect, defining liabilities and requirements for establishing radiation dose limits and reference levels by nuclear energy use facilities and IRS users.

The dose constraints of the population are established by state sanitary supervision institutions for the value of the individual effective radiation dose of a representative person for the following facilities discharge radioactive substances into the environment:

radiation facilities with radiation exposure received by the population exceeding 10 mSv/year through all exposure routes;

facilities for the use of atomic energy.

The dose limits for personnel are established by the users of the IRS in agreement with the state sanitary supervision institutions. The values of the dose limits may be revised at the initiative of the state sanitary supervision institutions or the OO, taking into account the possibility of further reducing the doses of the population or professional exposure by implementing measures to optimize radiation protection.

Based on the non-exceedance of the radiation dose limits, a system of controlled parameters has been introduced that are derived standards from the dose limits. The user of the IRS (OO) is obliged to ensure the development of controlled parameters of the impact of the radiation factor at the radiation facility and in the supervised area, established for operational radiation monitoring of compliance with dose limits, ensuring that the doses of personnel and the population are not exceeded, and radioactive contamination of the environment is not exceeded.

15 (c) Implementing the Belarusian NPP radiation protection program by license holders

Currently, power units No. 1 and 2 of the Belarusian NPP are at the stage of commercial operation. Monitoring of radiation safety and limitation of personnel exposure includes a set of organizational, technical and informational measures and is carried out on an ongoing basis taking into account the ALARA methodology.

The radiation protection program at the Belarusian NPP includes the following documents:

Radiation Safety Policy of the Belarusian NPP;

Quality Manual;

The procedure for organizing and implementing industrial control over radiation safety at the State Enterprise "Belarusian NPP";

Regulations for interaction between the Customer and the involved organization to ensure radiation safety of the Belarusian NPP at the stage of commercial operation;

Regulations for radiation monitoring of the Belarusian NPP;

Instructions for radiation safety during operation of the Belarusian NPP;

Instructions for improving and optimizing radiation protection.

The specified documents cover all elements of the radiation protection program, which are given in the IAEA recommendations GSG-7 "Occupational Radiation Protection".

15 (d) Compliance with the dose limits, main results regarding the doses received by the exposed workers

At the Belarusian NPP, individual dosimetric monitoring and accounting of radiation doses received by both the personnel of the State Enterprise "Belarusian NPP" and external (including contractor) organizations is organized.

Information on the radiation doses of the personnel of the State Enterprise "Belarusian NPP" and external (contractor) organizations received during the performance of work on the operation of power unit No. 1 and the commissioning and operation of power unit No. 2 are given in Table 15.1

Table 15.1

Year	Collective dose, person*mSv	Average individual dose, mSv	Maximum individual dose, mSv
2021	436,509	0,150	4,983
2022	1883,489	0,446	12,356
2023	986,478	0,256	7,107
2024	954,817	0,294	6,485
2025 (first half of the year)	489,871	0,203	1,206

15 (e) Conditions for the release of radioactive materials into the environment

Based on terms of reference for the Belarusian NPP in the Republic of Belarus for the emissions and discharges into the environment during normal operation and violations of normal operation, taking into account the achieved level of safety in the existing NPPs with WWER reactors, the following target limits are set:

the annual gas-aerosol emission of IRG into the environment during normal operation and violations of normal operation should not exceed 40 TBq per power unit per year;

the annual emission of aerosols and iodine into the environment during normal operation and violations of normal operation should not exceed 0.8 GBq per power unit per year;

the annual discharge of radionuclides (excluding tritium) during normal operation and violations of normal operation should not exceed 10 GBq per power unit per year.

In order to prevent exceeding the limit of the dose of man-made radiation to the population, Sanitary norms and rules [4.29], as well as [4.28] established a quota (dose constraints) for the exposure of the population from the impact of the Belarusian NPP – 100 mSv per year. This quota (dose constraints) is set for the total exposure of the population from all sources of radioactive gas-aerosol emissions into the atmospheric air and liquid discharges into surface waters, regardless of the number of power units at the industrial site. At the same time, the quota value is considered as the upper limit of the possible public exposure from radioactive emissions and discharges from the NPP while optimizing radiation protection of the population during normal operation of the NPP. The values of the corresponding dose constraints for public exposure are used to calculate the maximum acceptable emissions of radionuclides of nuclear power plants into the atmospheric air and the maximum acceptable discharges of radionuclides into surface waters. Maximum permissible emissions and maximum permissible discharges are the upper limits for gas aerosol emissions and liquid discharges of radionuclides into the environment during normal operation of the NPP.

The procedure for developing and approving standards for permissible emissions and discharges of radioactive substances into the environment has been approved by a Resolution of the Council of Ministers [3.5].

In order to limit emissions and discharges of radioactive substances into the environment, the Belarusian NPP design provides for radiation monitoring at all routes of entry of radioactive substances into the environment, comparison of measured values with permissible levels and prevention of discharge in case of their excess.

The design also implements the following additional measures:

organization of gaseous emissions of the plant into the atmosphere through a 100 m high ventilation stack after preliminary cleaning, ensuring a high degree of reduction in the concentration of radionuclides in the atmosphere;

discharge of purified liquid media from the NPP only through control tanks with mandatory radiation monitoring;

cleaning of liquid and gaseous radioactive media, and exhaust air from ventilation systems of the controlled access zone before their discharge/release from the NPP;

conducting radiation control and monitoring in the observation zone, which is installed around the NPP;

other measures.

15 (f) Processes and measures implemented to ensure that radiation exposure is maintained at reasonably achievable low level in all operational stages

A number of organizational and technical measures to ensure radiation safety have been implemented at the Belarusian NPP. In order to most effectively implement the policy of optimization and improvement of radiation protection, a management structure – the permanent ALARA Committee has been created at the Belarusian NPP state enterprise that coordinates and manages the radiation protection system at all stages of practical activities.

Functions of the ALARA Committee:

establishment and approval of annual planned indicators of individual and collective doses (annual dose quotas);

review and approval of annual and prospective measures to reduce individual and collective doses, as well as to increase the level of radiation protection;

review of facts of exceeding the established values of the dose limit, facts of exceeding the established values of the collective dose quotas.

During commercial operation of power units No. 1, 2 of the Belarusian NPP, maintaining radiation doses at a reasonably achievable low level is carried out due to:

- reducing the quantity of radioactive substances in all the media of the NPP technological systems;
- reducing emissions and discharges of radioactive substances into the environment;
- optimization of the number of personnel involved in the work;
- determination of dose-intensive work and organization of its realization in accordance with the programs for the carrying out of radiation-hazardous work;
- formation and maintenance of an appropriate level of personnel safety culture with respect to activities involving handling sources of ionizing radiation, as well as activities affecting radiation safety;
- control over the mandatory use of personal protective equipment;
- decontamination of equipment and premises based on the results of radiation monitoring in order to reduce radioactive contamination levels to the lowest possible;
- determination of places with low ambient dose equivalent rate indicators to familiarize personnel with the upcoming work, to prepare for the performance of work and organize breaks in work (green zones);
- reduction of radioactive contamination of equipment and premises in the controlled access zone;
- use of protective screens, remote monitoring/work execution systems;
- conducting an operational detailed analysis of the formation of personnel radiation doses;
- developing memos on compliance with radiation safety requirements when performing certain types of work;
- reducing the volume of radioactive waste formation;
- conducting a survey of workshops and other sites of permanent presence of personnel for the purpose of regular monitoring and improvement of the radiation situation in them, as well as other organizational and technical measures.

In order to implement the optimization principle, a dose limit has been established at the Belarusian NPP, the values of which are lower than the main limit of radiation dose. Additionally, in order not to exceed the dose limit, criteria for controlled radiation parameters (control levels) have been established.

To perform work during which personnel may receive an individual effective radiation dose of more than 0.2 mSv, a permit for the performance of this work (dosimetric order) is issued, during the preparation of which the measures to ensure radiation safety are indicated. Each issued dosimetric order is assigned a classification code with a description of the equipment on which the work is performed, a description of the work performed. The database of classified orders allows analyzing collective and individual doses of personnel and subsequently forming measures to optimize them.

15 (g) Radiation monitoring of the environment

In accordance with the Regulation on the procedure for conducting radiation monitoring as a part of the National Environmental Monitoring System in the Republic of Belarus and using its data [3.15], the State Institution "Republican Center for Hydrometeorology, Radioactive Contamination Control and Environmental Monitoring" of the Ministry of Natural Resources and Environmental Protection (Belhydromet) ensures that radiation monitoring is conducted at 120 observation points for environmental objects throughout the country. Since 2017 – also in the area of the Belarusian NPP.

The network of RM observation points in the impact zone of the Belarusian NPP was created to monitor its operation, timely detect changes in the radiation situation, assess and predict possible consequences of radiation exposure on public health and the environment, as well as (if necessary) promptly take measures to prevent or reduce radiation exposure.

The RM objects are:

atmospheric air;

surface waters (including bottom sediments);

underground water;

soil.

The network of RM observation points in the area of the Belarusian NPP location includes stationary observation points for the radioactive aerosols presence in the air with sampling by means of filter ventilation units at the weather stations closest to the Belarusian NPP: Lyntupy, Oshmyany, Naroch. Since 2017, observations of the radioactive contamination of surface waters have been implemented at three observation points: Viliya river (Bystritsa village), Lake Svir, Lake Naroch. RM of soils is performed at four observation points: Bystrica (Bystritsa locality), Kemelishki (Kemelishki locality), Gudogai (Gudogai village), Svir (Svir village). Observations at these points are performed by the following parameters:

atmospheric air: measurement of the ambient dose equivalent of gamma radiation, total beta activity, activity of gamma-emitting radionuclides, activity of strontium-90;

surface waters: measurements of total alpha and beta activity, activity of caesium-137, strontium-90; measurement of activity of caesium-137, strontium-90 in bottom sediments;

soil: measurement of the ambient dose equivalent rate of gamma radiation, layer-by-layer distribution of the activity of cesium-137 and strontium-90 in the soil at a depth of 10 cm with a step of 1 cm.

The monitoring results obtained to date show that the levels of radioactive contamination of the components of the natural environment in the area of the Belarusian NPP correspond to the levels of global fallout of radionuclides due to nuclear weapons tests in the 1960s, observed before the accident at the Chernobyl NPP, taking into account their natural decay.

15 (h) Belarusian NPP

The requirements for the operating organization to conduct RM are established by the Laws of the Republic of Belarus [2.1 and 2.2.], as well as the norms and rules for ensuring nuclear and radiation safety [4.22].

The purpose of conducting RM of the environment is to assess the radiation situation in the sanitary protection zone and the observation zone, as well as to establish trends in its change under conditions of normal (accident-free) operation of the Belarusian NPP.

The main objectives of RM of the environment are:

continuous systematic monitoring of the level of radioactive contamination of environmental objects in the sanitary protection zone and the supervised area;

obtaining the necessary, sufficient and reliable information on the radiation situation in the sanitary protection zone and the supervised area;

assessment of the current state of RM objects of the environment in the sanitary protection zone and the supervised area and analysis of the dynamics of its change;

assessment of radiation doses to the population living in the supervised area;

forecasting changes in the radiation situation in the sanitary protection zone and SA;

collection, generalization and transfer to interested bodies and departments of information on the radiation situation and the state of environmental objects in the sanitary protection zone and SA and the forecast of its change.

In accordance with the requirements of the legislation, the operating organization carries out radiation monitoring in relation to the following environmental objects:

aerosols in surface atmospheric air;
atmospheric precipitation, including snow cover;
surface waters;
groundwater, including potable water;
bottom sediments;
aquatic and coastal aquatic vegetation;
ichthyofauna, including predatory and bottom commercial fish species;
soils, including arable and meadow lands;
ground vegetation;
components of agricultural ecosystems and agricultural products.

In order to continuously monitor the radiation situation in the Belarusian NPP's SA in all operating modes of the NPP, including design basis and beyond design basis accidents, as well as to predict the impact of increased gas and aerosol emissions from the NPP into the environment, the Automated radiation environment monitoring system (AREMS) of the Belarusian NPP operates.

The AREMS includes 10 radiation monitoring posts, 1 automatic meteorological station, 2 mobile radiometric laboratories, and 7 filter and ventilation units. At the same time, 9 radiation monitoring posts are located in the SA of the Belarusian NPP (the localities of Vornyany, Vorona, Podoltsy, Rymdyuny, Goza, Chekhi, Markuny, Chernishki, Olkhovka), and 1 radiation control post has been organised outside the SA territory and is located in the locality of Svir (Minsk region, Myadel district).

The AREMS radiation monitoring posts in the localities of Vornyany, Goza, Chekhi, and Markuny are additionally equipped with spectrometric sensors designed to identify the radionuclide composition of the gas-aerosol emission of the Belarusian NPP

The design documentation for the Belarusian NPP AREMS provides for and implements the exchange of data on the radiation situation with the Belhydromet AREMS.

To predict the impact of increased gas-aerosol emission of the NPP into the environment, the RECASS system of information support for decision-making is applied as a part of the AREMS. This system allows calculating the content of radioactive substances in the atmospheric air and on the underlying surface, the values of dosimetric quantities characterizing the impact of radioactive substances on the population during the emission, and determining the zones for implementing measures to protect the population, taking into account current standards and decision-making criteria in the initial period of a radiation accident.

The analysis of the dynamics of changes in the radiation situation is performed by comparing the results of measurements of the monitored parameters with the established standard and reference levels, the results of the assessment of the “zero” radiation background and similar radiation parameters for each object of radiation monitoring obtained for previous observation periods.

Every year, the OO submits to Gosatomnadzor a “Report on the results of radiation monitoring of the environment in the sanitary protection zone and the observation zone of the Belarusian NPP”.

Up-to-date information on the state of the radiation situation in the observation zone of the Belarusian NPP is posted on the global Internet on the official website of the State Enterprise “Belarusian NPP” (https://www.belaes.by/ru/radiatsionnaya-obstanovka).

The results of radiation monitoring in the supervised area of the Belarusian NPP indicate that the radiation situation in the area of the Belarusian NPP remains stable. The levels of radionuclides in the components of the natural environment, agricultural ecosystems and agricultural products are significantly lower than the established standard values and correspond to the levels of “zero” radiation background recorded at the stage of construction and commissioning of the Belarusian NPP. The radiation doses of the population living in the SA of the Belarusian NPP do not exceed the established dose limits.

15 (i) Regulatory review and control activities

The objectives and procedure for implementing regulatory review and control are defined in Chapter 7 of the Law of the Republic of Belarus “On Radiation Safety” [2.1].

State supervision in the field of radiation safety is organized and implemented for the purpose of preventing, detecting, and suppressing violations of radiation safety legislation, and includes supervision of compliance with radiation safety requirements established by legislative acts, regulatory legal acts of the Council of Ministers of the Republic of Belarus, the Ministry for Emergency Situations, and the Ministry of Architecture and Construction. Detailed information is provided in the item 7.2 (iii).

State sanitary supervision in terms of radiation safety is carried out in the manner established by the legislation on control (supervisory) activities and the legislation in the field of sanitary and epidemiological welfare of the population, and includes supervision of compliance with sanitary and epidemiological requirements, hygienic standards, and other legislative acts in the field of sanitary and epidemiological welfare of the population, including exposure to ionizing radiation during work with IRS and radioactive waste management. In the implementation of state supervision in the field of radiation safety, state sanitary supervision in terms of ensuring radiation safety, a graded approach is used, which consists in applying supervision measures proportionate to the degree of radiation hazard of the source of ionizing radiation, including the risk to the life and health of personnel and the population.

The procedure for conducting regulatory assessments and implementing regulatory control is described in Articles 7 and 14.

Summary of significant changes since the previous National Report

There have been no significant changes in the radiation protection system since the publication of the previous National Report.

ARTICLE 16. EMERGENCY PREPAREDNESS

1. Each Contracting Party shall take the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency.

For any new nuclear installation, such plans shall be prepared and tested before it commences operation above a low power level agreed by the regulatory body.

2. Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.

3. Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency.

Summary statement for Article

The Republic of Belarus takes all necessary measures to ensure emergency preparedness and response. Off-site and on-site emergency plans have been developed, tested, resourced and regularly checked. The system of emergency preparedness and response to nuclear and radiation accidents has been created in accordance with the international requirements of the IAEA, as well as taking into account internationally recognized approaches (including the HERCA-WENRA approach). This system has been implemented in the national response system.

The Republic of Belarus has taken measures to create tools for disseminating information along the line of emergency preparedness and response – both in advance (including through the media, websites of relevant government agencies and organizations), and through a centralized system for warning the population in case of the need to take specific protective measures. The population of neighbouring countries is notified in the established manner through contact points in such countries – as part of the fulfilment of international obligations enshrined in the relevant international treaties. Before making important decisions related to issuing a license to operate each of the NPP power units, the regulator held public hearings, during which special attention was paid to issues of information and readiness to promptly take measures to protect the population in the event of an accident at the NPP.

16.1 Emergency plans and programs

16.1 (a) Regulatory requirements

The legislation defines the requirements for the development of measures to ensure emergency preparedness and emergency response in the event of accidents at nuclear installations [2.2]. Measures to ensure emergency preparedness and emergency response in the event of accidents at nuclear installations are established by off-site and on-site emergency plans [3.2].

The regulatory requirements for emergency preparedness and response are established taking into account modern international approaches, including those set out in the IAEA safety standards GSR Part 7. Requirements are established for the categorization of emergency planning in the event of a nuclear or radiological emergency [4.24]. A graded approach to the development of emergency planning measures has been introduced depending on the hazard category of the facility (practical activity). Requirements are established for the composition and content of action plans in the event of an accident at a nuclear power plant [4.25].

Regulatory requirements for establishing the emergency class, the procedure for declaring an emergency, and promptly transmitting information in the event of a nuclear and/or radiation emergency at a nuclear power plant have been developed taking into account IAEA documents and implemented [54]. The document takes into account the approaches of IAEA outlined in the Safety Standards GSR Part 7 “Preparedness and Response for a Nuclear or Radiological Emergency”, GSG-2 “Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency”, and GS-G-2.1 “Arrangements for Preparedness for a Nuclear or Radiological Emergency.” Following the IAEA recommendations, an approach has been implemented to classify emergencies based on technological and radiation parameters analysis. In order to identify, accept and establish the emergency class in a timely manner, requirements have been introduced to determine specific, predetermined and observed criteria - levels of actions in emergency situations.

The Resolution of the Ministry for Emergency Situations established requirements for the OO for planning and implementing RM in the event of a nuclear or radiological emergency at a nuclear power plant [4.27].

16.1 (b) Implementation of measures to improve emergency preparedness

In the Republic of Belarus, the system of preparedness for response to nuclear and radiation accidents is integrated into the National Emergency Response System. State Emergency Prevention and Control System of the Republic of Belarus (SEPCS) has been created and is operating. The main requirements for this system are defined in [2.4, 3.12].

For the Belarusian NPP, off-site and on-site emergency plans have been developed, approved and are periodically tested during emergency drills and training.

The Off-site Emergency Plan has been developed in order to organize and ensure timely measures to protect the population and territories in the event of a threat or occurrence of emergency situations at the Belarusian NPP associated with the release of radioactive substances beyond its industrial site. When developing the plan, international emergency response standards contained in the documents of the IAEA, the Association of the Heads of the European Radiological Protection Competent Authorities (HERCA) and the Western European Nuclear Regulators Association (WENRA) have been taken into account.

Off-site Emergency Plan established:

a list of measures to ensure emergency preparedness and emergency response in the event of nuclear and radiation accidents at the Belarusian NPP at the national level;

coordination and interaction mechanisms of the republican bodies of state administration, local authorities, governmental and other organizations, citizens in implementing measures to protect the population and territories in the event of nuclear and radiation accidents at the Belarusian NPP;

measures to protect the population and territories in the event of nuclear and radiation accidents at the Belarusian NPP;

emergency response zones and actions of republican bodies of state administrations, local government and self-government bodies, state and other organizations, citizens in order to protect their life and health, environmental protection and property protection in the event of nuclear and radiation accidents at the Belarusian NPP.

The On-site Emergency Plan provides for the scope, timing and procedure for implementing measures to protect NPP personnel in the event of a threat of a man-made emergency, organizing and conducting emergency rescue and other urgent work, as well as attracting forces and resources for this purpose.

In order to maintain readiness for the implementation of the On-site Emergency Plan, emergency drills and training are regularly conducted at the Belarusian NPP. Emergency drills and training are conducted regularly in accordance with annually prepared plans.

Gosatomnadzor monitors and evaluates the effectiveness of emergency drills and exercises, as well as prepares proposals for their improvement. In 2024, methodological recommendations were updated, which introduced quantitative criteria for assessing the effectiveness of emergency drills and exercises.

Readiness for the implementation of Off-site Emergency Plan activities is checked annually. At the same time, at least once every five years, each event of the off-site emergency plan is practically worked out during trainings.

Thus, within the framework of international exercises with rescue units of the CSTO member states “Skala-2023” on September 4, 2023, at the site of the Belarusian NPP and the territory of the Ostrovets district of the Grodno region, the issues of ensuring nuclear and radiation safety of the population were worked out with the introduction of on-site and off-site emergency plans. During the command and staff exercise on October 23-24, 2024, the Off-site Emergency Plan of activities were worked out in terms of:

providing medical assistance to personnel and the population affected by the accident at the Belarusian NPP, making a decision on protective measures and other response measures;

monitoring the radiation situation to protect the population, territories and hydrometeorological support for the organization of radiation protection of the forces and means involved in emergency response.

In the first half of 2025:

test command and staff exercises were conducted to work out information and analytical support for making management decisions in nuclear or radiation accidents with partial formation of the entire vertical of management bodies of the information and control system of the SEPCS of the national level (April 30, 2025);

took part in the large-scale international emergency response exercise ConvEx-3 (2025), organized by the IAEA on the basis of national exercises at the Cernavoda NPP in Romania (June 24-25, 2025).

Also for 2025, it is planned to carry out a comprehensive exercise to practice the measures of the off-site emergency plan in terms of:

ensuring public order and organizing a commandant service;

organizing the protection of farm animals, plants and livestock and plant products;

organizing radiation monitoring and decontamination;

practical training of the notification and information procedure, initial assessment and forecast of the development of an accident, development of management decisions on organizing priority protective measures to protect the population and territories.

<u>Notable achievement:</u>

The Republic of Belarus makes significant efforts to continuously improve the emergency preparedness and response system. At the national level, an annual check of the readiness of the participants in the emergency response system to events at NPPs to implement the Off-site Emergency Plan are ensured. The need for practical testing during drills (at least once every five years) of each of the measures of the Off-site Emergency Plan is enshrined in law. During the reporting period, the regulatory body developed and implemented quantitative criteria for assessing the success of emergency response drills and exercises; the practice of submitting additional (previously unknown to the participants) input to the initial scenario for conducting drills and training is applied; in some cases, drills and exercises are initiated according to the scenario specified by the regulator. The preparation of such scenarios and additional input is carried out by the regulator with the involvement of scientific and technical support organizations.

16.2 Informing the public and neighbouring states

Based on the Law of the Republic of Belarus [2.4], the republican body of state administration for emergency situations, other republican bodies of state administration, other state organizations subordinate to the Council of Ministers of the Republic of Belarus, local executive and administrative bodies and other organizations are required to promptly and reliably inform the population through the mass media and other channels about the state of protecting the population and territories from emergency situations, about ways and methods of protecting the population from them.

Concealment, untimely provision or provision by officials of deliberately false information in the field of protection of the population and territories from emergency situations is subject to liability in accordance with the legislation of the Republic of Belarus.

The procedure for informing the population about the threat of occurrence or occurrence of emergency situations, including the transfer of information about predicted and occurred emergencies, their consequences, and radiation safety in the relevant territories, is established by a Resolution of the Government of the Republic of Belarus [3.13].

The operation of the information management system of the SEPCS and providing information in the field of protection of the population and territories from natural and man-made emergencies is performed according to resolutions of the Ministry for Emergency Situations [4.8 and 4.9].

The Resolution of the Government of the Republic of Belarus No. 1118 of November 28, 2014 approved the Regulation on the Alert System for the Population, Governing Authorities and SEPCS forces and Civil Defence. The Regulation identifies the tasks, the procedure for use and maintenance of the alert system of the population, governing authorities and SEPCS forces and Civil Defence in constant readiness.

The Joint Resolution of the Ministry for Emergency Situations, the Ministry of Communications and Informatization and the Ministry of Information of the Republic of Belarus No. 42/27/9 of December 7, 2015 established a list of entities of the Alert System at the national level.

The Resolution of the Ministry for Emergency Situations No. 44 of December 18, 2015 approved the Instructions on implementation and operation of the local alert systems in areas of hazardous industrial facilities locations.

The operability of the automated system of centralized alerting of the public, enterprises and government agencies is tested regularly (according to the approved schedules) In the course of trainings the issues of public warning in case of radiation accidents are worked out.

The decision on public warning of the radiation accident and the recommended actions is taken by:

at all levels – the Prime Minister of the Republic of Belarus and his deputies, the Minister for Emergency Situations, in case of his absence - a person performing his functions;

at the territorial and lower levels – the chairperson of the regional Executive Committee (Minsk City Executive Committee), the head of the regional (Minsk city) Department of the Ministry for Emergency Situations, in case of their absence - persons performing their functions;

at the local and lower levels – the head of the local executive and administrative body, the head of the city (district) department for emergency situations, in case of their absence - persons performing their functions;

at the facility or local levels – the head of the organization operating the facility (hazardous production facility), in case of his absence – a person performing his functions; on-duty dispatcher.

Public warning is made through an automated centralized alert system as follows:

activation of the electrical alarm systems and loud speaking units;

transmitting voice information transmission using radio-/TV-broadcasting stations;

voice information transmission using wireless broadcasting units and local alerting systems of the potentially hazardous and heavily trafficked facilities;

voice information transmission using the fire rescue systems, vehicles of the Ministry of Internal Affairs and other special vehicles equipped with signal loudspeaking systems, in underpopulated areas, and horticultural societies beyond the electrical alarm announcement area;

transmission of text information using SMS messages from mobile operators;

publication of relevant information on the popular web-sites;

transmission of text, voice, video information via TV mass communication media.

The automated centralized alert system is regularly tested (according to the established schedules). During these tests, the population is informed about the event of a radiation accident.

The Republic of Belarus has ratified a number of international conventions, including Convention on Early Notification of a Nuclear Accident. The Government of the Republic of Belarus has signed 49 bilateral agreements on assistance and/or exchange of information/notifications, including with the neighbouring countries (the Republic of Latvia, the Republic of Lithuania, the Republic of Poland, the Russian Federation, Ukraine), which is noted as a good practice by the 2018 EPREV mission.

RCMER acts as a contact point for notification in the event of an accident and providing support in accordance with the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. The round-the-clock RCMER operation allows receiving any notifications and promptly respond or confirm information.

In case of nuclear or radiation accidents (incidents), RCMER informs the IAEA by fax, through the official web portal (USIE) and by phone.

In case of threat or occurrence of radiation accidents, foreign countries are immediately informed through direct information exchange between the executive officers of the RCMER duty shift and the corresponding crisis centers of the foreign countries. Official information is also sent to the foreign countries through the Ministry of Foreign Affairs of the Republic of Belarus according to the procedure established by the international agreements.

<u>Challenge on the results of the 8th and 9th Joint Meeting of the Contracting Parties:</u>

"Belarus should strengthen provisions for effective mechanisms of communication, transparency, and consulting to inform public and interested parties about incidents in facilities and activities, including accidents and abnormal occurrences, and other information, as appropriate."

The challenge is closed.

At present, the information about violations in the operation of the Belarusian NPP is sent without fail to the address of the republican state bodies of administration in the field of atomic energy use and the republican state bodies of administration implementing state regulation of activities to ensure safety in the use of atomic energy.

In accordance with the local procedures of the OO, an operational message about a violation in the operation is transmitted orally (via available communication channels) after the violation is detected, and also in writing within 1 hour after the violation is confirmed. In order to clarify the state of the power unit, a preliminary message about the violation in the operation is prepared and sent to Gosatomnadzor within 24 hours.

The Ministry of Energy (the state body superior to the OO) and its subordinate organizations, in cooperation with the Ministry of Information, relevant state bodies, and other interested parties, are working to cover in the media, social networks, and messengers the issues related to the development of the nuclear power infrastructure and nuclear safety in the country, the operation of the Belarusian NPP, including information on unscheduled shutdowns of power units from the grid with subsequent explanation of their causes.

In order to contribute to a positive attitude towards the design among the population, the information agenda includes the issues of strengthening nuclear and radiation safety, training, retraining and advanced training of personnel, handling radioactive waste and spent nuclear fuel, developing a safety culture, etc.

Preparation of comments for the media is carried out with the involvement of scientists, experts, parliamentarians, representatives of local authorities, and youth activists of the OO.

To clarify issues of NPP operation, as well as to popularize the nuclear industry, briefings, press conferences, round tables are regularly held, special projects for the release of documentaries are implemented jointly with the country's leading media, press tours to the Belarusian NPP are organized for Belarusian and foreign media, representatives of the blogosphere.

Particular attention is paid to informing citizens through direct telephone lines, meetings in work teams, organizing excursions to the Belarusian NPP information center.

For prompt and comprehensive coverage of the work of the Belarusian NPP, press releases are regularly sent to state media, information is posted in departmental telegram channels and social networks.

<u>Suggestion based on the results of the 8th and 9th Joint Meeting of the Contracting Parties:</u>

"To continue efforts in exchanging information, participation and cooperation with neighbouring countries."

The suggestion is closed.

Currently, the results of radiation and environmental monitoring in the Belarusian NPP supervised area are provided through the responsible regulatory body (the Ministry of Natural Resources) to all interested countries within the framework of the implementation of the Post-Design

Analysis Program of the Belarusian NPP for the fulfillment by the Republic of Belarus of its obligations under the Convention on Environmental Impact Assessment in a Transboundary Context.

Up-to-date information on the state of the radiation situation in the Belarusian NPP surveillance zone is posted on the global Internet on the official website of the state enterprise Belarusian NPP (https://www.belaes.by/ru/radiatsionnaya-obstanovka).

Summary of significant changes since the previous National Report

There have been no significant changes in the previously established emergency preparedness and response system, or in the system of informing and warning the population since the publication of the previous National Report. A significant number of practical tests of the On-site and Off-site Emergency Plans have been carried out through exercises and training at various levels. Detailed information is provided above in the text.

PART G: INSTALLATION SAFETY

ARTICLE 17. SITING

Each Contracting Party shall take the appropriate steps to ensure that appropriate procedures are established and implemented:

i) for evaluating all relevant site-related factors likely to affect the safety of a nuclear installation for its projected lifetime;

ii) for evaluating the likely safety impact of a proposed nuclear installation on individuals, society and the environment;

iii) for re-evaluating as necessary all relevant factors referred to in sub-paragraphs (i) and (ii) so as to ensure the continued safety acceptability of the nuclear installation;

iv) for consulting Contracting Parties in the vicinity of a proposed nuclear installation, insofar as they are likely to be affected by that installation and, upon request providing the necessary information to such Contracting Parties, in order to enable them to evaluate and make their own assessment of the likely safety impact on their own territory of the nuclear installation.

Summary statement for Article

Since the submission of the previous National Report, no sites for new nuclear installations falling under the definition of Article 2 of the Convention have been selected in the Republic of Belarus, and the regulatory framework governing the selection of sites for nuclear installations has not changed. In this regard, the information discussed during the 6th Meeting of the Contracting Parties to the Convention is provided in abbreviated form below in the text of Article 17 (subsections i, ii, iv).

During the operation of the Belarusian NPP, the state of environmental objects in the site of the NPP location is being monitored. Based on the results of the studies, no deviations from the design indicators of the NPP impact on the environment have been identified.

Thus, the Republic of Belarus has fulfilled its obligations stipulated by Article 17 at the stage of selecting a site for the construction of the Belarusian NPP and continues to fulfil them in terms of reassessing the factors affecting the safety of the nuclear installation.

17 (i) Evaluation of site-related factors

The decision to select the site for the Belarusian NPP was made taking into account the current technical codes of established practice [4.32 - 4.34], which defined:

the main criteria and requirements governing the siting of NPPs on the territory of the Republic of Belarus taking into account the influence of processes, phenomena and factors of natural and man-made origin and the impact of NPPs on the population and the environment;

the main requirements for the composition and scope of surveys and studies for selecting the site for the siting of NPPs on the territory of the Republic of Belarus;

the requirements for the development and content of the EIA report, justification of the environmental safety of NPPs.

At the stage of selecting the site for the construction of NPPs, observations were carried out of the state of the natural environment, agricultural and forest lands in order to obtain "background" data on radioactive and chemical contamination as a basis for subsequent assessments of the impact of the operating NPP on the population and the environment.

The above-mentioned main criteria and requirements governing the siting of NPPs in the territory of the Republic of Belarus, taking into account the influence of processes, phenomena and factors of natural and man-made origin and the impact of NPPs on the population and the environment, and their implementation during the determination of the site for the siting of the Belarusian NPP, allow us to declare compliance with principle 1 of the Vienna Declaration on

Nuclear Safety of 9 February 2015: “New nuclear power plants are to be designed, sited, and constructed, consistent with the objective of preventing accidents in the commissioning and operation and, should an accident occur, mitigating possible releases of radionuclides causing long-term off site contamination and avoiding early radioactive releases or radioactive releases large enough to require long-term protective measures and actions.”

The site for the Belarusian NPP was selected in accordance with the IAEA recommendations. The survey materials were reviewed with the participation of agency experts during special expert missions in 2008. At the stage of selecting the location of the future NPP, Belarus, in accordance with its international obligations and national legislation, carried out a comprehensive EIA and all necessary risk and safety assessments. Based on the EIA of the Belarusian NPP, Belarus held transboundary consultations with Austria, Latvia, Lithuania, Poland and Ukraine in 2009-2013, and discussions with the interested public.

In November 2013, after the completion of interstate consultations, the Head of State made a decision to build the Belarusian NPP at the Ostrovets site. This decision was made based on the results of the EIA, including the results of transboundary consultations, and approved design documentation, as well as the approvals and conclusions provided for by national legislation. The EIA materials and conclusions showed the absence of significant adverse transboundary impacts of the Belarusian NPP design. None of the countries participating in the transboundary consultations presented any evidence of a possible significant adverse impact on the environment as a result of the design.

In 2017, the IAEA SEED mission confirmed that Belarus had taken the necessary steps to ensure the protection of the Belarusian NPP in the event of a worst-case external event, that the external threats typical for the site (earthquakes, floods and extreme weather conditions, events caused by human factors) were properly taken into account in the NPP design, and measures were taken in light of the lessons learned from the Fukushima Daiichi accident.

At the stage of selecting the site for the Belarusian NPP, Gosatomnadzor carried out continuous supervision of the compliance of all organizations of the Republic of Belarus involved in the site selection. Their compliance with the requirements of technical regulatory legal acts was reviewed. Based on inspection results, notices were issued to organizations with deadlines to eliminate violations. All violations were eliminated.

17 (ii) Impact of the installation on individuals, society and environment

On the basis of the results of studies of the NPP environmental impact, the following was established.

The NPP produces no significant impact on the geological environment, and the engineering solutions including foundation of the nuclear building and other 24 important buildings and facilities ensure their stability under any influences stipulated by the regulatory requirements (seismic activity, shock wave, etc.).

The costs associated with withdrawal of the land parcel for the construction of the nuclear power plant are fully accounted for in the design.

The NPP is supplied with process water through the recycling system using cooling towers and spray ponds. No changes in the microclimate parameters and atmospheric processes in the area of the nuclear power plant location related to emissions of heat and moisture from these facilities are observed.

The technical water supply system is replenished from the Viliya River. A shortage of water resources in the Viliya River is not expected.

Under normal operating conditions:

The Belarusian NPP does not have a radiation impact on the population and the environment. The values of gas-aerosol emissions and liquid discharges of radioactive substances do not exceed the established standards for permissible emissions and discharges. The values of the ambient dose equivalent rate of gamma radiation and the levels of radionuclide content in environmental objects in the supervised area of the Belarusian NPP correspond to the levels of “zero” radiation background;

chemical substances emitted by auxiliary structures do not have a harmful effect on the population, since their maximum ground concentration, taking into account background pollution, even within the boundaries of the sanitary protection zone is below the maximum permissible concentration;

technological emissions from nuclear power plants do not produce negative impact on the soil, surface and ground water, flora and fauna.

The operation of nuclear power plants does not affect the condition of groundwater in the 30-km zone; the quality of water (chemical, bacteriological indicators) of artesian water intakes does not depend on the operation of nuclear power plants.

17 (iii) Re-evaluation of site-related factors

During the operation of the Belarusian NPP, the surveillance over the state of environmental objects in the area of the NPP location is continued.

In order to control the state of the environment, the OO implements the Integrated Ecological Monitoring Program of the region and the site of the Belarusian NPP to investigate the dynamics of changes in the parameters and characteristics of processes and phenomena of natural processes in the specified area.

The following types of surveillance over the environmental status are performed: RM; seismological monitoring; geodetic monitoring of the present-day crustal motion; monitoring of meteorological processes, phenomena and factors; microclimate monitoring; aerological monitoring; groundwater monitoring; hydrological monitoring (monitoring of the surface water regime); geotechnical control (monitoring of the settlement of buildings and structures).

The results of the investigations did not reveal any deviations from the design indicators of the NPP impact on the environment.

17 (iv) Consultation with other Contracting Parties likely to be affected by the installation

In 2009-2013, Belarus conducted transboundary consultations with Austria, Latvia, Lithuania, Poland and Ukraine as part of the procedure for assessing the environmental impact of the Belarusian NPP.

Neither country which had been involved in transboundary consultations provided any evidence of possible significant harmful impact on the environment as a result of design implementation.

Belarus invited these countries to take part in the subsequent post-design analysis and consultations concerning its program.

The official websites of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (https://minpriroda.gov.by/ru, in the section "Environmental Impact Assessment (EIA)) and the State Enterprise "Belarusian NPP" (https://belaes.by/ru, in the section "Ecology") contain information on the Belarusian NPP design, in particular: the EIA report, the final decision on the planned activity, the conclusion of the state environmental assessment for the design, etc. The regulatory authority, other government bodies and organizations of the Republic of Belarus, within their competence, constantly inform the interested public, the professional community about the activities to ensure nuclear and radiation safety in the context of the implementation of the first nuclear power program – both during events within the framework of bilateral and multilateral cooperation, and within the framework of interaction through the IAEA instruments (including the Regulatory Cooperation Forum (RCF). The Republic of Belarus is ready to resume full-scale cooperation with such organizations as the Western European Nuclear Regulators Association (WENRA), the Forum of the State Nuclear Safety Authorities of the Countries Operating WWER Type Reactors (WWER Forum) if there is an invitation to participate in their relevant events.

ARTICLE 18. DESIGN AND CONSTRUCTION

Each Contracting Party shall take the appropriate steps to ensure that:

i) the design and construction of a nuclear installation provides for several reliable levels and methods of protection (defence in depth) against the release of radioactive materials with a view to preventing the occurrence of accidents and to mitigating their radiological consequences should they occur;

ii) the technologies incorporated in the design and construction of a nuclear installation are proven by experience or qualified by testing or analysis;

iii) the design of a nuclear installation allows for reliable, stable and easily manageable operation, with specific consideration of human factors and the man-machine interface.

Summary statement for Article

The technical design of the Belarusian NPP provides for five physical barriers that prevent unacceptable release of radioactive substances and ionizing radiation, as well as a system of technical and organizational measures of the defence in depth.

The AES-2006 design is based on the use of mastered technology and equipment, the availability of prototypes, and experience in the construction and operation of power units. The main technological equipment used in the design has many years of positive experience in operation at Russian NPPs and NPPs in other countries built according to Russian designs. The reference power units of the Belarusian NPP are the commissioned power units of the Leningrad NPP-2.

The choice of the AES-2006 design for the Belarusian NPP was made on the basis of a preliminary comprehensive analysis during the preparatory work to ensure maximum reliability, safety, stable and controlled operation, and taking into account the modernity of the technologies used and special consideration of the human factor. The design provides for technical measures to prevent and limit the consequences of erroneous actions by personnel that violate safety functions. The design and construction stages of the Belarusian NPP complied with principle 1 of the Vienna Declaration on Nuclear Safety of 9 February 2015.

18.0 Introduction

Regulatory documents define the requirements for the design of NPPs, including requirements for individual systems and components, as well as the functions they perform. According to the requirements [4.14, 4.15]:

NPP safety is achieved through high-quality design, engineering and manufacture of equipment, siting, construction and operation of NPPs through compliance with the requirements of regulatory documents, the formation and maintenance of a safety culture, taking into account operating experience and the current level of development of science and technology;

NPP safety shall be ensured through the consistent implementation of defence in depth, based on the use of a system of physical barriers to the propagation of ionizing radiation and radioactive substances into the environment, and a system of technical and organizational measures to protect the barriers and maintain their effectiveness, as well as to protect personnel, the population and the environment;

NPPs should have safety systems designed to perform the following main safety functions: emergency shutdown of the reactor and maintaining it in a subcritical state; emergency heat removal from the reactor; retention of radioactive substances within established boundaries. Mutual influence of safety systems that prevents their proper performance of safety functions shall be excluded;

the NPP design should provide for special technical means to ensure control of the BDBA;

systems and elements important to safety should be capable of performing their functions to the extent established by the NPP design, taking into account external natural impacts;

when designing an NPP, measures should be considered and justified to protect safety systems and elements, as well as systems and elements of special technical means for accident management from common cause failures by implementing the principles of diversity, redundancy (redundancy) and independence;

when designing NPP and reactor systems (elements), the preference should be given to systems (elements) the design of which is based on the passive principle of operation and the properties of internal self-protection (self-regulation, thermal inertia, natural circulation and other natural processes), as well as on the implementation of the principle of safe failure;

the NPP design should provide for means by which personnel errors are prevented or their consequences are mitigated, including during maintenance and repair;

the control safety systems should be designed in such a way as to prevent the possibility of disabling the safety systems by the operating personnel within 10-30 minutes after their automatic start-up, but not to interfere with the correct actions of the operator in emergency conditions, as provided for by the process regulations, the instructions for eliminating accidents, the manual for managing the BDBA;

the NPP design should provide for technical means for monitoring the state of the reactor plant and the NPP in emergency conditions, including severe accidents, as well as means for post-accident monitoring;

regulatory documents define requirements for the design of nuclear power plants, including requirements for individual systems and components, as well as the functions they perform.

The design and construction of nuclear installations are licensed activities in accordance with the Regulation on licensing activities in the field of atomic energy and IRS [2.7]. The issuance of a license to carry out these types of work is preceded by a safety review of the full set of documents justifying the safety of the work, the list of which is established in the norms and rules for ensuring nuclear and radiation safety [4.1].

The safety review is carried out with respect to the nuclear installation and documents justifying nuclear and radiation safety, in order to assess their compliance with regulatory documents, the current level of development of science, technology and production. The results of the safety review and the safety assessment of the submitted documents conducted by Gosatomnadzor were the basis for issuing the relevant license and carrying out work on the design and construction of the Belarusian NPP. At the stage of preparatory work for the construction of a nuclear power plant in the Republic of Belarus, one of the most important tasks was to select a reliable, safe and cost-effective nuclear power plant design and, accordingly, a company that would implement this design by supplying equipment for the nuclear power plant. Taking into account the comprehensive analysis, the choice was made in favour of the Russian design “AES-2006”, which is currently being implemented. The design of the Belarusian NPP was developed in accordance with the requirements of regulatory legal acts, including technical regulatory legal acts, of the Republic of Belarus, the Russian Federation and the IAEA recommendations. The main characteristics of the Belarusian NPP are given in Article 6 of this National Report.

During the construction of a nuclear power plant according to the “AES-2006” design, the following is ensured:

construction of a generation 3+ nuclear power plant, the special feature of which is a new reactor plant with additional safety systems: PHRS; passive leak filtration system into the intershell space;

double protective containment; fuel melt trap in case of beyond design basis accident;

maximum implementation of the principle of defence in depth – creation of a system of barriers to the spread of ionizing radiation and radioactive substances into the environment and a system of technical and organizational measures to protect the barriers, as well as maintaining their effectiveness in the direct protection of the population;

compliance of the NPP with the radiation safety criteria contained in both national legislation and international practice of NPP design.

To perform safety functions, the design of NPPs provides for the use of safety systems built on the principles of redundancy, spatial and functional independence, and a single failure.

In addition, an assessment of the safety and compliance of the design with its actual implementation was carried out for power unit No. 1 of the Belarusian NPP during the licensing of its construction (including phased commissioning), as well as within the framework of the review of documents prior to issuing a license for the operation of power unit No. 1. The safety assessment in relation to the construction (commissioning) and preparation for commercial operation of power unit No. 2 of the Belarusian NPP is being carried out and is one of the main tasks at the time of publication of the Report. The process of reviewing and conducting safety assessments is continuous; the safety assessment of changes to the basic configuration is carried out as part of the safety assessment of modifications implemented during operation at the NPP, as well as within the framework of the periodic safety assessment required by the requirements (once every 10 years).

Article 18 (1) Implementation of the "defence-in-depth" concept

The defence in depth concept implies creating a system of physical barriers to the spread of radioactive substances and irradiation, and a system of technical and organizational measures to maintain workability of physical barriers and to mitigate the consequences of their damage.

The defence in depth is ensured primarily through combination of consistent and independent defence levels. Only after the failure of all defence levels the population or the environment can be exposed to harmful effects. In case of the failure of one defence level or penetration through one barrier, there is the next level or barrier.

The technical design project of the Belarusian NPP provides five physical barriers preventing unacceptable release of radioactive substances and ionizing emission. This includes a fuel matrix, fuel-element cladding, primary coolant equipment, leak tight confinement of the reactor system and a biological shield.

The technical and organizational measures system includes the following defence in depth levels:

level 1 - conditions for the NPP siting and preventing normal operation violations;

level 2 - preventing design accidents by normal operation systems;

level 3 - preventing BDBA by safety systems;

level 4 - BDBA management;

level 5 - emergency planning.

The NPP safety concept is based on the active safety systems having both normal power supply and emergency power supply from diesel generators.

To prevent severe accidents or reduce their consequences, the passive systems are available capable of operating without intervention of the NPP personnel and power supply.

To achieve the safety level required by the regulatory documents of the Republic of Belarus, the Russian Federation and the IAEA recommendations, the design project defines a set of safety systems and additional facilities for BDBA management.

The main tasks of BDBA management are: preventing the core damages; preventing the reactor vessel melting; preventing the containment failure; decrease of nuclear emission into the environment.

Accounting for personnel errors is a necessary element of both deterministic and probabilistic analysis of the safety of systems important for the safety of nuclear power plant.

The deterministic safety analysis demonstrated effectiveness of operation of the safety systems and the systems important for safety of the nuclear power unit within the frames of the design basics for provision of safe NPP operation in design conditions. The project of the NPP power unit enables fulfilment of the requirements for the radiation dose limits and emissions established by regulatory documents for the NPP design conditions.

The results of the BDBA modes analysis provided in SAR of the State Enterprise "Belarusian NPP" showed the possibility of managing the BDBA, which makes it possible to effectively limit their consequences. Based on the concept of safety assurance of the Belarusian NPP, the BDBA management (including severe accidents) is related to the 4th level of NPP protection which implies:

preventing BDBA development and reducing their consequences;

protecting tight enclosure (containment) from destruction during BDBA and maintenance of its operability;

the return of the nuclear power plant to a controlled state, at which the fission chain reaction stops;

ensuring constant cooling of the nuclear fuel and the retention of radioactive substances within the established limits.

To achieve the goals of the 4th level of defence in depth, the following technical means are used among others:

emergency boron injection system, PHRS from SG, PHRS from containment, pulse-safety device of pressure compensator;

emergency ventilation system to maintain the medium vacuum and cleaning in the space between shells, a system for chemical binding of volatile forms of iodine, a core melt retention system;

the system of emergency use of water from inspection cavities.

To manage accidents at the Belarusian NPP, the instructions for accident mitigation, guidelines for BDBA management including severe accidents, have been developed.

The results of the implemented levels 1 and 2 of PSA confirmed the probabilistic criteria for NPP safety established by regulatory documents: the probability of severe accidents for 1 year is $8.57*10^{-7}$(1/year), the average value of the total probability of a large accidental emission for 1 year is $8.61*10^{-8}$ (1/year).

Based on the results of commissioning of power unit 2 of the Belarusian NPP, and taking into account all the modifications carried out at the NPP, the above indicators were recalculated. The adjusted values are as follows: the probability of severe accidents for 1 year is $8{,}36*10^{-7}$ (1/year), the average value of the total probability of a large accidental emission for 1 year is $9{,}94*10^{-8}$ (1/year). However, verification of the new values within the framework of the PSA procedure carried out by the regulatory body has not been completed by the time of filing this report.

The application of the defence in depth principle at the power units of the Belarusian NPP is expressed in the SAR of power units, the results of the safety review of which indicate the compliance of the applied system of organizational and technical measures with regulatory documents requirements.

Following the submitted report on the assessment of the current state of safety of the Belarusian NPP for 2021 and the results of the control and supervisory measures implemented by Gosatomnadzor, the state of physical barriers meets the requirements of regulatory documents, design and operational documentation. Violations of the limits and conditions of safe operation have not been recorded.

Measures aimed at improving safety developed based on stress tests outcomes are given in Article 6.

Article 18 (ii) Incorporation of proven technologies

The AES-2006 concept is based on the use of mastered technology and equipment, the availability of prototypes, and experience in the construction and operation of power units. The main process equipment used in the project has many years of positive experience in operation at Russian NPPs and NPPs in other countries built according to Russian designs.

The advantage of the AES-2006 design is the unique combination of active and passive safety systems (double reactor containment, PHRS from the reactor core in emergency situations, core melt localization device), ensuring the highest level of safety and meeting the requirements of not only today, but also future decades.

The use of these systems allows protecting the NPP from natural and man-made impacts, as well as erroneous actions by personnel in emergency situations.

The operating power units of the Leningrad NPP-2 are the reference power units of the Belarusian NPP.

18 (iii) Design for reliable, stable and manageable operation

AES-2006 design for the Belarusian NPP was selected based on the preliminary comprehensive analysis during preparation stage to ensure maximum reliability, safety, sustainable and manageable operation, taking into account the relevance of technologies used and with special attention to human factor.

The design provides technical measures to prevent and limit the consequences of false staff operation which violates safety functions. Taking into account the human factor in the design of a nuclear installation, its operation and maintenance, the licensee's measures (administrative and managerial, organizational, etc.) to take into account the influence of the human factor are given in Article 12.

Regulatory actions in relation to works related to the Belarusian NPP construction, the principles and legal basis for their implementation are described in the Articles 7 and 12 of the present National Report.

Summary of significant changes since the previous National Report

Since the publication of the previous National Report, both units of the Belarusian NPP have successfully completed the construction stage and have moved on to the operation stage. During the construction stage, as well as during the previous stages of the NPP life cycle, principle 1 of the Vienna Declaration on Nuclear Safety of 9 February 2015 was fully observed: "*New nuclear power plants are to be designed, sited, and constructed, consistent with the objective of preventing accidents in the commissioning and operation and, should an accident occur, mitigating possible releases of radionuclides causing long-term off site contamination and avoiding early radioactive releases or radioactive releases large enough to require long-term protective measures and actions*."

ARTICLE 19. OPERATION

Each Contracting Party shall take the appropriate steps to ensure that:

i) the initial authorization to operate a nuclear installation is based upon an appropriate safety analysis and a commissioning program demonstrating that the installation, as constructed, is consistent with design and safety requirements;

ii) operational limits and conditions derived from the safety analysis, tests and operational experience are defined and revised as necessary for identifying safe boundaries for operation;

iii) operation, maintenance, inspection and testing of a nuclear installation are conducted in accordance with approved procedures;

iv) procedures are established for responding to anticipated operational occurrences and to accidents;

v) necessary engineering and technical support in all safety-related fields is available throughout the lifetime of a nuclear installation;

vi) incidents significant to safety are reported in a timely manner by the holder of the relevant license to the regulatory body;

vii) programs to collect and analyse operating experience are established, the results obtained and the conclusions drawn are acted upon and that existing mechanisms are used to share important experience with international bodies and with other operating organizations and regulatory bodies;

viii) the generation of radioactive waste resulting from the operation of a nuclear installation is kept to the minimum practicable for the process concerned, both in activity and in volume, and any necessary treatment and storage of spent fuel and waste directly related to the operation and on the same site as that of the nuclear installation take into consideration conditioning and disposal.

Summary statement for Article

The Republic of Belarus fully complies with the provisions of Article 19. The entire required set of safety analysis measures both at the stages of issuing the initial permit (license) for operation and during operation has been completed and is being carried out on an ongoing basis.

Regulations, instructions, programs and other documents, according to which the OO carries out activities for the operation of a nuclear installation, were developed in a timely manner and underwent a safety review. A procedure has been established for amending the said documents during the operation stage, including taking into account the conduct of a safety review independent from the OO.

Engineering and technical support for both the OO and the regulator is provided with both financial resources and institutional ones – at the level of the relevant scientific institutions. There are legal requirements to inform the regulator of any safety-significant events on the site. The supervision program of the regulatory body provides for control over such information, as well as over other aspects of the OO IMS activities.

Operating experience at the OO level is taken into account – the relevant aspects of the activity are also included in the supervision program of the regulator. In order to formulate and implement a technologically optimal, economically feasible, ecologically and socially safe state policy in the field of SNF management, the Strategy of SNF Management of the Belarusian NPP has been developed and approved [3.18].

The relevant supporting information is presented in the text of this Report (in other articles), as well as further in the text.

<u>Notable achievement:</u>

The Republic of Belarus has systematically organized measures aimed at continuously improving the safety of the NPP. At the Government level, a Plan of Key Measures to Improve the Efficiency and Reliability of Operation of the Belarusian Nuclear Power Plant for 2025–2035 was adopted. At the OO level, relevant detailed plans were adopted containing measures for the continuous analysis and coordinated implementation of the adopted regulatory requirements (both on nuclear and radiation safety and on other safety aspects) into the OO activities, taking into account the positive experience of operating NPP units in other countries, sustainable provision of NPPs with the necessary resources, including scientific, engineering and technical support, maintaining and building up personnel competencies, introducing enhancements aimed at improving the safety of process equipment, etc. The implementation of these detailed plans is included in the list of licensing requirements and conditions for the OO and is monitored by the regulator.

To provide financial support for measures to continuously improve safety, a special fund was created by the Decree of the President of the Republic of Belarus, which is formed through deductions from the profits of the OO. In addition, for the further systematic development of the general infrastructure ensuring nuclear and radiation safety, a subprogram “Radiation Safety” has been formed as part of the State Program “Population Safety Infrastructure for 2026-2030”. At the time of preparation of this Report, the procedure for its formalization by a Government resolution is underway.

19 (i) Initial authorization

The NPP power units were commissioned in accordance with the Programs for commissioning of NPP units. The requirements for the availability of such programs are established by the law [2.2]. The Programs for commissioning NPP units were developed no later than 6 months before the start of commissioning of the power units based on the NPP design and took into account the experience of commissioning of similar units. The scope of the programs extended to all aspects related to the commissioning of the power unit. The programs, among other things, contained:

preparatory activities and criteria for transition from one stage (substage) to another during commissioning;

measures for safe and high-quality performance of work;

measures for meeting the requirements of regulatory documents;

the sequence of testing at each stage of commissioning, checking the quality of work performed at previous stages;

measures for conducting a comparative analysis of the compliance of the actual state of components and systems with design and engineering solutions, as well as confirming that the systems and elements have been manufactured and are functioning in accordance with the design,

measures for confirming the limits and conditions of safe operation, as well as the design characteristics of the NPP systems and equipment.

The Programs for commissioning NPP units were assessed by Gosatomnadzor for compliance with the established requirements within the framework of the relevant safety review – before issuing the relevant license.

The stages of commissioning of the units were carried out taking into account the following approaches to ensuring safety, enshrined at the level of norms and rules for ensuring nuclear and radiation safety [4.14]:

commissioning of the NPP unit is carried out taking into account the requirements of regulatory documents;

the requirements for the sequence and scope of work performed at the stages of pre-commissioning adjustment work, physical start-up, power start-up, trial operation, including the procedure for checking the NPP systems and components important to safety for compliance with design indicators, including acceptance criteria are established and justified in the NPP design and submitted to the NPP Safety Assessment Report (preliminary version);

pre-commissioning adjustment works, physical and power start-ups, trial operation should confirm that the NPP as a whole, as well as the systems and elements important to safety, are implemented and operate in accordance with the NPP design, the identified deficiencies are eliminated;

the first delivery of nuclear fuel to the NPP site is permitted after the NPP readiness for delivery of nuclear fuel has been checked, provided that there are plans for the protection of personnel and the population in the event of an accident at the NPP and the readiness to implement them and obtain a license, by the regulator;

the first loading of the standard core, tests in the subcritical state of the reactor facility, performing physical experiments at the minimum controlled level, power start-up and trial operation are permitted after the readiness for the corresponding stages of commissioning of the NPP has been checked and special permits (licenses) have been obtained;

operation of the NPP unit is permitted after obtaining an operating license.

Verification of compliance with these approaches was the key task of the regulator at the stage of commissioning of NPP units. The decision to issue a license for the operation of each of the nuclear installation units, as well as permits from Gosatomnadzor to move from one stage of commissioning to another, were based on the results of the safety review, as well as the results of Gosatomnadzor’s targeted inspections of the OO’s readiness to begin the relevant stage (sub-stage or phase of a sub-stage) of commissioning.

For reference:

The process of commissioning of the start-up complex of the Belarusian NPP unit consisted of two consecutive periods:

1) the preparatory period of commissioning works;

2) the period of putting the power unit into operation.

The second period was carried out in accordance with the stage programs that passed the safety review (as part of the documents justifying the provision of nuclear and radiation safety [48]) and included the following main stages: Stage A – “Pre-commissioning start-up operations”, Stage B – “Physical start-up”, Stage C – “Power start-up”, Stage G – “Trial operation”.

Gosatomnadzor carried out the above-mentioned targeted inspections of the NPP site readiness for the start of each of the stages, sub-stages (and phases of such sub-stages) of commissioning of the nuclear installation units for compliance with regulatory documents, as well as the requirements contained in the design and operational documentation, including power unit commissioning programs and stage programs. At the same time, during Gosatomnadzor inspections (both inspections for the NPP site readiness for the next stage of commissioning of the power unit, and during such a stage), the compliance of the obtained test results with the established requirements, as well as the criteria contained in the design documentation and documents justifying the provision of nuclear and radiation safety, was also subject to analysis.

The safety review for the purpose of obtaining a license to operate a nuclear installation is carried out in stages with the provision of individual expert opinions for each of the stages of commissioning the nuclear installation and a final generalized expert opinion. As a part of the review of expert opinions, comprehensive interaction was organized and conducted between Gosatomnadzor, expert organizations, OO, general contractor and other organizations performing works and providing services within the framework of commissioning of the nuclear facility. Information on the legislative and regulatory framework ensuring effective legal regulation of the activities related to the operation of nuclear facilities is provided in Article 7. Information on the regulator's safety assessment system (including safety reviews) is provided in Article 14.

19 (ii) Operating limits and conditions

According to national requirements, safe operating limits are understood to be the values of process parameters, deviations from which may lead to an accident. A distinction is made between safe operating limits for radiation parameters and safe operating limits for other process parameters.

Safe operating conditions are understood to be the minimum conditions for the quantity, characteristics, state of operability and conditions of technical maintenance of systems (elements) important to safety, under which compliance with safe operating limits and (or) safety criteria is ensured.

GSP NPP [4.14] and Nuclear Safety Rules for NPPs [4.15] establish the basic safety requirements and criteria, on the basis of which the general requirements for safe operating limits and conditions are formed.

According to the requirements of GSP NPP [4.14]:

the NPP design should justify the limits and conditions of safe operation, and also provide for technical means and organizational measures aimed at preventing violation of the limits and conditions of safe operation;

The Safety Assessment Report of the NPP should reflect the operational limits and conditions, limits and conditions for safe operation for all operational states of the NPP, including reactor operation at power, shutdown states, and NF reloading.

The OO with the participation of the NPP and RS project developers in accordance with the project and taking into account the specified regulatory standards, before the start of operation, the development of the Technological Regulations for Safe Operation for each of the NPP power units was ensured. The TRSO is the main document defining the safe operation of the NPP unit and contains the rules and basic operating techniques, the general procedure for performing safety-related operations, as well as the limits and conditions for safe operation of the unit.

Operation of the NPP unit in violation of the TRSO requirements is prohibited by law.

The TRSO and amendments made to it should be agreed upon with the organizations that participated in its development.

The Technological Regulations for Safe Operation of a nuclear power plant unit in accordance with the requirements of [4.1] are one of the documents justifying the provision of nuclear and radiation safety, are subject to safety review, and their compliance is a special licensing requirement and a condition of a special permit (license).

Changes made to the TRSO belong to the first category of modifications, the implementation of which requires the submission for consideration by Gosatomnadzor of a technical solution, a modification to SAR, a training program for NPP personnel, and a list of operating documentation to which changes are made in connection with the planned modification. The specified package of documents undergoes a safety assessment, including taking into account the recommendations defined in the Safety guidelines "Recommendations for safety assessment of modifications at nuclear power plants [4.36].

The results of the safety assessment of the submitted package of documents on the modification of the TRSO are the basis for Gosatomnadzor to make a decision on making changes to the OA license, allowing the operation of the NPP power unit, taking into account the changes made to the TRSO.

The implementation of the TRSO of NPP power units is monitored by the regulator within the framework of the relevant supervision program.

Operation of the unit at power involves periodic inspection of the operability of the channels of systems important for safety according to regulations for inspections and tests of systems important for safety. Monitoring the implementation of the specified regulations, as well as the inspections themselves, is also included in the inspection program of Gosatomnadzor.

In accordance with the requirements of the GSP NPP [4.14], the NPP power unit should be stopped and transferred to the safe state provided for by the NPP design if the limits and (or) conditions for safe operation established for it during the operation of the reactor facility are not met.

Violations of the limits and conditions of safe operation of the Belarusian NPP should be investigated. The OO should develop and implement measures to prevent the recurrence of violations of the limits and conditions of safe operation for the same reasons.

Accounting and investigation of violations in the operation of the NPP, informing the regulatory body about them are carried out in accordance with the requirements of the norms and rules for ensuring nuclear and radiation safety [4.18].

Regarding the possible impact of global climate change on the safe operation of nuclear installations, the following is noted.

There are no significant climatic deviations from the established average annual indicators that could affect the safety of the NPP on the territory of the Republic of Belarus. In particular, the

Environmental Protection Division of the State Enterprise “Belarusian NPP” constantly monitors the regime of groundwater and surface waters, meteorological and aerological parameters of the atmosphere. Monitoring such parameters and characteristics of processes (phenomena) of natural origin in the area and directly at the NPP site confirms that natural risks are properly taken into account in the design. In addition, such observations allow for the timely identification of negative trends in changes in climatic parameters and the development of recommendations on measures to minimize possible negative impacts of natural origin on the operation of the Belarusian NPP if such a need arises in the future.

19 (iii) Procedures for operation, maintenance, inspection and testing

Regulatory documents, including the GSP NPP [4.14], define the requirements for the development and availability of documents regulating the issues of operation, maintenance and testing in terms of:

development and availability of the TRSO of the NPP power unit (more detailed information is provided in the item 19 (ii);

development by the OO (prior to the start of pre-commissioning adjustment works) of operating instructions for systems and equipment containing specific instructions to personnel on the methods of performing work during normal operation, operation with deviations and pre-emergency situations;

development and implementation by the OO of regulations for technical maintenance, repair, testing and inspections (the development of these regulations for the Belarusian NPP was carried out with the participation of the reactor plant and NPP project developers in accordance with the NPP project and the SAR);

performance of nuclear-hazardous work in accordance with the programs for performing nuclear-hazardous work developed and approved in the established manner. Performance of nuclear-hazardous work not provided for by the TRSO of the NPP power unit and operating instructions may be carried out by the OO only according to a specially developed program for carrying out work, containing measures to ensure the safety of these tests based on the safety analysis performed and agreed with the developers of the reactor plant and NPP design. Tests are permitted in accordance with the requirements of the license and, accordingly, after conducting a safety review;

timely introduction of changes to the operating documentation in connection with the planned modifications;

development for safety-critical systems of regulations, instructions for conducting inspections, schedules for maintenance, scheduled outages and overhauls of systems and components, schedules for conducting tests and inspections of the functioning of safety systems in accordance with the requirements of the Nuclear Safety Rules for NPPs [4.15].

At the request of the regulatory body, the OO should conduct unscheduled inspections of the operability of safety systems, special technical means for controlling the BDBA, as well as unscheduled monitoring of the condition of the base metal and welded joints of the NPP systems and components important to safety.

The OO together with the general contractor, based on the results of commissioning work prior to the commissioning of power units No. 1 and No. 2 of the Belarusian NPP into commercial operation, adjusted the operating instructions to bring them into line with the actual state of the power units after completion of commissioning work and the requirements of the documents justifying the provision of nuclear and radiation safety.

In accordance with the requirements of regulatory documents, the OO has developed a complete list of documents regulating the operation, maintenance, testing and inspection. Thus, instructions, programs and schedules for maintenance, repair, testing and inspection of safety-critical systems, standard programs (regulations) for pre-operational and operational monitoring of the condition of the base metal and welded joints of equipment and pipelines of safety-critical systems in accordance with the requirements are included in the documents for obtaining a license to operate a nuclear installation, [4.1] and have undergone a safety review as part of obtaining a license to operate power unit No. 1 of the Belarusian NPP, as well as a part of a step-by-step safety review for power unit No. 2 of the Belarusian NPP.

Work on the maintenance and repair of equipment at the Belarusian NPP is carried out taking into account the following approach:

maintenance and routine repairs are performed by the repair personnel of the Belarusian NPP, in connection with which the Belarusian NPP has the necessary personnel and a set of workshops; medium and major repairs of equipment of safety-critical systems are performed on a service basis by supplier plants or specialized repair organizations;

acceptance of equipment of safety-critical systems from repair is performed by the repair personnel of the OO;

the involved repair personnel should be trained and certified, specialize in certain systems, be assigned to them and bear responsibility for the quality of repair of equipment of these systems.

Routine scheduled and unscheduled inspections (testing) (except for hydraulic tests) of safety-critical systems during operation of the power unit are performed in accordance with the "Regulations for inspections and testing of safety-critical systems". The frequency of inspections (testing) of equipment of safety-critical systems of the power unit is determined by the "Schedule of routine inspections of safety-critical systems", compiled annually. The conditions, procedure, and criteria for the success of inspections (testing) of safety-critical systems (elements) are determined by the "Regulations for inspections and testing of safety-critical systems". In cases where the criteria for the success of inspections (tests) are not defined by the "Regulations for inspections and tests of safety-important systems. Unit No. 1" and "Regulations for inspections and tests of safety-important systems. Unit No. 2", the criteria are determined by programs developed for the relevant inspections (tests) in accordance with the current requirements of regulatory documents and based on the requirements of operational documentation.

Production control is carried out in accordance with the developed and approved regulations on the system of industrial control of the safety status of the State Enterprise "Belarusian NPP".

At the NPP, a schedule of rounds of workplaces by administrative and technical personnel is drawn up and approved. Rounds and inspections of workplaces are carried out by the heads of the NPP and structural divisions, including at night. The results of the rounds are analysed by the NPP management.

The results of tests of safety-important systems are submitted to Gosatomnadzor on a monthly basis.

Control over compliance with regulatory requirements in the context of operation, including maintenance, repair and testing, is carried out by Gosatomnadzor within the framework of the relevant supervision program.

The OO ensures continuous control of all activities important for the safety of the Belarusian NPP.

In accordance with the requirements of the Regulation of activities in the field of use of atomic energy and IRS [2.7], the OO provides an annual report on the assessment of the current state of safety, which includes the results of the assessment of the OO's activities in terms of performing maintenance, testing and the results of departmental control. More detailed information is provided in Article 14.

19 (iv) Procedures for responding to operational occurrences and accidents

Requirements for procedures for responding to incidents and accidents expected during commissioning and operation are regulated by legislation in the field of nuclear and radiation safety. The OO bears primary responsibility for their complete implementation.

For the Belarusian NPP, emergency plans have been developed, approved and tested during emergency drills: an On-site Emergency Plan approved by the Director General of the Belarusian NPP in June 2023, and an Off-site Emergency Plan approved by Resolution of the Government of the Republic of Belarus dated March 22, 2018 No. 211. Information on emergency plans is provided in Article 16.

In accordance with the established regulatory requirements, the OO has also developed the following documents defining measures to prevent pre-emergency situations and accidents, and measures to manage them:

Technological regulations for safe operation of power units No. 1, No. 2;

Instructions for the elimination of violations of the normal operation of power units No. 1, No. 2;

Instructions for managing design accidents of the Belarusian NPP in the event-oriented format of power units No. 1, No. 2;

Instructions for managing design accidents of the Belarusian NPP in the symptom-oriented format of power units No. 1, No. 2;

Guidance for beyond design basis accident management. Part 1 event-oriented. Power unit No. 1, No. 2;

Guidance for beyond design basis accident management. Part 2 symptom-oriented. Power unit No. 1, No. 2;

Severe accident management guidance (SAMG). Belarusian NPP. Power unit No. 1, No. 2. Part 1 General provisions. Part 2 Accident management rules. Part 3 SAMG instructions;

Emergency response regulations for possible flooding, destruction, spills of chemically hazardous substances, premises or equipment icing affecting the trouble-free operation of Belarusian NPP facilities;

Guidance on restoring the RS safe state (engineering support in case of accidents and emergencies at nuclear power plants);

Regulations on the Accident Management Group;

Instructions for the actions of operating personnel when the alarm of the automated workstation of the main control unit/radiation control unit is triggered. Power unit No. 1, Power unit No. 2;

Instructions for the operational personnel actions at MCR / BCP APC alarm tripping. Power unit No.1. Power unit No.2;

In order to plan, ensure readiness and implement measures to protect the NPP personnel and the territory from natural and man-made emergencies, in accordance with the laws of the Republic of Belarus and the resolutions of the Government of the Republic of Belarus, the system of prevention and mitigation of emergency situations of the Belarusian NPP has been created and is operating.

The main information and control element in the emergency prevention and response system of the Belarusian NPP is the Crisis Center. One of the main tasks of the Crisis Center is to monitor the readiness of the NPP safety systems for action, interact with the operational duty services of the Ministry for Emergency Situations, State Production Association “Belenergo” and Gosatomnadzor, create conditions for the work of the NPP emergency assistance group. The Crisis Center was put into operation before the delivery of nuclear fuel, as well as the main and backup means of communication with the Ministry of Emergency Situations, interested government agencies, territorial emergency management agencies and local executive and self-government bodies of settlements included in the NPP SA. To practice the actions of personnel in emergency conditions, the OO has developed methods and programs for preparing and conducting emergency drills, organized emergency drills in accordance with the established schedule. Gosatomnadzor takes an active part in conducting such drills both as part of supervisory activities and as part of training the personnel of the regulator's IAC. *At the same time, during such training in the OO scenario, the regulator practices the submission of additional (not provided for by the main scenario) inputs about changes in the operational situation at the unit. Such elements increase the effectiveness of emergency response training.*

<u>*Area of Good Performance:*</u>

The regulator practices introducing changes to the course of emergency response training of the OO by providing additional input for more effective practical training of elements of sudden changes in the operational situation at the unit.

During professional training of NPP personnel, technical means, including simulators of various types, are used to develop practical skills in NPP operation. Particular attention is paid to practicing actions in case of possible violations, including accidents, in NPP operation and taking into account operating experience. The Simulation Training Center with full-scale simulator began to function before the delivery of nuclear fuel to the site of the Belarusian NPP.

19 (v) Engineering and technical support

In order to ensure reliable and safe commissioning, operation and decommissioning of the NPP, JSC Russian State Concern for the Production of Electric and Thermal Energy at Nuclear Power Plants and the Republican Unitary Enterprise Belarusian Nuclear Power Plant signed an agreement on scientific and technical cooperation.

To provide technical support to the Belarusian NPP at the operation stage, it is planned to involve organizations that are part of the Ministry of Energy of the Republic of Belarus, as well as Russian companies: CNIITMASH JSC, NIKIMT-Atomstroy JSC, OKB Gidropress JSC, VNIIAES JSC, TVEL JSC, and the Kurchatov Institute National Research Center.

In order to perform technical maintenance, routine maintenance and repair of equipment for power units No. 1 and 2 of the Belarusian NPP at the operation stage, agreements were signed with Rosatom Service JSC (Russian Federation) and Belenergoremnaladka OJSC (Republic of Belarus).

19 (vi) Reporting of incidents significant to safety

Requirements for the procedure for notification and preparation of reporting documentation on events at NPPs are established in the standards and rules for ensuring nuclear and radiation safety [4.18], as well as in special licensing requirements and conditions of a special permit (license) of the OO.

Based on the requirements of [4.18], the OO has developed internal local procedures regulating the procedure for investigating events of various levels.

During the operation period (August 2022-2025) of power units No. 1 and No. 2 of the Belarusian NPP, 7 events occurred. Information on the events was provided to Gosatomnadzor in accordance with the established procedure. The events that took place, according to their characteristics and consequences, are classified as “Incidents”. Events with the characteristics and consequences of “Accidents”, as well as events with radiation consequences, exposure of personnel and the population were not recorded. According to the International Nuclear and Radiological Event Scale (INES), the events are classified as events that are not significant for safety – with a level of “0”. In accordance with regulatory requirements and local documents of the OO, investigations of the events were conducted, reports were developed, and corrective measures were developed and implemented. Based on the results of review of the reporting documentation, Gosatomnadzor, in accordance with the licensing requirements and conditions of the special permit (license), issued a permit to start up the power units after the shutdown. Also, the documents confirming the implementation of measures aimed at preventing similar events in the future were submitted to Gosatomnadzor. An analysis of the effectiveness of the measures and the facts of the absence of similar events during the period of commercial operation may indicate their effectiveness.

On a bilateral basis - within the framework of the concluded cooperation agreements – all information without exception on the events that occurred at power units No. 1 and No. 2 was submitted to WANO Moscow Center and Rosenergoatom Concern JSC that confirms the openness of the Belarusian NPP and its commitment to safety. The above is confirmed by the words of the IAEA Director General Rafael Mariano Grossi, who left a note in the book of honorary guests of the enterprise: “I would like to thank the staff and management of the Ostrovets NPP for their professionalism and excellent work, providing Belarus with safe, clean nuclear energy, and also for the fact that all this is done in full compliance with nuclear energy standards” [4.37].

Suggestion based on the results of the 8th and 9th Joint Meetings of the Contracting Parties:

"Timely share domestic events of interest at Belarusian NPP, with their associated lessons learned, through the IAEA/OECD-NEA International Reporting System (IRS)."

The suggestion is closed.

Preparation of the materials on operational experience for their transfer to the IAEA IRS information system is carried out in accordance with the Procedure for interaction between the Department for Nuclear and Radiation Safety of the Ministry for Emergency Situations of the Republic of Belarus and the State Enterprise "Belarusian NPP" in terms of transferring information on events to the IAEA International Reporting System on Operating Experience of NPPs. This Procedure defines the criteria for selecting information to be transferred, the procedure for interaction in preparing information, and the procedure for preparing and transferring information from the State Enterprise "Belarusian NPP" to Gosatomnadzor.

The events that meet the specified criteria are uploaded to the IAEA IRS system.

19 (vii) Operational experience feedback

During operation of a nuclear installation, the operating organization should ensure the collection, processing, analysis, systematization and storage of information on failures of safety-related system elements and incorrect actions of personnel, as well as its prompt transfer to all interested organizations.

Requirements for the functioning of the national operating experience accounting system are established in the standards and rules for ensuring nuclear and radiation safety [4.16].

Based on the requirements of [4.16], and taking into account the main recommendations set out in the IAEA and WANO documents, the operating organization has developed internal local procedures regulating the procedure for conducting an analysis of operating experience, including internal and external events.

From the internal and external operating experience, the operating organization selects information of interest for the training of operational and operational-repair personnel of the NPP. Such information is used as part of training materials in the process of training and maintaining the qualifications of NPP personnel.

Every year, in accordance with [4.16], a report on the analysis of operating experience is submitted to Gosatomnadzor, containing a generalized analysis of internal and external operating experience.

In order to organize work during the commissioning, operation and decommissioning of power units No. 1 and No. 2 of the Belarusian NPP in terms of transferring information on events at the Belarusian NPP to the IAEA International Reporting System on Operating Experience of NPPs, Gosatomnadzor together with the state enterprise Belarusian NPP has developed a corresponding interaction procedure.

Gosatomnadzor has developed the Procedure for interaction between Gosatomnadzor and the Scientific and Technical Center for Nuclear and Radiation Safety, which establishes a procedure for scientific and technical support of regulatory actions in the field of ensuring nuclear and radiation safety within the framework of the functioning of the system for accounting and analysis of operating experience of NPPs. This procedure is aimed at effectively using the results of the analysis of internal and external operating experience in regulatory activities.

The OO carries out activities to improve the safety of NPPs in accordance with plans drawn up taking into account the results of safety analyses and operating experience, in order to achieve safety targets. Despite the fact that the Belarusian NPP has little experience of its own in operating NPP power units (4 years of commercial operation), following the results of the first ever WANO operational peer review, a number of strengths of the Belarusian NPP operation can be recommended for use at other power plants around the world. Among them are the methodology for monitoring and managing the formation of liquid radioactive waste, the methodology and systems for conducting thermal tests of electrical equipment during repairs, as well as the management of hydraulic structure equipment in the winter period of the year in order to increase its efficiency and reliability. During the review, experts noted the high level of condition of the plant's equipment and premises, the safety culture of personnel and the level of openness of the plant for partner interaction [4.38].

The Republic of Belarus has taken steps to obtain the opportunity to study the operating experience of other countries, as well as the mechanisms for taking it into account and using it by regulatory authorities and operating organizations. Organizations providing information on external operating experience include international organizations, as well as operating organizations of other countries with which relevant agreements have been concluded on the exchange of operating experience. In order to exchange and take into account external operating experience and ensure reliable and safe commissioning, operation and decommissioning of the Belarusian NPP, the state enterprise Belarusian NPP has concluded the following agreements:

– an agreement on scientific and technical cooperation between the Joint-Stock Company Russian State Concern for the Production of Electric and Thermal Energy at Nuclear Power Plants (Russian Federation) and the Republican Unitary Enterprise Belarusian Nuclear Power Plant (Republic of Belarus);

– an agreement on cooperation between the State Enterprise Belarusian NPP and WANO Moscow Center.

In order to implement the obligations set out in the agreement with JSC Rosenergoatom, the Belarusian NPP has appointed persons responsible for the transmission and reception of information, who transmit information on internal operating experience and receive information on external operating experience.

In order to implement the obligations set out in the agreement with WANO Moscow Center, the Belarusian NPP has appointed contact persons for interaction between the Belarusian NPP and WANO Moscow Center, who have been granted access to WANO resources.

In order to ensure safe, reliable and efficient operation, the Belarusian NPP takes into account the operating experience of not only foreign NPPs, but also the operating experience of electric power facilities of the Republic of Belarus.

Highly qualified specialists of the Belarusian NPP have repeatedly taken part in events organized by the IAEA and WANO to exchange operating experience. Participation in these events once again demonstrates the high level of safety of the NPP construction project implemented in the Republic of Belarus, the openness of the Belarusian NPP to the international exchange of experience in safety issues, as well as the desire for continuous development and maintenance of a high level of involvement of the Belarusian NPP personnel.

Modifications at NPPs during operation and their safety assessments

Requirements for the implementation of activities related to the implementation of modifications at nuclear power plants and the assessment of their safety during commissioning and operation of NPPs, including the procedure for developing and implementing modifications at NPPs, modification categories depending on their impact on NPP safety, as well as the procedure for submitting reports during the development and implementation of modifications are established in the regulations and standards for nuclear and radiation safety [4.16], as well as in special licensing requirements and conditions of a special permit (license) of the operating organization (OO).

Based on the requirements of [4.16], the OO has developed internal local procedures regulating the procedure for organizing the planning and implementation of modifications to the systems and equipment of a nuclear power plant, as well as for the development and execution of documentation for permanent and temporary modifications.

The operating organization ensures that the safety assessment of temporary and permanent modifications is carried out in accordance with internal local procedures. During the operation period from 2022-2025, 188 technical solutions for permanent modifications were developed at power units No. 1 and No. 2 of the Belarusian NPP, 102 of which affect safety. Additionally, during the above-mentioned period, 84 temporary modifications were implemented at power units No. 1 and No. 2. Information on temporary and permanent modifications is provided to Gosatomnadzor in accordance with the established procedure in accordance with the requirements of the norms and rules for ensuring nuclear and radiation safety and special licensing requirements, and the conditions of the special permit (license) of the operating organization.

19 (viii) SNF and RW management at the site

SNF management

SNF management activities in the Republic of Belarus are regulated by [2.1, 2.2, 4.11, 4.14, 4.15, 84].

After unloading from the reactor, SNF is placed in the cooling pools of the at-reactor storage system for technological storage. The cooling pools are equipped with the necessary equipment and systems that ensure the reliable and safe performance of the following functions:

placement of SNF unloaded from the reactor during refueling, as well as placement of nuclear fuel of the entire core at any time;

storage of spent control rods of the control and protection system;

SNF storage to remove residual heat and reduce activity to the values required for SF transportation;

removal of residual heat from SNF;

ensuring biological protection of personnel from SNF stored in the cooling pool. The SNF storage system ensures the storage and aging of SNF in the reactor building of each power unit for 10 years, taking into account scheduled reloads and unloading of the entire reactor core at any time during the operation of the NPP power units.

As of June 2025, the spent fuel assemblies (SFA) of power unit No. 1 were unloaded during the 2024 scheduled maintenance period after the third fuel campaign of power unit No. 1. The spent fuel assemblies (SFA) of power unit No. 2 were unloaded during the 2024 scheduled maintenance period after the first fuel campaign.

According to the agreement between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the construction of a nuclear power plant in the Republic of Belarus dated March 15, 2011, the SFA are subject to return to the Russian Federation for reprocessing. Accordingly, the technological processes of the Belarusian NPP design provide for the SNF to be stored in the plant's storage system until parameters allow for transportation, placing the SNF in a transport cask (TUK-137T.R) and removing it from the reactor building to an open on-site reloading hub for subsequent shipment by a special railway train from the NPP territory.

In order to formulate and implement a technologically optimal, economically feasible, ecologically and socially safe state policy in the field of SNF management, the Strategy of SNF Management of the Belarusian NPP [3.16] (hereinafter referred to as the Strategy) was previously developed. The provisions of the Strategy define the key goals, objectives and organizational aspects of the creation and implementation of a national SNF management system. The priority option for managing SNF from the Belarusian NPP is the reprocessing of SNF in the Russian Federation with the return to the Republic of Belarus of waste included in a glass-like matrix containing radionuclides of the cesium-strontium fraction, with the exclusion of long-lived radionuclides.

The implementation of the measures provided for by the Strategy is carried out on the basis of mutually agreed plans.

As of July 2025, the following activities have been completed and are being implemented from the priority tasks for the implementation of the Strategy:

1. An agreement was concluded between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the transportation of nuclear materials, which entered into force on May 31, 2022;

2. An agreement was concluded between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the field of managing SNF from the Belarusian NPP, which entered into force on May 22, 2023;

3. Priority measures for the creation of an RWDF are being implemented;

A draft contract has been prepared, which defines the scope of cooperation and other conditions for the import of spent nuclear fuel to the Russian Federation, the processing of spent nuclear fuel from the Belarusian NPP, and the return of radioactive waste to the Republic of Belarus.

RW management

The main legislative act establishing requirements for ensuring radiation safety when managing RW is the Law of the Republic of Belarus “On Radiation Safety” [2.1].

There is a number of normative documents in force in the Republic of Belarus regulating safety issues of RW management.

The Resolution of the Council of Ministers of the Republic of Belarus [3.4] approved the Strategy for the Management of RW of the Belarusian NPP (hereinafter referred as the NPP RW Strategy). The NPP RW Strategy defines the ways of development of the Belarusian NPP RW management system, describes how the various types of RW of the Belarusian NPP will be managed at all stages of the waste life cycle, sets the deadlines for constructing a disposal facility, determines resources necessary to achieve the goals.

In accordance with the Belarusian NPP design, VLLRW, LLRW and ILRW will be stored in conditioned form in the NPP storage facilities for 10 years (the design period for filling the RW storage facilities), and then sent for final isolation in the RWDF. High-level radioactive waste will be stored in NPP storage facilities for the entire service life of the NPP and will be removed to the RWDF for final disposal at NPP decommissioning.

Based on NPP RW Strategy, a near-surface RWDF is planned to be constructed for VLLRW, LLRW and ILRW disposal.

The NPP RW management system is designed to collect, sort, process, condition, transport and store the RW generated during the NPP operation.

In the course of NPP operation, gaseous RW, liquid RW and solid RW are generated.

SRW Solid RW belong mainly to VLLRW, LLRW and ILRW categories. The amount of the high-level operational RW will constitute approximately 1% of the total amount of the waste.

The main tasks to be solved when managing NPP radioactive waste:

when managing gaseous waste – filtration to a state that meets sanitary standards;

when managing liquid radioactive waste – removal of radionuclides, concentration of radionuclides in a minimum volume with subsequent conditioning in order to convert liquid concentrated radioactive waste into forms convenient for storage;

when managing solid radioactive waste – minimization of volumes and their safe, reliable storage during the design period.

Solid VLLRW, LLRW and ILRW are packed in metal barrels with a capacity of 200 liters.

HLRW are collected in special metal capsules, loaded into shielded casks and transported to the solid radioactive waste storage compartment for storage during the entire service life of the NPP. Liquid radioactive waste after solidification are placed in reinforced concrete non-returnable protective containers. The expected annual volume of processed (solidified) liquid radioactive waste in reinforced concrete non-returnable protective containers per power unit will be approximately 33 m3.

Storage of barrels with SRW and non-returnable protective containers with solidified LRW is provided for at NPPs in specially equipped capital above-ground storage facilities, one for each power unit.

The projected average volume of annually generated radioactive waste, taking into account their processing, per NPP power unit is approximately 58 m3 of solid radioactive waste, including 0.5 m3 of HLRW, and (solidified) liquid radioactive waste in reinforced concrete non-returnable protective containers of approximately 33 m3.

The radioactive waste management system provides for reliable protection of workers (personnel) and the population from radiation exposure to radioactive waste in excess of the limits established by regulatory legal acts, and prevention of emissions (discharges) during radioactive waste management into the environment in quantities exceeding maximum permissible values.

In accordance with the norms and rules for ensuring nuclear and radiation safety [4.21], the OO should ensure the operation of NPPs with minimal formation of radioactive waste both in terms of their activity and quantity. In this regard, the OO has developed a Radioactive waste minimization program, which provides for organizational measures to minimize radioactive waste, standardization of radioactive waste formation and control over compliance with radioactive waste formation standards, and the procedure for planning radioactive waste formation in structural divisions.

Summary of significant changes since the previous National Report

The main systemic measures aimed at implementing the provisions of Articles 19 (i)-19 (vii) were carried out at the stage of preparation for the operation of the NPP – during the previous periods of preparation of National Reports. During the reported period, there were taken systemic steps to improve organizational and technical measures aimed at ensuring the safety of the plant.

As part of the implementation of the Strategy for SNF management of the Belarusian NPP [3.16], some of the priority measures were carried out:

an Agreement was concluded between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the field of SNF management of the Belarusian NPP, which entered into force on May 22, 2023;

an Agreement was concluded between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the transportation of nuclear materials, which entered into force on May 31, 2022;

a draft contract has been prepared, which will define the scope of cooperation and other conditions for the import of SNF into the Russian Federation, the reprocessing of SNF from the Belarusian NPP and the subsequent return to the Republic of Belarus of radioactive waste generated after the reprocessing of SNF;

a Strategy for the management of radioactive waste has been developed, within the framework of which the implementation of priority measures has begun to create a RW disposal facility, intended, among other things, for the long-term storage of returned waste from the reprocessing of SNF.

CONCLUSION

The Republic of Belarus takes the necessary measures at the national level to ensure that the fundamental principles of nuclear safety are observed at all stages of the life cycle of the Belarusian NPP. In 2022-2025, the country carried out measures to further improve the nuclear and radiation safety infrastructure and all its components, taking into account the IAEA safety standards, recommendations of international assessment missions and peer reviews, as well as the Challenges and Suggestions established by the Joint 8th and 9th Meetings of the Contracting Parties to the Convention.

During the next three-year cycle of the Convention, the main efforts will be focused on unconditional provision of nuclear and radiation safety of the power units of the Belarusian NPP in the mode of their commercial operation, as well as on the further improvement of the created infrastructure ensuring nuclear and radiation safety.

The Republic of Belarus continues to follow the principle of continuous improvement of the level of safety and proceeds from the fact that the key factor for the implementation of this principle is the exchange of international experience both within the framework of the Convention and within the framework of other instruments of international cooperation.

A full and open dialogue on issues of nuclear and radiation safety issues certainly contributes to improving nuclear safety at the national, regional and global levels.

REFERENCES

In preparing the National Report, there were used the documents with the references indicated directly in the text of the National Report, as well as the following legislative acts, agreements, scientific articles and speeches in official media:

1. International treaties and agreements

1.1. Convention on Early Notification of a Nuclear Accident (since 1987);

1.2. Convention on Assistance in the case of Nuclear Accident or Radiation Emergency (since 1987);

1.3. Convention on the Physical Protection of Nuclear Material (since 1993) and its Amendment (since 2023);

1.4. Convention on Nuclear Safety (since 1999);

1.5. Convention on Civil Liability for Nuclear Damage (Vienna Convention) (since 1998);

1.6. Protocol to amend the Vienna Convention on Civil Liability for Nuclear Damage (since 2003);

1.7. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (since 2003);

1.8. Agreement of 14 April 1995 between the Republic of Belarus and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (since 1995);

1.9. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Poland on prompt notification of nuclear accidents and cooperation in the field of radiation safety (1994);

1.10. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Austria on the exchange of information in the field of nuclear safety and protection from ionizing radiation (2000);

1.11. Agreement between the Government of the Republic of Belarus and the Cabinet of Ministers of Ukraine on Nuclear Accident Prompt Notification and Cooperation in the Field of Nuclear Safety (2001);

1.12. Agreement between the Government of the Republic of Belarus and the Government of the People's Republic of China on cooperation in the peaceful use of atomic energy (2008);

1.13. Agreement between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the field of peaceful uses of atomic energy (2009).

1.14. Agreement between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the construction of a nuclear power plant on the territory of the Republic of Belarus (2011);

1.15. Agreement between the Government of the Republic of Belarus and the Government of the Russian Federation on cooperation in the field of nuclear safety (2013);

1.16. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Armenia on information exchange and cooperation in the field of nuclear safety and radiation protection (2013);

1.17. Agreement between the Government of the Republic of Belarus and the Government of the Russian Federation on prompt notification of a nuclear accident and exchange of information in the field of nuclear and radiation safety (2013);

1.18. Agreement between the Government of the Republic of Belarus and the Government of the Republic of Latvia on prompt notification of nuclear accidents, exchange of information and cooperation in the field of nuclear safety and radiation protection (2018);

1.19. Agreement between the Ministry of Emergency Situations of the Republic of Belarus and the State Nuclear Energy Safety Inspectorate of the Republic of Lithuania on prompt notification of a nuclear accident and exchange of information on nuclear installations and nuclear activities (2020).

2. Main legislative acts

2.0. Constitution of the Republic of Belarus of 1994 (with amendments dated 04.03.2022);

2.1. Law of the Republic of Belarus No. 198-3 of June 18, 2019 “On Radiation Safety”;

2.2. Law of the Republic of Belarus No. 208-Z of October 10, 2022 “On Safety Regulation in the Use of Atomic Energy”;

2.3. Law of the Republic of Belarus No. 385-Z of May 26, 2012 “On Legal Regime of Territories Subjected to Radioactive Contamination as a Result of the Catastrophe at the Chernobyl Nuclear Power Plant”;

2.4. Law of the Republic of Belarus dated No. 141-Z of May 5, 1998 “On the Protection of Population and Territories from Emergency Situations of Natural and Man-Made Nature”;

2.5. Criminal Code of the Republic of Belarus No.275-Z of July 9, 1999;

2.6. Code of Administrative Offences of the Republic of Belarus No. 91-Z of January 6, 2021;

2.7. Decree of the President of the Republic of Belarus No. 137 of April 5, 2021 “On Regulation of Activities in the Field of the Use of Atomic Energy and Ionizing Radiation Sources”;

2.8. Decree of the President of the Republic of Belarus No. 427 of November 2, 2021 “On Improving the Radioactive Waste Management System”;

2.9. Decree of the President of the Republic of Belarus No. 499 of November 2, 2013 “On the Construction of the Belarusian Nuclear Power Plant”;

2.10. Decree of the President of the Republic of Belarus dated April 12, 2023 No. 101 “On the Organization of the Radioactive Waste Management System”;

2.11. Decree of the President of the Republic of Belarus No.565 of November 12, 2007 “On Several Measures Aimed at the Nuclear Power Plant Construction”;

2.12. Decree of the President of the Republic of Belarus No. 62 of February 16, 2015 “On Ensuring Safety During the Construction of the Belarusian Nuclear Power Plant”;

2.13. Decree of the President of the Republic of Belarus No. 361 of October 5, 2017 “On the Establishment of an Institution”;

2.14. Decree of the President of the Republic of Belarus No. 279 of May 28, 2010 “On Determination of the State Body Responsible for the Implementation of Obligations under Certain International Agreements”;

2.15. Decree of the President of the Republic of Belarus No. 405 of November 14, 2022 “On the Ministry for Emergency Situations”;

2.16. Decree of the President of the Republic of Belarus No. 124 of March 29, 2011 “On Measures to Implement International Agreements in the Field of Civil Liability for Nuclear Damage”;

2.17. Decree of the President of the Republic of Belarus No. 32 of January 26, 2021 “On the Funds of the Belarusian Nuclear Power Plant”;

2.18. Decree of the President of the Republic of Belarus No. 15 of January 14, 2019 “On Liability for Nuclear Damage”;

2.19. Decision of the All-Belarusian People's Assembly of April 25, 2024 “On Approval of the National Security Concept of the Republic of Belarus”.

Other legal acts

3. Resolutions of the Government

3.1. Resolution of the Council of Ministers of the Republic of Belarus No. 535 of August 15, 2023 “On the Main Directions of Implementing a Unified State Policy in the Field of Ensuring Nuclear and Radiation Safety”;

3.2. Resolution of the Council of Ministers of the Republic of Belarus No. 668 of October 9, 2023 “On Implementing the Law of the Republic of Belarus No. 208-Z of October 10, 2022 “On Safety Regulation in the Use of Atomic Energy”;

3.3. Resolution of the Council of Ministers of the Republic of Belarus No. 128 of February 15, 2023 “On the Strategy of Radioactive Waste Management”;

3.4. Resolution of the Council of Ministers of the Republic of Belarus No. 460 of June 2, 2015 “On Approving the Strategy of Radioactive Waste Management of the Belarusian Nuclear Power Plant” with amendments dated March 18, 2021;

3.5. Resolution of the Council of Ministers of the Republic of Belarus No. 497 of August 21, 2020 “On Implementing the Law of the Republic of Belarus No. 198-Z of June 18, 2019 “On Radiation Safety”;

3.6. Resolution of the Council of Ministers of the Republic of Belarus No. 558 of October 6, 2021 “On Implementing the Decree of the President of the Republic of Belarus No. 137 of April 5, 2021” with amendments dated May 15, 2025;

3.7. Resolution of the Council of Ministers of the Republic of Belarus dated No. 862 of December 1, 2023 “On Amending the Resolution of the Council of Ministers of the Republic of Belarus No. 558 of October 6, 2021”;

3.8. Resolution of the Council of Ministers of the Republic of Belarus No. 158 of March 7, 2024 “On the Establishment of the State Commission for the Priority Site Selection for Radioactive Waste Disposal Facility Construction”;

3.9. Resolution of the Council of Ministers of the Republic of Belarus No. 57 of January 29, 2021 “On the State Program “Education and Youth Policy” for 2021-2025”;

3.10. Resolution of the Council of Ministers of the Republic of Belarus No. 258 of April 24, 2019 “On Approval of the Regulation on Public Hearings on Safety Regulation of the Belarusian Nuclear Power Plant” with amendments dated October 09, 2023;

3.11. Resolution of the Council of Ministers of the Republic of Belarus No. 854 of October 14, 2015 “On Permits Issue for Work Performance in the Implementation of Activities in the Field of Atomic Energy Use” with amendments dated October 9, 2023;

3.12. Resolution of the Council of Ministers of the Republic of Belarus No. 495 of April 10, 2001 “On the State System of Prevention and Liquidation of Emergency Situations”;

3.13. Resolution of the Council of Ministers of the Republic of Belarus No. 1280 of August 23, 2001 “On the Procedure for Collecting Information in the Field of Protecting the Population and Territories from Natural and Man-Made Emergencies and Exchanging this Information” with amendments dated January 24, 2017;

3.14. Resolution of the Council of Ministers of the Republic of Belarus No. 37 of January 25, 2021 “On Approval of the Hygienic Standards “Criteria for Assessing Radiation Exposure” with amendments dated November 29, 2022;

3.15. Resolution of the Council of Ministers of the Republic of Belarus No. 576 of May 17, 2004 “On Radiation Monitoring and the Use of its Data” with amendments of February 27, 2024;

3.16. Resolution of the Council of Ministers of the Republic of Belarus No. 558 of August 22, 2019 “On the Strategy of Spent Nuclear Fuel Management of the Belarusian Nuclear Power Plant” with amendments dated October 09, 2023;

3.17. Resolution of the Council of Ministers of the Republic of Belarus No. 37 of January 25, 2021 "On Approval of the Hygienic Standards" with amendments dated January 12, 2025.

4. Resolutions (orders) of the Ministry for Emergency Situations and other government bodies, including norms and rules for ensuring nuclear and radiation safety, safety guidelines:

4.1. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 64 of September 21, 2021 "On requirements for the composition and content of documents justifying nuclear and radiation safety" with amendments dated November 15, 2023;

4.2. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 35 of April 25, 2019 "On the lists of works (services) and equipment for nuclear facilities" with amendments dated November 15, 2023;

4.3. Resolution of the Ministry for Emergency Situations of the Republic No. 59 of November 15, 2023 "On the regulation of activities in the field of the use of atomic energy and ionizing radiation sources" with amendments dated May 28, 2025;

4.4. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No.33 of March 28, 2022 "On approval of regulations of administrative procedures";

4.5. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 58 of September 6, 2021 "On procedure for conducting a periodic safety assessment of nuclear facility, storage facility, disposal facility" with amendments dated June 05, 2023;

4.6. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 18 of April 16, 2020 "On training and verification (assessment) of knowledge on nuclear and radiation safety" with amendments dated November 15, 2023;

4.7. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 16 of April 13, 2020 "On approval of the Instruction on the procedure for accounting and control of ionizing radiation sources" with amendments dated May 13, 2023;

4.8. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 41 of August 2, 2005 "On approval of the Instructions for information provision in the field of civil and territory protection against natural and man-made emergencies" with amendments dated November 30, 2009;

4.9. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 33 of July 31, 2020 "On the information and control system of the State System of Prevention and Elimination of Emergency Situations" with amendments dated March 23, 2022;

4.10. Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 59 of September 06, 2021 "On the requirements for the content of the report on the assessment of the current state of safety" with amendments dated June 5, 2023;

4.11. Safety rules for nuclear fuel storage and transportation at the complexes of storage systems and SNF management, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 72 of December 30, 2006 with amendments dated March 30, 2022;

4.12. Resolution of the Ministry of Energy of the Republic of Belarus No. 2 of January 12, 2024 "On determining the categories of employees";

4.13. Regulation on the procedure for accounting exposure received by the population and personnel, approved by the Resolution of the Ministry of Health of the Republic of Belarus No. 110 of November 27, 2020;

4.14. Norms and rules for ensuring nuclear and radiation safety "General provisions for ensuring the safety of nuclear power plants", approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No.15 of April 13, 2020 with amendments dated September 26, 2023;

4.15. Norms and rules for ensuring nuclear and radiation safety “Rules for nuclear safety of reactor installations of nuclear power plants”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 42 of June 16, 2021;

4.16. Norms and rules for ensuring nuclear and radiation safety “Procedure for implementation of modifications at nuclear power plants and modifications safety assessment”; “Requirements for the operation of recording and analysing systems for nuclear power plant operational experience”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 34 of July 27, 2017 with amendments dated December 17, 2020 and October 22, 2024, respectively;

4.17. Norms and rules for ensuring nuclear and radiation safety “General requirements for the operating organization management systems in order to ensure nuclear and radiation safety”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 73 of October 18, 2021 with amendments dated June 8, 2023;

4.18. Norms and rules for ensuring nuclear and radiation safety “Requirements for assigning an emergency class, the procedure for announcing emergency situation, and the prompt information transfer in the event of a nuclear and (or) radiation emergency at a nuclear power plant”, “The procedure for investigating and accounting for violations in the operation of nuclear power plants”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 52 of October 2, 2018 with amendments dated October 25, 2021;

4.19. Norms and rules for ensuring nuclear and radiation safety “Requirements for the program for managing the aging of nuclear power plants” approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 61 of December 6, 2018 with amendments dated June 23, 2023;

4.20. Norms and rules for ensuring nuclear and radiation safety “Safety in ionizing radiation sources management. General provisions” approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 47 of September 28, 2010 with amendments dated June 5, 2023;

4.21. Norms and rules for ensuring nuclear and radiation safety “Safety rules for handling radioactive waste from nuclear power plants” approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 43 of October 12, 2017 with amendments dated May 4, 2023;

4.22. Norms and rules for ensuring nuclear and radiation safety “Nuclear power plants safety in the sanitary protection zone and the supervised area. Requirements for the organization and provision of radiation monitoring”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 29 of June 30, 2016 with amendments dated April 13, 2020;

4.23. Norms and rules for ensuring nuclear and radiation safety “Safety in ionizing radiation sources management. General provisions”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 42 of October 19, 2020 with amendments dated March 17, 2023;

4.24. Norms and rules for ensuring nuclear and radiation safety “Requirements for categorization of emergency planning in the event of a nuclear and (or) radiation accident”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 38 of August 21, 2017 with amendments dated May 12, 2023;

4.25. Norms and rules for ensuring nuclear and radiation safety “Safety of nuclear power stations. Requirements for the development of emergency preparedness and response measures in the event of a radiation accident”, approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 24 of June 2, 2017 with amendments dated December 30, 2020;

4.26. Norms and rules for ensuring nuclear and radiation safety "Requirements for the composition and content of the action plan for the protection of personnel in the event of an accident at a nuclear research facility", approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 43 of August 8, 2018;

4.27. Norms and rules for ensuring nuclear and radiation safety "Safety of nuclear power plants in the event of a nuclear and (or) radiological emergency. Requirements for planning and ensuring radiation monitoring", approved by the Resolution of the Ministry for Emergency Situations of the Republic of Belarus No. 11 of April 12, 2017 with amendments dated July 22, 2021;

4.28. Sanitary norms and rules "Radiation safety requirements", approved by the Resolution of the Ministry of Health of the Republic of Belarus No. 213 of December 28, 2012;

4.29. Sanitary norms and rules "Hygienic requirements for the design and operation of nuclear power plants", approved by the Resolution of the Ministry of Health of the Republic of Belarus No. 39 of March 31, 2010;

4.30. Sanitary norms and rules "Requirements for radiation safety of personnel and population in exercising activities on the use of atomic energy and ionizing radiation sources", approved by the Resolution of the Ministry of Health of the Republic of Belarus No. 137 of December 31, 2013;

4.31. Sanitary norms and rules "Requirements for radiation safety of personnel and population in radioactive waste management", approved by the Resolution of the Ministry of Health of the Republic of Belarus No. 142 of December 31, 2015;

4.32. TCP (technical code of common practice) 101-2007 "Siting of nuclear power plants. procedure for developing a general quality assurance program for a nuclear power plant";

4.33. TCP (technical code of common practice) 099-2007 "Siting of nuclear power plants. Guidance on the development and contents of justifications for the environmental safety of nuclear power plants";

4.34. TCP (technical code of common practice) 102-2007 "Siting of power plants. Procedure for developing a quality assurance program when selecting a site for a nuclear power plant";

4.35. Nuclear and radiation Safety guidelines "Ensuring safety culture at all stages of the life cycle of the Belarusian NPP", approved by the Order of Gosatomnadzor No. 7 of February 4, 2022;

4.36. Nuclear and radiation safety guidelines "Recommendations for safety assessment of modifications at nuclear power plants", approved by the Order of the Department for Nuclear and Radiation Safety No. 92 of December 30, 2021;

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4.39. Journal "Nuclear and Radiation Safety" No. 2 (116)-2025, article "Classification of technical legal acts in the field of nuclear and radiation safety as a basis for the classification of knowledge areas: experience of the Republic of Belarus" (Safonov R.A., Astashko G.A., Mazurenko M.V., Krysin A.I.), UDC: 349. DOI: 10.26277/SECNRS.2025.116.2.005. *https://nrs-journal.ru/sections/international/Classification_Technical_5_116/*.