

## **DEVELOPMENT STRATEGY**

for the Department on nuclear and radiation safety  
of the Ministry of Emergency Situations

Status: September 2015

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## **1 Introduction**

In modern fast-changing conditions, elaboration of development strategy for an organization becomes a basis for its improvement allowing adequately estimate the situation, understand its internal advantages and shortcomings, reveal potential opportunities and threats of the outside world and, according to them, define objectives and priorities of the development. Development of strategic vision becomes the key to success of organization development, a basis for its long-term and sustainable growth, allows, effectively using the available resources, adequately and timely to address the challenges.

This document represents the strategy of development of the Department for nuclear and radiation safety of the Ministry of Emergency Situations of the Republic of Belarus (Gosatomnadzor) for the short-term period of 2016-2018.

Created pursuant to the Decree of the President of the Republic of Belarus No. 565 dated November 12, 2007 "On some measures for the nuclear power plant construction", Gosatomnadzor is a structural subdivision acting as a legal entity of the central office of the Ministry of Emergency Situations of the Republic of Belarus (MES) which is exercising special functions in the field of nuclear and radiation safety assurance.

The first two chapters of the document are dedicated to presentation of external (boundary) conditions of activity and internal conditions for functioning of the Department. The analysis of current state, provided in these chapters, allowed to identify the strategic areas of Gosatomnadzor improvement. The third part of the document is dedicated to the short description of areas to be improved.

## **2 Boundary (external) conditions**

### **2.1 Development of national nuclear program and creation of the first NPP in the Republic of Belarus**

Formation of the nuclear power industry begun in the Republic of Belarus in the mid-sixties of the last century. However, after the Chernobyl accident, Belarus rejected the program of nuclear power industry development. A research nuclear reactor in Belarus and a pilot mobile NPP "Pamir-630D" 630 kW were decommissioned, construction of NPP for heating the city of Minsk was terminated.

The first steps on revision of decisions on rejection to use nuclear power were taken in 2006. In July, 2006, the Government of the Republic of Belarus made the decision to consider the possibility of inclusion of nuclear power into the development plan for national power industry and to allocate the required budgetary funds. The decision on beginning of the development of nuclear power industry in Belarus implied creation of sustainable national infrastructure enabling to render the governmental, legislative, regulating, technical, personnel and industrial support to its implementation process.

Pursuant to the Decree of the President of the Republic of Belarus No. 756 (2006) [1], the Ministry of Emergency Situations of the Republic of Belarus is determined as the state administrative body exercising regulation and control including in the field of nuclear and radiation safety. Objectives of state supervision in the field of nuclear and radiation safety assurance, control for compliance with the legislation in the field of nuclear and radiation safety assurance are assigned to the Department on nuclear and radiation safety of the Ministry of Emergency Situations (Gosatomnadzor). According

to the regulation, Gosatomnadzor is the structural subdivision, acting as a legal entity of the ministry, provided with special functions in the field of nuclear and radiation safety assurance.

The concept of power security and strengthening of power independence of the Republic of Belarus has been approved by the decree of the President of the Republic of Belarus No. 433 (2007) [2]. The decree envisaged construction of the nuclear power plant with general capacity of up to 2000 MW.

The main aspects of organization of preparatory work for construction of the NPP in the Republic of Belarus and nuclear and radiation safety assurance are stated in the Decree of the President dated November 12, 2007 No. 565 "On some measures for construction of the nuclear power plant" [3]. In pursuance of this Decree in December, 2007, public institution "Management of construction of the nuclear power plant" was established.

In January 31, 2008, the resolution of the Security Council of the Republic of Belarus No. 1 "On development of the nuclear power in the Republic of Belarus" [4] was accepted, in which it was decided to carry out construction of the nuclear power plant in the Republic of Belarus.

Pursuant to the Decree of the President of the Republic of Belarus of July 10, 2008 No. 378 (as worded 4.12.2013) "On creation of the Department on nuclear power industry of the Ministry of Energy and introduction of amendments into some decrees of the President of the Republic of Belarus" [5], the Department of nuclear energy of the Ministry of Energy of the Republic of Belarus was established for implementation of the state policy in the field of development of nuclear power industry in the Republic of Belarus, assurance of safe placement, designing, construction, commissioning, operation and decommissioning of the NPP in accordance with the legislative requirements.

In May, 2009, in Minsk, the Agreement between the Government of the Russian Federation and the Government of the Republic of Belarus on cooperation for peaceful use of nuclear energy was concluded, in which the directions of cooperation between the parties and forms of its implementation were identified.

Within the Strategy of development of energy potential of the Republic of Belarus approved by the resolution of the Council of Ministers of the Republic of Belarus dated August 9, 2010 No. 1180 "On the adoption of strategy of development of energy potential of the Republic of Belarus" [6], construction by 2020 of two power units of the nuclear power plant with the overall capacity of 2340 MW is defined as the potential of industries of fuel and energy complex of the country.

In October, 2011, the Contractual agreement on construction of the power units No. 1 and No. 2 of the Belarusian nuclear power plant [7] was signed, and in November 2011 the intergovernmental agreement on providing the Russian Federation with export credit loan [8] was signed.

The general contract for construction of the nuclear power plant in the Republic of Belarus with "Atomstroyexport" was signed in July, 2012. All works on construction of the NPP performed by the general contractor on a turnkey basis.

Three points of possible location of the NPP were considered (Shklovsko-Goretsky, Bykhovskiy, Ostrovetskiy) on which three potential sites were further identified (Ostrovetskiy, Krasnopolyanskiy and Kukshinovskiy). On the specified sites, the complex of survey works was carried out and their comparative analysis to select the priority site

for construction of the NPP was performed. It is revealed that Ostrovetsky site has the best geological characteristics and water supply, it was identified as priority (main) one. At the stage of justification of investment into construction, the environmental impact assessment (EIA) was carried out. According to the EIA report, during Belarusian NPP operation, there will be no transboundary impact and considerable threats for long distances.

Within the EIA procedure, discussions of the EIA report for interested parties in Kiev (Ukraine), in Vienna (Austria), for the Lithuanian public in Vilnius (March, 2011) and in Ostrovets (Belarus) were carried out (August, 2013).

On May 31, 2012, the license for NPP location in the Ostrovets site in the Grodno region was issued for the governmental institution "Directorate of construction of the nuclear power plant" by the Ministry of Emergency Situations of the Republic of Belarus. The owner of the license for NPP location has the right to carry out activity in the field of nuclear energy use regarding nuclear installation arrangement (according to the global practice, such activity includes engineering survey and research on the power unit site and top-priority works of the construction preparatory period before filling concrete in base plates of main buildings and constructions). By the results of the state environmental assessment, the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus agreed the project documentation of the "Belarusian NPP" (Agreement No. 98 dated October 23, 2013) [9]. September 13, 2013, the governmental institution "Management of Construction of the Nuclear Power Plant" obtained the license for the first stage of construction of the power unit No. 1 of Belarusian NPP.

The beginning of construction of the NPP approved by the Decree of the President of the Republic of Belarus dated November 02, 2013 No. 499 "On construction of the Belarusian nuclear power plant" [10] became the next step of the national nuclear program development. By the decree of the President of the Republic of Belarus of dated December 30, 2013 No. 583 "On reorganization of the governmental institution "Directorate of construction of the nuclear power plant" [11], the institution has been reorganized into the republican unitary enterprise "Belarusian Nuclear Power Plant" (The state enterprise "Belarusian NPP"). The enterprise exercises functions of client on construction and operator (operating organization) for commissioning, operation, restriction of operational characteristics, operational lifetime extension and decommissioning of Belarusian NPP.

Now, two power units of Russian manufacture AES-2006 with the overall electric capacity of up to 2400 (two thousand four hundred) MW with the reactor facility V-491 are under construction.

The commissioning time of the first power unit is 2018, the second one – 2020.

## **2.2 Legal and regulatory framework**

The strategy of development of energy potential of the Republic of Belarus specified in 2010 has established, among other things, the need of development and acceptance of a package of legal and technical norms which have to stipulate conditions and requirements of safe development of power industry in the Republic of Belarus, radioactive waste management and physical protection of nuclear and radiation facilities, including:

technical regulatory legal acts regulating requirements to the design of the NPP;

requirements imposed to systems of the nuclear facilities influencing nuclear and radiation safety;

technical regulatory legal acts regulating requirements to performance of physical and power start-up of a nuclear facility;

requirements imposed to operating personnel of nuclear facilities and storages of radioactive waste;

technical regulatory legal acts regulating storage conditions and transportations of nuclear materials and radioactive materials;

technical regulatory legal acts regulating supervision and control of safe use of nuclear energy and nuclear materials in the Republic of Belarus;

technical regulatory legal acts regulating safe radioactive waste management;

technical requirements to quality programs at all cycles of NPP functioning in the territory of the Republic of Belarus;

technical regulatory legal acts on certification of the equipment, products and technologies for nuclear facilities.

Formation of regulatory legal framework in the field of nuclear energy use is one of the leading areas of Gosatomnadzor current activity. When developing documents, recommendations of IAEA, the Russian Federation and other countries with the developed nuclear power industry shall be considered.

The developed national system of legal regulation in the field of nuclear energy use, nuclear and radiation safety has hierarchical structure, which provides subordination of the requirements of lower level documents to the relevant requirements of the documents of higher hierarchical levels, and is presented in the form of a pyramid (fig. 1).

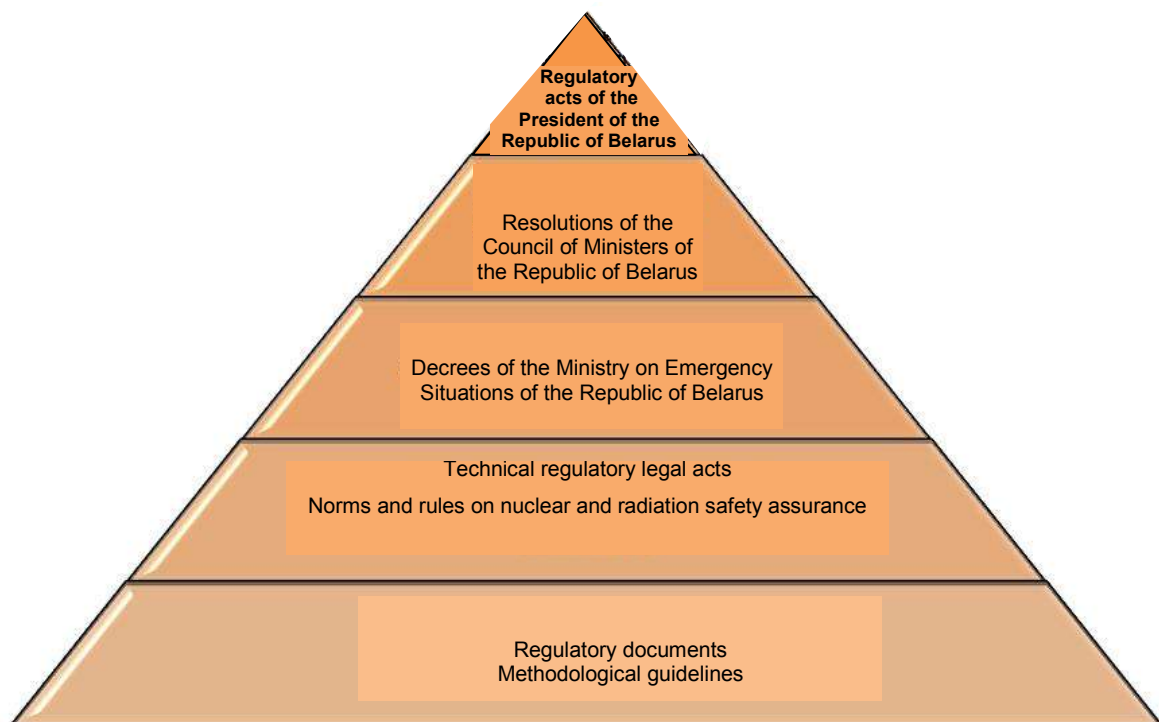


Fig. 1 The system of legal regulation in the Republic of Belarus

The system of legal regulation consists from:

Constitution of the Republic of Belarus;

conventions, laws, international treaties and laws on ratification of international treaties which the Republic of Belarus has joined;

regulatory legal acts (RLA) adopted by the President of the Republic of Belarus and the Security Council of the Republic of Belarus;

regulatory legal acts (RLA) adopted by the Council of Ministers of the Republic of Belarus;

regulatory legal acts (RLA) and technical regulatory legal acts (TRLA) concerning nuclear and radiation safety assurance, safe use of nuclear facilities adopted by the Ministry of Emergency Situations and other state administrative bodies of the Republic of Belarus.

Legal framework for nuclear power industry development in the Republic of Belarus consists of the following key regulatory legal acts:

The Law of the Republic of Belarus dated January 05, 1998 No. 122-3 "On radiation safety of population" [12];

The Law of the Republic of Belarus dated July 30, 2008 No. 426-3 "On nuclear energy use" [13];

The decree of the President of the Republic of Belarus dated November 12, 2007 No. 565 "On some measures for construction of the nuclear power plant" [3];

The decree of the President of the Republic of Belarus dated September 1, 2010 No. 450 "On licensing of separate kinds of activity" [14];

The decree of the President of the Republic of Belarus dated February 16, 2015 No. 62 "On safety assurance during construction of the Belarusian nuclear power plant" [15].

Part of the national legislation in the field of nuclear energy use constitutes a number of international treaties and laws on ratification of international treaties which the Republic of Belarus has joined:

The convention on the operational notification on nuclear accident and the Convention on aid in case of nuclear accident or radiation situation (ratified by the Decree of Presidium of the Supreme Council of the Republic of Belarus No. 1216-XI dated December 18, 1986) [16];

The convention on physical protection of nuclear material (ratified by the Resolution of Presidium of the Supreme Council No. 2381-HP dated June 14, 1993) [17];

The convention on nuclear safety (ratified by the Decree of the President of the Republic of Belarus of September 02, 1998 No. 430) [18];

The integrated convention on safety of spent fuel and radioactive waste management (ratified in accordance with the Law of the Republic of Belarus dated July 17, 2002 No. 130-Z) [19];

The Nuclear Non-Proliferation Treaty (No. 2166-XI, ratified by the Resolution of the Supreme Council of the Republic of Belarus of February 04, 1993) [20] etc.

Among the RLA stipulating development of nuclear power industry, accepted by the Council of Ministers of the Republic of Belarus:



the Resolution of the Council of Ministers of the Republic of Belarus dated May 24, 1993 No. 338 "On measures for physical protection of nuclear materials" [21];

the Resolution of the Council of Ministers of the Republic of Belarus dated December 31, 2008 No. 2056 "On some issues of implementation of the state supervision in the field of industrial safety, safety of transportation of dangerous freights, nuclear and radiation safety assurance" [22];

the Resolution of the Council of Ministers of the Republic of Belarus dated September 27, 2010 No. 1385 "On adoption of the Regulation on physical protection of nuclear facilities" [23];

the Resolution of the Council of Ministers of the Republic of Belarus dated December 07, 2010 No. 1781 "On adoption of the Regulation on procedure of expert review of the documents justifying nuclear and radiation safety assurance during implementation of activity in the field of nuclear energy and ionizing radiation sources use" [24];

the Resolution of the Council of Ministers of the Republic of Belarus on adoption of the government programs: "Training of personnel for nuclear power industry of the Republic of Belarus for 2008-2020" No. 1329 dated September 10, 2008 [25] and "Scientific support for the nuclear power industry development in the Republic of Belarus for 2009-2010 and for the period till 2020" dated August 28, 2009 No. 1116 [26].

TRLA in the field of nuclear and radiation safety, safe use of nuclear facilities and ionizing radiation sources include norms and rules on nuclear and radiation safety assurance, technical codes of common practice (TCP), standards. These regulatory documents stipulate the requirements which are considered as necessary for safety assurance and are subject to unconditional observance by all agents who fall under their action.

As of September 30, 2015, the Ministry of Emergency Situations of the Republic of Belarus approved 52 TRLA in the field of nuclear and radiation safety. Among them: 21 - rules, norms and standards on nuclear and radiation safety assurance; 31 - technical codes of common practice, including 4 TCP approved by the Ministry of Emergency Situations jointly with the Ministry of Building and Architecture, the Ministry of Energy and the Ministry Natural Resources, and 3 TCP - with the Ministry of Internal Affairs and SSC. Besides, a number of the regulatory and methodical documents regulating issues of interaction between government bodies for prevention and elimination of emergency situations, on licensing and safety assessment in the field of nuclear energy use and others.

Considering large scope of the required regulatory legal acts, the Republic made the decision to apply technical regulatory legal acts of the Russian Federation in the field of nuclear and radiation safety assurance within the Belarusian NPP construction site at construction stage in the absence of the Belarusian documents regulating these legal relationship. There is an active work on the organization of processing, development and adaptation to the national legislation of regulatory documents of the Russian Federation in the field of nuclear and radiation safety assurance for construction of NPP and other areas of ionizing radiation sources use.

Presently, preparation of regulatory legal acts is carried out within three planned documents:

1. The state program "Scientific support to nuclear power industry development in the Republic of Belarus for 2009-2010 and for the period till 2020" [26];
2. Schedule of development and processing of up-to-date regulatory legal acts in the field of nuclear and radiation safety assurance, required in relation to implementation of the project of Belarusian NPP approved by the First Deputy Prime Minister of the Republic of Belarus V. I. Semashko 7.3.2013;
3. The plan of development/revision of RLA by Gosatomnadzor in the field of the nuclear and radiation safety assurance for 2015-2016 approved by the head of Gosatomnadzor 2.13.2015.

### 2.3 Government control in the field of nuclear energy use

In the Republic of Belarus, government control in the field of nuclear energy use and government regulation of activities for safety assurance in the field of nuclear energy use are stipulated by chapter 2 of the Law of the Republic of Belarus "On Nuclear Energy Use" [13].

The government control in the field of nuclear energy use in accordance with the present Law and other legal acts shall be carried out by the Ministry of Energy of the Republic of Belarus, the Ministry of Emergency Situations of the Republic of Belarus as well as other state administrative bodies and other governmental organizations authorized by the President of the Republic of Belarus.

The state administrative bodies exercising governmental control of activities for safety assurance when using nuclear energy are: the Ministry of Emergency Situations of the Republic of Belarus, the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus, the Ministry of Health of the Republic of Belarus, the Ministry of Internal Affairs of the Republic of Belarus, State Security Committee of the Republic of Belarus.

Figure 2 presents the structure of governmental control in the field of nuclear energy use in the Republic of Belarus.

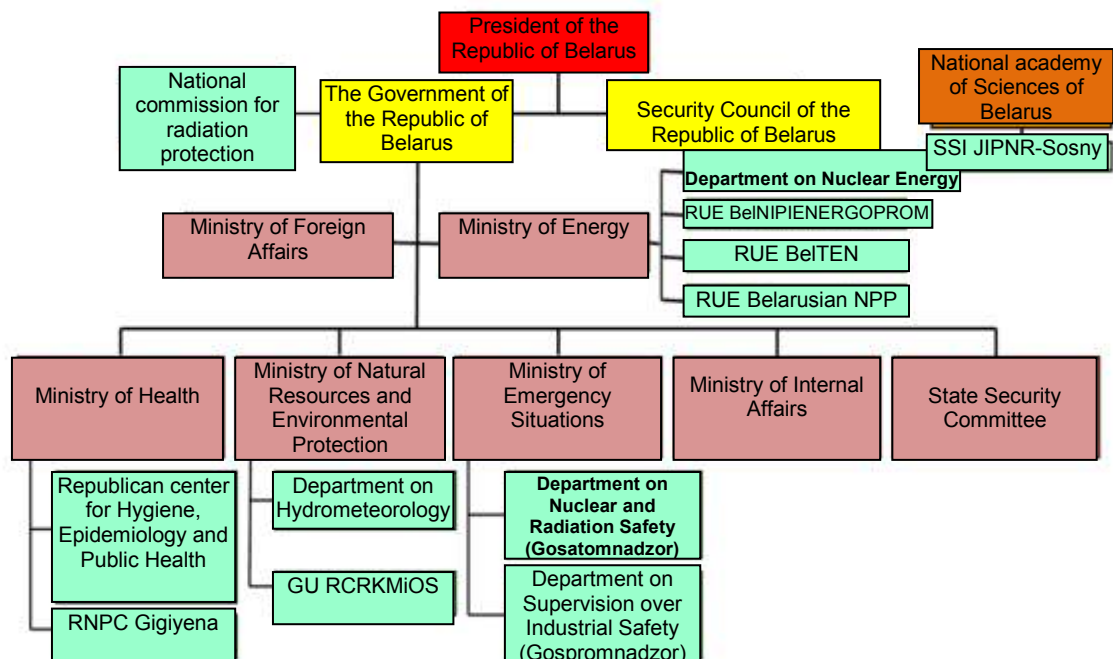


Fig.2 The structure of the government control in the field of nuclear energy use in the Republic of Belarus

The government control of activities on safety assurance in the field of nuclear energy use shall be exercised by:

the President of the Republic of Belarus (<http://www.president.gov.by/>), which shall:

determine the main directions of state policy in the field of nuclear energy use;

approve government target programs;

take decisions on placement, designing, construction, commissioning, lifetime extension, restriction of operational characteristics and a decommissioning of a nuclear power plant or its unit;

determine state administrative body or other governmental organization under which a nuclear power plant is subordinated to;

take decisions on safety assurance, population and environmental protection when using nuclear energy;

take decisions on prevention and elimination of consequences of emergency situations when using nuclear energy;

be entitled to determine the government bodies and other organizations ensuring development of nuclear energy use and their competence in this area;

take decisions on placement, designing, construction, commissioning, lifetime extension, restriction of operational characteristics and decommissioning of nuclear facility (except for a nuclear power plant or its unit) and (or) storage point;

exercise other powers in accordance with the legislation of the Republic of Belarus.

The Council of Ministers of the Republic of Belarus (<http://government.gov.by/>) shall:

determine state administrative body or other state organization which nuclear facility and (or) storage point are subordinated to (except for the nuclear power plant);

provide implementation of state policy in the field of nuclear energy use;

determine procedure of discussion of issues in this area with participation of public associations, other organizations and citizens;

coordinate activity of government bodies and governmental organizations;

organize development and ensure implementation of government target programs;

ensure compensation for the harm resulted from adverse effects of ionizing radiation or activities for nuclear energy use, in accordance with the legislation of the Republic of Belarus;

determine conditions and procedure of assurance of physical protection of nuclear facilities;

determine a procedure of the state supervision for assurance of physical protection of nuclear facilities;

take measures for ensuring implementation of international treaties of the Republic of Belarus in this area;

coordinate the international cooperation of the Republic of Belarus;

exercise other powers in accordance with the legislation of the Republic of Belarus.

The authorized state administrative bodies exercising government control of activities for safety assurance when using nuclear energy are:

Ministry of Emergency Situations of the Republic of Belarus (<http://rescue01.gov.by/>);

Ministry of Natural Resources and Environmental Protection of the Republic of Belarus (<http://www.minpriroda.gov.by/>);

Ministry of Health of the Republic of Belarus (<http://minzdrav.gov.by/>);

Ministry of Internal Affairs of the Republic of Belarus (<http://mvd.gov.by/>);

State Security Committee of the Republic of Belarus (<http://www.kgb.by/>).

The Ministry of Emergency Situations of the Republic of Belarus shall:

exercise state supervision in the field of nuclear and radiation safety assurance as well as for the assurance of physical protection of nuclear facilities;

organize and exercise the state supervision over the management of spent nuclear materials and operational radioactive waste;

exercise control of observance of the legislation in the field of nuclear and radiation safety assurance;

participate in organization and implementation of work on conformance assessment of equipment, products and technologies for nuclear facilities;

ensure functioning of uniform state system of recordkeeping and control of ionizing radiation sources and the state system of recordkeeping and control of nuclear materials of the Republic of Belarus;

organize safety expertise of nuclear installation and (or) storage point as well as their projects, including involvement of independent experts;

exercise other powers in accordance with the legislation of the Republic of Belarus.

Other government bodies within their competence shall:

exercise control of assurance of physical protection of nuclear facilities;

agree on programs of commissioning and decommissioning of a nuclear facility and (or) storage point;

participate in development and implementation of the external emergency plan;

agree on technical regulatory legal acts in the field of nuclear energy use;

exercise other powers in accordance with the legislation of the Republic of Belarus.

Local government authorities shall:

organize and participate in discussion of issues in the field of nuclear energy use with participation of public associations, other organizations and citizens;

participate in measures on safety protection of citizens and environment against effects of ionizing radiation exceeding the limits specified by technical regulatory legal acts in the field of nuclear energy use;

exercise control within the relevant administrative and territorial unit of readiness of organizations and citizens for actions in case of radiation accident during implementation of activities in nuclear energy use;

participate in elimination, restriction or decrease in consequences of radiation accident arisen when implementing activities for nuclear energy use;

inform citizens through local mass media on a radiation situation within the relevant administrative and territorial unit;

exercise other powers in accordance with the legislation of the Republic of Belarus.

## **2.4 The system of personnel training for nuclear power industry**

The national system of personnel training necessary for providing nuclear power industry with highly qualified specialists as well as for further maintenance of an appropriate level of knowledge for safe, reliable and effective operation of NPP has been developed in the country. The system of personnel training includes a complex of organizational and technical measures of state administrative bodies, highest and secondary special educational institutions, technological training schools, other governmental organizations.

For personnel training in the field of nuclear power industry in Belarus, the Government program for personnel training for nuclear power industry of the Republic of Belarus for 2008-2020 is under implementation [25], aiming at organization of system of personnel comprehensive training providing acquisition of knowledge and skills required for construction and safe operation of NPP, nuclear and radiation safety assurance, safety of NPP personnel, population and the environment.

Proceeding from the needs, on the basis of requests of government bodies (organizations), the state order for personnel training has been formed: scopes of training, retraining, upgrading (maintenance) of qualification of experts, high-skilled scientists specified and arranged by years in a section of specialties and personnel; educational institutions which presently conduct training have been identified; training plans presented by years in the relevant educational institutions.

Under the government program:

in higher educational institutions of the country (educational institutions "The Belarusian national technical university", "The Belarusian state university of informatics and radio electronics", "The Belarusian state university", "A.D.Sakharov international ecological university"), training of students on eight new specialties in the field of nuclear power industry has started, the overall annual amount of preparation is equal to 220 people;

training of teachers and scientific workers of higher educational institutions abroad organized;

production practice of students in the countries of the developed nuclear power industry.

In 2008, training of specialists in higher educational and secondary special educational institutions of the Republic on new specialties such as "Nuclear physics and technologies", "Construction of thermal and nuclear power plants", "Steam-turbine installations of nuclear power plants", "Electronic control and management systems at nuclear power plants", etc. has started.

The program of training of specialists of higher education for NPP operation includes basic (5-5.5 years) training in higher education institutions of the Republic of Belarus, including production practice abroad, special (0.5-3 years) training of specialists having experience of work at the power industry enterprises of the Republic of Belarus, in foreign higher education institutions, having passed internship at the operating nuclear facilities abroad, preparation according to individual programs at the educational and training center (ETC) at the NPP.

Proceeding from the priority importance of issues of personnel training for the nuclear power program, the IAEA technical cooperation program "Development of personnel potential and training system of experts for the nuclear power program" is presently under implementation in the Republic of Belarus, the Ministry of Energy along with the Ministry of Education and the National Academy of Sciences of Belarus have been determined as its coordinator. This program envisages provision of expert and consultation support on the issues of creation of personnel training system for the nuclear power industry taking into account the international experience and recommendations of IAEA, and includes holding of seminars and trainings, visits of Belarusian scientists and teachers of higher education institutions to the NPPs educational and training centers and research institutes abroad, visit by Belarusian experts to acting NPPs and the NPPs under construction as well as development and delivery of the computer training system for the organizations participating in implementation of the project of NPP construction in the Republic of Belarus.

## 2.5 Other nuclear installations in Belarus

Along with the nuclear power plant under construction, the following nuclear installations are located in Belarus.

At the Joint institute for nuclear and power research of Academy of Sciences of the Republic of Belarus, two research critical assemblies "Hyacinth" and "Crystal", the subcritical Yalina stand and storage of non-irradiated nuclear material "Yavar" are in operation. The storage point for nuclear materials in "Iskra" complex is under construction.

## 2.6 Adjacent power units of NPPs relating to the other states

Four power units of nuclear power plants of Lithuania, Ukraine and Russia (Fig.) are located in close proximity to the Republic of Belarus, determining the necessity to develop the actions for a case of emergency situations.

Table 1. The adjacent NPPs close to the boundaries of Belarus

NPP	Reactor type	Remoteness from the boundary
Ignalina NPP Lithuania	2 x RBMK 1500 MW Decommissioned in December 2009	approximately 4 km
Smolensk NPP Russia	3 x RBMK 1000 MW	approximately 25 km
Chernobyl NPP	3 x RBMK 1000 MW	approximately 12 km



Ukraine	Decommissioned in December 2000	
Rivne NPP	2 x VVER 440 MW (213 type)	approximately 65 km
Ukraine	1 x VVER 1000 MW 1 x VVER 1000 MW	

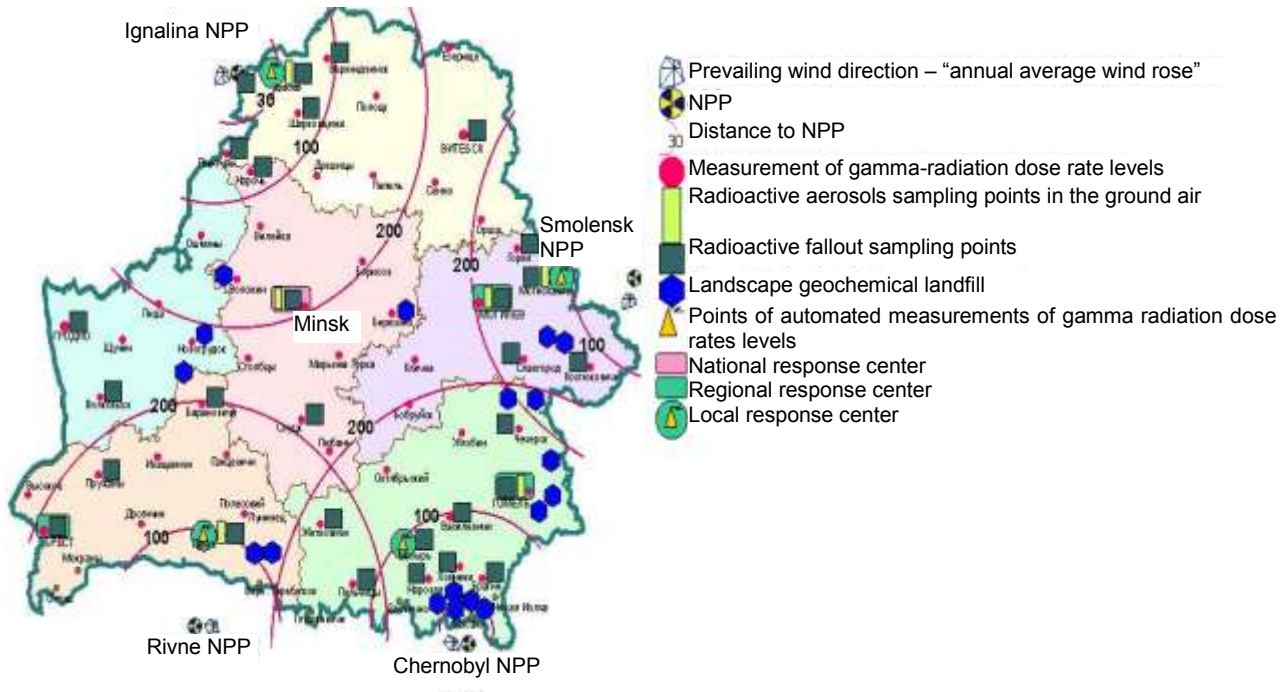


Рис.3. NPPs close to the boundaries of the Republic of Belarus

### 3 Internal conditions

By the decision of the President of the Republic of Belarus dated 11/12/2007 within the structure of MES, a separate structural subdivision was created with formation of a legal entity granted with powers to implement supervision in the sphere of nuclear and radiation safety – the Department for Nuclear and Radiation Safety (*Gosatomnadzor*).

Gosatomnadzor is led by a Head, who is assigned and dismissed from the position by the President of the Republic of Belarus upon recommendation of the Minister of Emergency Situations. The Head of Gosatomnadzor is subordinated to the Minister of Emergency Situations, manages the activity of Gosatomnadzor and is personally responsible for performance of tasks and functions imposed on Gosatomnadzor. Financing of Gosatomnadzor activity is provided by means of state budget and other sources in accordance with the legislation. Information on activity of Gosatomnadzor is presented on the web-site [www.gosatomnadzor.gov.by](http://www.gosatomnadzor.gov.by).

The stage of Belarusian NPP construction imposes on regulatory body additional tasks in supervision and regulation. With entering the Belarusian NPP construction project into the active phase and proceeding from the results of the analysis of structure, quantity and performed functions of the regulatory bodies of countries operating 1-2 NPP, since July 1, 2013, the number of administration office workers of Gosatomnadzor was risen by 43 staffing position and made up 82 units with creation of local

subdivision directly at the NPP construction site. In the structure of Gosatomnadzor, 8 new subdivisions were created, 43 new workers were recruited, 16 of which are young specialists (graduates of specialized higher educational institutions).

The current structure of Gosatomnadzor is presented in the figure.

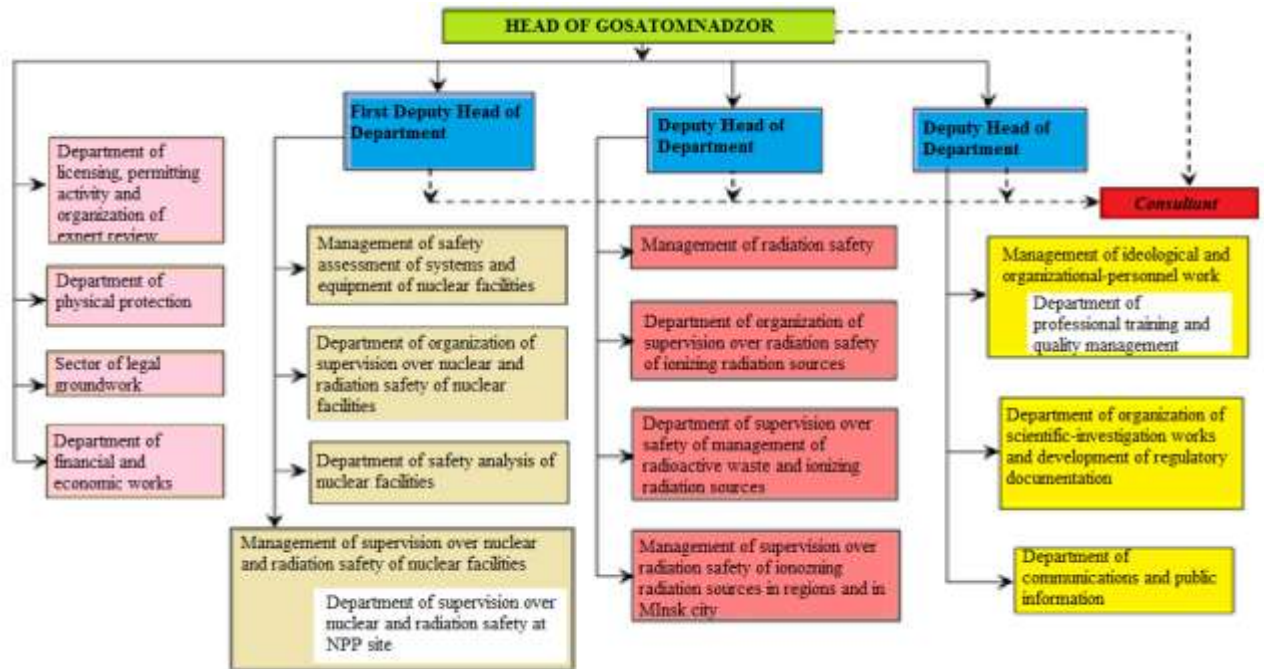


Fig.4. Current structure of Gosatomnadzor

### 3.1 Main tasks and functions of Gosatomnadzor

Main tasks of Gosatomnadzor shall be the following:

state supervision in the field of nuclear and radiation safety assurance;

control over compliance with legislation in the field of nuclear and radiation safety assurance.

In accordance with the tasks imposed on Gosatomnadzor, it shall perform the following functions:

analyze practice of legislation appliance in the field of nuclear energy use, nuclear and radiation safety and develop propositions on its improvement;

form the corresponding divisions of the list of norms and rules in the field of nuclear energy use, nuclear and radiation safety approved by MES;

participate in MES issuing to organizations and individual entrepreneurs under the established procedure of special permissions (licenses) on performance of activity



related to ionizing radiation sources, nuclear materials, radiation protection means and technological equipment for nuclear materials and ionizing radiation sources;

establish requirements on content of the documents substantiating assurance of nuclear and radiation safety of nuclear facility, radiation source, storage point for nuclear materials and ionizing radiation sources (hereinafter, storage point) and activity related to ionizing radiation sources, nuclear materials, radiation protection means and technological equipment for nuclear materials and ionizing radiation sources;

organize safety assessment of nuclear facilities, nuclear power facilities, radiation sources and storage points including involvement of independent experts, as well as expert review of their design and engineering-design documentation;

within its competence, organize and perform state supervision over:

- licensees compliance with license requirements and conditions in the field of nuclear energy use and ionizing radiation sources;
- management of radioactive waste and spent nuclear materials, their utilization and disposal;
- assurance of physical protection of nuclear materials and facilities, radiation sources, storage points;
- planning of protective measures on safety assurance of working personnel and population in case of nuclear and radiation accidents;
- compliance with the requirements of regulatory legal acts and technical regulatory legal acts in the field of assurance of nuclear and radiation safety during designing (construction), production, storage, installation, operation and decommissioning of equipment and systems of nuclear facilities, nuclear power facilities, radiation sources and storage points;

organize scientific research on substantiation of principles and criteria for nuclear and radiation safety, enhancement of efficiency of state supervision in the field of nuclear and radiation safety assurance during nuclear energy use, involves scientific organizations, scientists and specialists, including foreign, in performance of corresponding scientific research;

review and make under the established procedure proposals on drafts of programs (plans) for research and development, directed at substantiation and enhancement of safety of designed, constructed, reconstructed and operating nuclear facilities, nuclear power facilities, radiation sources and storage points;

organize performance of certification and verification of computational programs, creation and maintaining of databases for analysis of safety of nuclear facilities, radiation sources and storage points, ensures functioning of state system of record-keeping and control of nuclear materials of the Republic of Belarus, unified state system of record-keeping and control of ionizing radiation sources, system of physical protection of nuclear materials and facilities, nuclear power facilities, radiation sources, storage points;

determine requirements on content and procedure of submission to GosAtomNadzor of information on violations in work of radiation facilities, nuclear facilities, nuclear power facilities;

establish the procedure of investigation of circumstances and reasons causing violations in work of radiation facilities, nuclear facilities, nuclear power facilities and perform such investigation;

organize development of requirements and conditions excluding possibility of commitment of terroristic acts at radiation facilities, nuclear facilities, nuclear power facilities and storage points;

participate in organization and performance of works on certification of equipment, products and technologies for nuclear facilities, nuclear power facilities, radiation sources and storage points;

organize issuance of regulatory legal acts, technical regulatory legal acts, information and reference and other documents necessary for implementation and improvement of activity in the field of nuclear and radiation safety assurance;

organize professional training, retraining, enhancement of qualification and internship of workers of Gosatomnadzor;

develop and submit to state administrative bodies, local executive and regulatory bodies and other organizations proposals on enhancement of stability of functioning of radiation facilities, nuclear facilities, nuclear power facilities, which are necessary for consideration;

take part in work of:

- commissions on preliminary, periodic and acceptance testing of equipment and technical devices applied at radiation facilities, nuclear facilities, nuclear power facilities;
- special commissions on selection of places for radioactive waste disposal;

perform control over:

- compliance with the requirements of norms and rules in the field of nuclear energy use;
- fulfillment of international commitments of the Republic of Belarus on assurance of nuclear and radiation safety during nuclear energy and ionizing radiation sources use;
- organization and performance of professional training, retraining and qualification enhancement, training of personnel of radiation and nuclear facilities to operate safely at radiation facilities, nuclear facilities, nuclear power facilities;
- implementation of measures on enhancement of accident-prevention stability and safety of radiation facilities, nuclear facilities, nuclear power facilities;

in accordance with legislation informs public on safety status of radiation facilities, nuclear facilities, nuclear power facilities;

develop and submit to MES:

- procedure of legislation knowledge assessment in the field of nuclear energy and ionizing radiation sources use, nuclear and radiation safety of leaders and

specialists of organizations and individual entrepreneurs, operating ionizing radiation sources, nuclear facilities, nuclear power facilities, as well as performing works and providing services in the field of nuclear energy use, issuance of special permissions (licenses) on activity related to production, use, processing and storage of nuclear materials, designing (construction), production, storage, installing of ionizing radiation sources, radiation protection means and technological equipment for nuclear materials and ionizing radiation sources;

- proposals on coordination of activity of state administrative bodies, local executive and regulatory bodies, other organizations on nuclear and radiation safety assurance;
- proposals on nuclear and radiation safety assurance for their use during preparation of annual report to the Council of Ministers of the Republic of Belarus on current situation in the field of protection of population and territories from emergency situations of natural and man-caused origin;

ensure within its competence protection of data constituting state secrets;

check work of state administrative bodies, other governmental organizations subordinated to the Government of the Republic of Belarus on issues of radiation safety assurance, performance by officials of the responsibilities in this field imposed on them;

consider under the established procedure requests of organizations and citizens on issues related to its competence;

perform other functions envisaged by the legislation.

GosAtomNadzor for implementation of its tasks and functions has a right to:

develop and submit for consideration to MES administration the proposals on issues related to its competence including drafts of regulatory legal acts, drafts of technical regulatory legal acts;

involve under the established procedure:

- qualified specialists to participation in conduction of expertise and safety status inspections of radioactive facilities, nuclear facilities, nuclear power facilities;
- on a contract basis, scientific organizations, higher educational institutions and other organizations for preparation of proposals on drafts of comprehensive and target programs, development of drafts of regulatory legal acts, technical regulatory legal acts in the field of assurance of nuclear and radiation safety;

perform external economic activity in accordance with the legislation;

request and receive from state bodies and other organizations, under the established procedure, information on issues related to its competence;

issue instructions on elimination of violations in the field of nuclear and radiation safety assurance necessary for implementation by organizations and individual entrepreneurs operating ionizing radiation sources, nuclear facilities, nuclear power facilities

exercise other powers in accordance with its tasks and functions.

### 3.2 Licensing activity of Gosatomnadzor

The basic document regulating licensing activity in the field of nuclear energy and ionizing radiation sources use in the Republic of Belarus is the Regulation on licensing of separate types of activity approved by the Decree of the President of the Republic of Belarus No.450 (2010) [14], which entered into force on January 1, 2011.

Regulation consists of two sections, the first section regulates general issues on licensing, the second regulates specific features of licensing of certain types of activity, including in the field of nuclear energy and ionizing radiation sources use (chapter 13).

The requirements on content and composition of documents substantiating assurance of nuclear and radiation safety during implementation of activity in the field of nuclear energy and ionizing radiation sources use are determined by the Decree of the Ministry of Emergency Situations of the Republic of Belarus No. 58 dated November 30, 2010 “On approval of norms and rules on nuclear and radiation safety assurance” [27].

Licensing of activity in the field of nuclear energy and ionizing radiation sources use in the Republic of Belarus shall be performed by the Ministry of Emergency Situations. For specification of compliance with the legislation on licensing, the regulation “On licensing activity in the field of industrial safety, nuclear energy and ionizing radiation sources use, activity related to performance of control over radioactive contamination, activity on fire safety assurance” [28] No.52 dated November 30, 2010, is adopted by the Ministry.

The stages of licensing process in the field of nuclear energy and ionizing radiation sources use are presented in the figure.

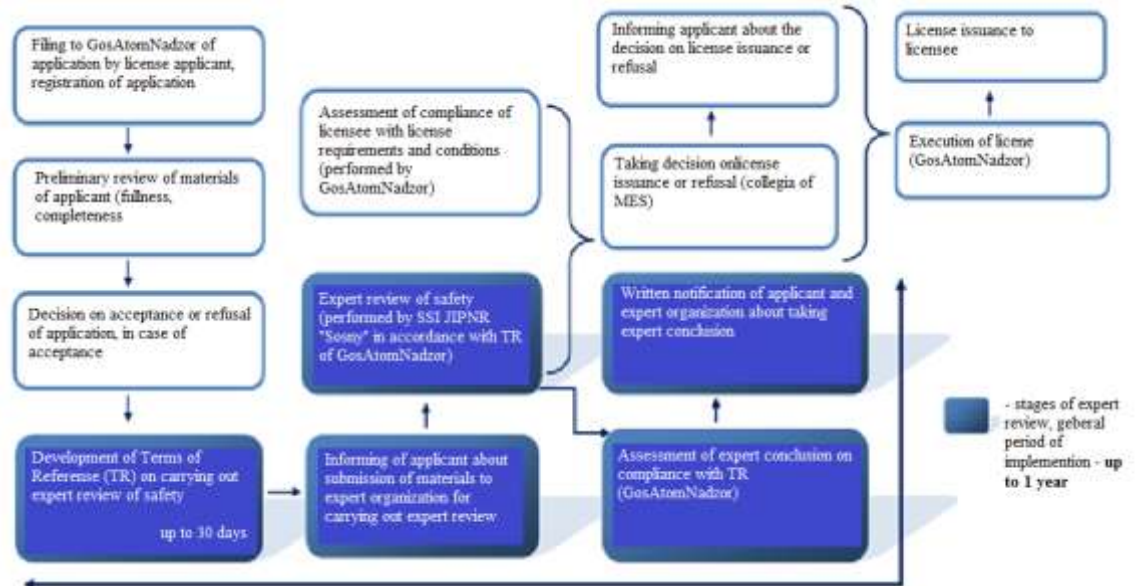


Fig.5. The stages of licensing process in the Republic of Belarus

On the basis of safety assurance conclusions prepared by Gosatomnadzor, MES Board made a decision on issuance of the following licenses:

RUE “Belniplerienergoprom” on designing in the field of nuclear energy and ionizing radiation sources use, 06.08.2010;

SSI JIPNR “Sosny” of NAS of Belarus on performance of safety expertise, 25.11.2011;

SI “Directorate of nuclear power plant construction” on arrangement of nuclear power plant, 31.05.2012;

SI “Directorate of nuclear power plant construction” for the first stage of unit No.1 construction, 13.09.2013;

RUE “Belarusian NPP” for the first stage of unit No.2 construction, 14.02.2014;

RUE “Belarusian NPP” on construction of nuclear facilities (construction of unit No.1, erection of basements and foundations of unit No.2 buildings and constructions), 22.04.2014;

RUE “Belarusian NPP” on construction of nuclear facilities (units No.1 and No.2), 30.12.2014.

Table 2 contains basic stages/tasks of licensing-permitting activity of Gosatomnadzor for the period of construction and commissioning of unit No.1 of Belarusian NPP (2015-2019).

Table 2

<b>Basic stages of licensing-permitting activity of Belarusian NPP</b>	<b>Dates</b>	<b>Tasks to be solved</b>
Obtainment of license on construction (LC)	April 2014	Expert review of <b>POOB</b> and LC issuance
The first package of documents/response of operating organization (OO) on license conditions	May2015	Approvals and expert review
Licensing plan of OO	April 2015	Approval, development of internal plan of licensing-permitting activity
The second package of documents/response of OO on license conditions	November 2015	Approvals and expert review
Authorization activity and supervision during construction	Constantly	Approvals and permissions, technical assistance
Submission of application on license amendments in terms of operation of	October 2016	Expert review of <i>FSAR</i> and design-operation documentation

unit No.1 of Belarusian NPP		
Beginning of pre-commissioning works (PCW)	May 2017	Expert review of program and PCW results
Obtainment of license for operation (LO)	January 2018	Preparation of LO conditions and LO issuance
Delivery of nuclear fuel	January 2018	Permission
Physical start-up	April 2018	Permission, expert review of program and results of physical start-up
Power start-up	May 2018	Permissions, expert review of program and power start-up
Trial operation	December 2018	Permissions, expert review, programs and results of trial operation
Preliminary acceptance of unit No. 1	June 2019	Permission
Safety reassessment, introduction of amendments into license and obtainment of permissions at the stage of Operation	Constantly	Expert review, approval, issuance of permissions, licenses

Stages and tasks of license-permitting activity of GosAtomNadzor during the period of construction and start-up of unit No.2 of Belarusian NPP are identical.

Thus, at the current stage, licensing body issued to operating organization (RUE “Belarusian nuclear power plant”) license on all stages of construction of units No.1 and No.2 of Belarusian NPP (April 22, 2014 and December 30, 2014 respectively) and performs controlling (supervisory) activity on license fulfillment of conditions of validity of the issued licenses.

In the field of ionizing radiation sources use, 599 licenses have been issued as of September 30, 2015.

### 3.3 Performance of control (supervision) on Belarusian NPP construction

In relation to the beginning of preparatory works on nuclear power plant construction in the Republic of Belarus and with the purpose of control (supervision) over nuclear and radiation safety assurance, the procedure of organization and implementation of state supervision in the field of nuclear and radiation safety assurance is determined by the resolution of the Council of Ministers of the Republic of Belarus No. 2056 (2008) [22].

Pursuant to the Resolution of the Council of Ministers of the Republic of Belarus “On establishment of working team for coordination of state control (supervision) over construction of nuclear power plant” No.1791 dated December 30, 2011 [29], a working team was formed out of the representatives of controlling (supervisory) bodies of the Republic of Belarus, as a leader of the group the first Deputy Minister of Emergency Situation was assigned.

With the purpose of achievement and maintenance of the appropriate level of Belarusian NPP safety, as well as performance of commitments accepted by the Republic of Belarus in accordance with the Convention on Nuclear Safety [18], by the Decree of the President of the Republic of Belarus No.62 (2015) [15] established was a specific procedure of organization and performance of control (supervision) over safety assurance during construction and commissioning of Belarusian NPP. This procedure is determined in the Regulation approved by the Resolution of the Council of Ministers of the Republic of Belarus “On approval of Regulation on organization and performance of control (supervision) over safety assurance during construction and commissioning of Belarusian nuclear power plant” No. 133 dated February 25, 2015 [30].

Pursuant to this regulation, regime of continuous control (supervision) is implemented at the site of Belarusian NPP construction. GosAtomNadzor established constant presence at the facility of nine workers according to staff schedule and implementation by them of control (supervisory) measures aimed at operative assessment of safety status.

Continuous control (supervision) regime is a regime which envisages performance of inspections within its competence by controlling (supervisory) bodies for operative assessment of safety condition during construction and commissioning of Belarusian NPP with granting them authorities with purpose of prevention and restraint of violations and elimination of consequences of their harmful consequences and with periodicity established by controlling (supervisory) bodies as well as implementation of measures of preventative and warning character [30].

The decree [15] determines the list of controlling (supervisory) bodies performing control (supervision) over safety assurance during construction and commissioning of Belarusian NPP:

1. State |Committee on Standardization:

Department of control and supervision over construction, specialized inspection of the Department of control and supervision over construction – in terms of control over compliance with the requirements of technical regulatory legal acts during construction, approved design documentation during performance of construction and installation works, as well as over compliance of the materials, products and structures used during construction with design decisions and requirements of mandatory technical regulatory

legal acts in the field of technical rate setting and standardization with the purpose of operation reliability and safety assurance;

state metrological supervision bodies – in terms of state metrological supervision;

bodies of state supervision over compliance with the requirements of technical regulations and standards – in terms of supervision over compliance with mandatory technical regulatory legal acts in the field of technical rate setting and standardization, control (supervision) over fulfillment of the requirements of the legislation on compliance assessment related to obligatory compliance confirmation.

2. The Ministry of Health – in terms of control over quality of medical aid rendered to Belarusian NPP workers and members of their families at organizations and individual entrepreneurs carrying out medical activity as well as performance of medical examination of such workers and members of their;

3. Bodies and institutions performing state sanitary supervision – in terms of state sanitary supervision over compliance with the legislation in the field of sanitary-epidemiological wellbeing of population;

4. The Ministry of Emergency Situations:

Department of supervision over safe conduction of works in industry – in terms of state supervision in the field of industrial safety;

Department of nuclear and radiation safety – in terms of control (supervision) over compliance with the legislation in the field of nuclear and radiation safety assurance during activity in nuclear energy use;

bodies of state fire supervision – in terms of state fire supervision, supervision over compliance with the legislation during activity in fire safety assurance;

bodies and departments of state supervision and control over activity in protection of population and territories against emergency situations of natural and man-made origin, as well as civil defense.

5. The Ministry of Natural Resources and Environmental Protection and its territorial bodies – in terms of control in the field of environmental protection, reasonable use of natural resources.

6. Department of state inspection of the Ministry of Labor and Social Protection – in terms of supervision over compliance with the legislation in safety and labor protection;

7. Bodies of state power and gas supervision of the Ministry of Energy – in terms of state power and gas supervision;

8. The Ministry of Internal Affairs – in terms of control over security activity;

9. General Directorate of internal military forces commander– in terms of control over compliance with the requirements of the approved design documentation during performance of construction and installing works on equipping **Belatobelarussian NPP** with the complex of engineer and technical means of physical protection.

Coordination of interaction of controlling (supervisory) bodies during organization and performance of control (supervision) over safety assurance during construction and



commissioning of Belarusian nuclear power plant shall be performed by the Ministry of Emergency Situations.

Safety supervision shall be performed via inspections on compliance with the approved design documentation, during which controlling (supervisory) bodies check compliance with the requirements of regulatory legal acts of the Republic of Belarus, technical regulations of Customs Union and technical regulatory legal acts of Russian Federation, in accordance with which works on construction and commissioning of Belarusian NPP shall be implemented.

During construction and commissioning of Belarusian NPP, the following types of inspections shall be performed:

comprehensive;

in the regime of continuous control (supervision).

The comprehensive inspections shall be organized by the Ministry of Emergency Situations on the basis of schedule of NPP construction and at suggestion of control (supervisory) bodies.

Decision on performance of comprehensive inspection shall be made by working team which forms composition of commission for comprehensive inspection by the representatives of controlling (supervisory) bodies and assigns its leader.

### **3.4 Control over manufacturing of equipment for Belarusian NPP**

In 2014 specialists of the department within the framework of performance of supervisory measures at producing plants started implementation of control functions at enterprises in Saint Petersburg and Volgodonsk (Russia) which produce equipment for Belarusian NPP.

In order to intensify control over production and acceptance of equipment for Belarusian NPP and transfer from one-time-basis measures to systematic and continuous supervision, in 2015 Plan of GosAtomNadzor on activities inspections of RUE “Belarusian NPP” at the plants producing equipment for Belarusian NPP (Inspection Plan) was developed and realized.

In support of the performed supervisory measures, Instruction on procedure of performance of control (supervision) over production, installing and adjustment of equipment of nuclear facilities was developed and approved by the Order of the Head of GosAtomNadzor No.15 dated 25.04.2015.

Within the framework of realization of Plan of inspections, the following measures were performed:

inspection of performance of acceptance testing combined with acceptance inspection of the tanks for collection of leakages from sump tank lining at JSC “EDB Akademicheskoe” of NAS of Belarus;

inspection of acceptance of key event “Build-up welding of shell rings and bottom, pre-machining during welding (control of compliance with operating construction and engineering documentation) of reactor vessel for power unit No.1 of Belarusian NPP” (branch of A/S “AEM-technologies” “Atomash”, Volgodonsk, Russian Federation);

unscheduled inspection (inspected activity – development and production of commutator cap of primary circuit for Belarusian NPP).

During activity on control over quality assurance of equipment of nuclear facilities a working meeting took place (minutes were prepared) with the representatives of RUE “Belarusian NPP”, NIAEP “Dzerzhynskhimmash” on the issue of coordination of estimated parameters of pressure during hydraulic testing of tanks which arrive at Belarusian NPP site.

Activity on record-keeping of operational experience was intensified:

draft of concept on creation of state system of operational experience record-keeping is developed and submitted for consideration to interested structural subdivisions of Gosatomnadzor;

system of record-keeping of equipment important to safety, pipelines, pressure vessels is prepared and draft of instruction on the procedure of its maintenance is developed (at the approval stage);

prepared Tentative list of technologic equipment for nuclear facilities, designing and production of which is subject to licensing (1,2,3 safety class).

In support of the performed supervisory measures at producing plants, organized and performed is constant work on provision of consulting services to Gosatomnadzor by Federal State Unitary Enterprise VO “Bezopasnost” (FSUE VO “Bezopasnost”).

### 3.5 Human resourcing and qualification enhancement

Today in Gosatomnadzor there are 72 specialists, 15 of which are young specialists (graduates of specialized higher educational institutions of 2013-15 years). During two years, 43 new workers were employed, including 16 young specialists out of best graduates of 4 specialized higher educational institutions of Belarus who received specialized education in the field of physics, radiation chemistry, as well as engineer subjects. Distribution of workers according to the basic education is presented at figure 5.

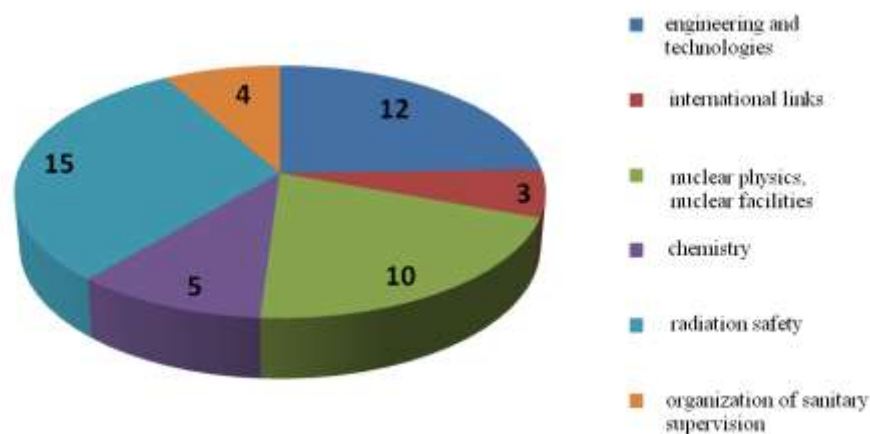


Fig.5. Basic education of workers of Gosatomnadzor

Up-to-date age distribution of specialists is presented in the following figure.

Age distribution of workers of GosAtomNadzor

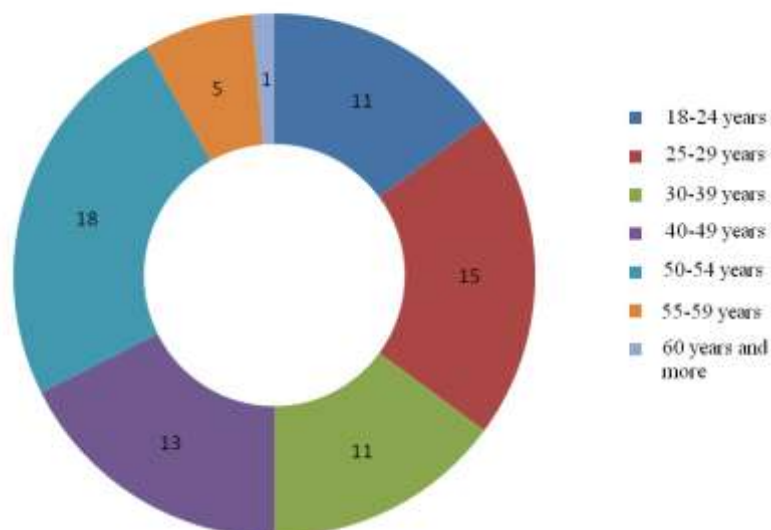


Fig.6. Age distribution of workers of Gosatomnadzor

For formation of stable collective, organized is work on recruitment of specialists for vacant positions and formation of personnel reserve. Within the framework of filling vacancies of Gosatomnadzor missing job profiles are formed.

For enhancement of competence level of specialists of Gosatomnadzor all the available resources are used:

system of primary training of young specialists on general issues of nuclear and radiation safety and implementation of regulatory activity is organized. On regular basis without interruption of current activity, training on normative legal documents regulating issues of NPP safety justification is performed;

enhancement of the level of competence of specialists of GosAtomNadzor is performed within the framework of the Government program of specialists training for nuclear energy of the Republic of Belarus for 2008-2020 years;

international projects and agreements are implemented – IAEA project “Enhancement of professional level of regulatory body in nuclear and radiation safety”(BYE9020), ongoing cooperation with European Union on projects of international technical assistance “Development of technical cooperation in nuclear safety in the field of support to regulatory bodies” (BY3.01/09 BE/RA/07) and “Support and assistance in enhancement of possibilities of Belarus body in nuclear regulation MES/Gosatomnadzor in the field of licensing and supervision over construction of Belarusian NPP” (BY3.01/13 BE/RA/08), as well as regional project of European Commission “Education and internship” (“T&T”).

### 3.6 Safety assessment of Belarusian NPP

Assessment of Belarusian NPP safety shall run on the following directions:

control over fulfillment by RUE “Belarusian NPP” of the requirements formed at the stages of licensing of arrangement and construction of units No.1 and No.2 of Belarusian NPP;

formation of Requirements of Gosatomnadzor to RUE “Belarusian NPP” during implementation of activity in the field of nuclear energy and ionizing radiation sources use in terms of nuclear facility construction (unit No.2 of Belarusian NPP);

performance of preparatory measures on safety assessment of nuclear facilities at the stage of license issuance for operation of units No.1 and No.2 of Belarusian NPP.

Within the framework of control over fulfillment by RUE “Belarusian NPP” of requirements formed at the stages of licensing of arrangement and construction of units No.1 and No.2 of Belarusian NPP by Gosatomnadzor:

developed is the regulatory document with requirements on performance of stress-tests (target safety reassessment) of Belarusian NPP with consideration of lessons of accident at “Fukushima-1” NPP. TCP “Assessment of frequency of severe damage of reactor core (for external initiating events of natural and man-caused origin)” which includes requirements on performance of stress-tests at Belarusian NPP, approved by the Resolution of the Ministry of Emergency Situations of the Republic of Belarus No.21 dated April 28, 2015;

analysis of implementation of plans on measures of RUE “Belarusian NPP” on compliance with the requirements formed at the stages of licensing of arrangement and construction of units No.1 and No.2 of Belarusian NPP within the framework of which database containing information on requirements of RUE “Belarusian NPP” was developed, on plans on measures of RUE “Belarusian NPP” on compliance with the given requirements and data on completion or extension of time periods of plans implementation of measures of RUE “Belarusian NPP”.

At the stage of license issuance for operation of units No.1 and No.2 of Belarusian NPP, preparatory measures on safety assessment of nuclear facilities shall be implemented on the following directions:

formation of approaches to performance of estimations and analysis of safety of Belarusian NPP with nuclear reactor VVER-1200 on the basis of software with consideration of the analysis of work practice of regulatory bodies of different countries on NPP safety assessment;

implementation of analysis and assessment of compliance of PSA-1 of Belarusian NPP with the requirements of regulatory legal acts including technical regulatory legal acts of the Republic of Belarus, Russian Federation and international recommendations.

### **3.7 Spent nuclear fuel and radioactive waste management**

Important part of nuclear and radiation safety assurance in the Republic of Belarus is establishment of reliable system of radioactive waste and spent nuclear fuel management conforming to the up-to-date world standards.

In the Republic of Belarus, radioactive waste are generated in industry, science, medicine and other branches of economy. Annually 3 tons of solid radioactive waste and up to 3 thousand of spent ionizing radiation sources arrive for storage.

The necessity of paying the most serious attention to safety assurance during management of radioactive facilities and spent nuclear fuel has risen multiply due to the made decisions on development of nuclear power industry in the country.

### **3.8 Radiation safety assurance at nuclear facilities**

At the current stage of supervisory activities performance for compliance with legislation in the field of radiation safety the following shall be performed:

- analysis of adopted technical and organizational solutions aimed at non-exceedance of doses to personnel and the public established by the legislation of the Republic of Belarus;

- consideration of radiation environmental monitoring programs in the sanitary protection zone and the surveillance zone of the Belarusian NPP;

- provision of control over the formation of databases upon the results of radiation surveys of the initial state of the environment ("zero background") in the location area of the Belarusian NPP;

- control over the implementation of Radiation Safety Programs during the construction of the Belarusian NPP.

### **3.9 Emergency preparedness and response**

In connection with the construction in the Republic of Belarus of the first nuclear power plant, there was designed and implemented Plan on improvement of the system of preparedness and response for nuclear or radiological accident, approved by A.N. Kalinin, the Deputy Prime Minister of the Republic of Belarus - the Chairman of the Emergency Commission at the Council of Ministers of the Republic of Belarus dated 01/10/2013. (hereinafter - the Plan).

Within the framework of the Plan realization, Gosatomnadzor developed the Draft Concept of situational crisis centers system for nuclear power industry. The Draft Concept envisages the creation of information-analytical center for the implementation of powers of Gosatomnadzor for the organization and operation of control systems for nuclear facilities in the event of accidents on them.

As part of the interdepartmental working group, the Gosatomnadzor specialists shall participate in the development of the external emergency plan.

### **3.10 Current state and prospects of the technical support system development**

In 2012 (by the Decision of the Council of Ministers of the Republic of Belarus No.33 (2012) [26].) the State Scientific Institution "Joint Institute for Power and Nuclear Research - Sosny" of the National Academy of Sciences of Belarus was determined as the organization providing scientific and technical support to the Ministry of Emergency Situations, performing in accordance with the legislative acts of the organization and

execution of works on the scientific and technical support of nuclear and radiation safety regulation, including the analysis and justification of criteria and requirements of such safety, performance of research works to improve the efficiency of the state regulation in the field of nuclear and radiation safety of nuclear facilities, as well as performance of safety assessment in the field of nuclear power and ionizing radiation sources use. On 25 November 2011, SSI "JIPNR-Sosny" received a license of Gosatomnadzor for performance of safety expertise in the field of nuclear power and ionizing radiation sources use.

Following the implementation of the nuclear program, there arose a demand in a number of competencies that SSI "JIPNR-Sosny" currently do not have (for example, safety expertise during welding operations, building structures, buildings, structures, strength calculations of structures and systems during non-destructive testing etc.).

The solution of issue of missing competencies of technical support is seen in the establishment of TSO system among research institutes (centers), educational institutions, design organizations, engineering departments of enterprises able to carry out the examination of nuclear and radiation safety, as well as to provide technical and advisory support to the regulatory body for the period not less than 60 years, due to the need for periodic expert assessment of safety at all stages of the nuclear power plant life cycle (designing, construction, commissioning, operation, decommissioning).

### **3.11 International cooperation**

#### *Execution of international commitments*

Gosatomnadzor as the Department of a state administration body authorized to fulfill the commitments under the international agreements and conventions in the field of nuclear and radiation safety, shall ensure preparation and defense of national reports of the Republic of Belarus within the framework of:

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (there was ensured defense of the 5-th National Report of the Republic of Belarus on the implementation of the Joint Convention (May 2015), the defense of the next National Report shall be held in 2018);

Convention on Nuclear Safety (there was received notification on procedural matters concerning the preparation and presentation of the next (seventh) National Report of the Republic of Belarus, the protection of which shall be held in 2017).

Gosatomnadzor shall be involved in the implementation of commitments under the Agreement between the Republic of Belarus and the IAEA on the Application of Safeguards in Connection with the Treaty on Non-Proliferation of Nuclear Weapons: there shall be sent the required documents to the Agency with the description of a nuclear facility, and IAEA inspectors shall perform in accordance with the established procedure control measures in the SSI "JIPNR-Sosny", RUE "Belarusian nuclear power plant".

#### *Cooperation with the IAEA*

Under the current project "Improvement of professional level of the regulatory body on nuclear and radiation safety" (BYE9020) there were performed seminars and organized internships. In particular:

seminars for personnel of Gosatomnadzor and other interested professionals on the following issues: self-assessment using a software of SARIS (Minsk, March 2015), quality assurance, safety culture and leadership (Minsk, March-April 2015); equipment manufacturing supervision (Minsk, July 2015);

training of specialist from Gosatomnadzor (Hungary, September 2015 on the equipment acceptance for NPP);

participated as an observer during conduction of the IAEA mission on a comprehensive assessment of the regulatory infrastructure (IRRS mission) in Hungary, 11-15 of May 2015;

shall be prepared national project for the next project cycle 2016-2017.

Gosatomnadzor shall provide preparation for the 2016 IAEA mission on comprehensive assessment of regulatory infrastructure (IRRS) and other missions (list is attached).

### *Cooperation with the European Union*

Within the framework of cooperation of the Republic of Belarus with the European Union on issues of nuclear and radiation safety, which is carried out since 1998 within the framework of the Instrument for cooperation in the field of nuclear safety in the Republic of Belarus, there were implemented six projects on international technical assistance of the European Commission. Gosatomnadzor shall provide the implementation of two projects:

"Development of technical cooperation in the field of nuclear safety with regard to support of regulatory authorities", BY3.01 / 09 (2014-2016);

"Support and assistance in strengthening the capacity of the Belarusian Nuclear Regulatory Authority MES / Gosatomnadzor in licensing and supervision of the construction of the Belarusian nuclear power plant (NPP)", BY3.01 / 13 (2015-2017).

Project activities shall be aimed at providing consulting assistance to the Belarusian regulatory body on issues of licensing, supervisory activities, radioactive waste management, emergency response, regulatory documents developments in the field of nuclear and radiation safety. There was formed application for the next project cycle 2017-2020.

Gosatomnadzor specialists take part in the implementation of regional projects of the European Commission, aimed at training in various fields within the framework of safety provision in the nuclear power industry (the project "Tutoring and training" (T & T)).

### *Bilateral cooperation*

Within the framework of the bilateral cooperation, Gosatomnadzor shall provide implementation of existing bilateral agreements in the field of nuclear and radiation safety with regulatory bodies and their technical support organizations of Austria, Armenia, Germany, Poland, Russia, France, Ukraine. There shall be prepared for signing bilateral agreements on nuclear and radiation safety with Hungary, Lithuania, northern European countries (Norway, Finland, Sweden).

### *Multilateral cooperation*

There shall be continued cooperation in the framework of the Regulators Cooperation Forum (RCF) and the implementation of the RCF Work Plan for the Republic of Belarus. In 2015, the Republic of Belarus received an observer status in the Association of nuclear safety regulators in Western Europe (WENRA) and the Forum of Regulators, operating pressurized water reactors (WWER Forum). Gosatomnadzor shall delegate its representatives to the working groups of WENRA and WWER.

Gosatomnadzor shall continue identification of existing international organizations and associations of regulatory bodies, as well as analysis of the possible directions of development of mutually beneficial bilateral cooperation in the field of nuclear and radiation safety.

### **3.12 Informational activities**

In accordance with its responsibilities, Gosatomnadzor shall inform concerned parties about the state of safety of radiation facilities, nuclear facilities, nuclear power facilities and other issues related to nuclear and radiation safety and regulation in this sphere.

This activity shall be based on information and communications strategy of Gosatomnadzor approved at the Department board meeting dated November 18, 2013, of semi-annual and quarterly planning. The aforementioned Strategy contains and as for today shall solve the following basic tasks.

Comprehensive (topical) task shall be the following:

- achievement of a sustainable awareness by various target audiences of the Ministry of Emergency Situations of the Republic of Belarus as an authorized state administrative body - the regulator in the field of nuclear and radiation safety, Gosatomnadzor - as the Department of the Ministry of Emergency Situations of the Republic of Belarus, to which delegated powers of the state supervision in the field of nuclear and radiation safety and control of relevant legislation implementation;

- strengthening confidence in the state regulation of nuclear and radiation safety in the Republic of Belarus as a whole, as well as Gosatomnadzor, on the basis of a public demonstration of practical actions of the latter to implement the powers granted to it in terms of state supervision in the field of nuclear and radiation safety and implementation control of the relevant legislation;

- formation of adequate representation in domestic and foreign audience (professionals and the public) on nuclear and radiation safety assurance in the Republic of Belarus, the modern world tendencies in assurance of nuclear and radiation safety;

- development of a pervasive safety culture as an essential professional attribute in the nuclear field.

Infrastructural (organizational and technological) issues:



organization of constructive cooperation and assurance of interdepartmental cooperation of Gosatomnadzor with other governmental bodies, organizations of the Republic of Belarus to increase the efficiency of the state system of nuclear and radiation safety of the agreed information policy in this field;

organization of interaction of Gosatomnadzor with foreign regulators in the field of nuclear and radiation safety, international organizations on the basis of modern technology;

development and improvement of skills in informational work and communication culture of Gosatomnadzor specialists;

formation with participation of interested governmental bodies and organizations of national information space in the Internet on nuclear and radiation safety issues;

development of information potential and communicational infrastructure of Gosatomnadzor on a modern technological basis (information products, internal and external information resources and systems, communication channels etc.).

In order to plan activity for their implementation, there was developed a map of the stage-by-stage implementation of the information and communication strategy for Gosatomnadzor, in which recorded the measures aimed at solving the above mentioned issues, the target audience and the expected effect.

#### **4. Strategic areas for improvement of Gosatomnadzor**

In view of the above-mentioned external and internal conditions of Gosatomnadzor activities at this stage of development the following areas have been identified:

1. Improvement of the legal and regulatory basis;
2. Improvement of the infrastructure of nuclear safety, including:
  - licensing process (commissioning and operation) of new nuclear power units;
  - organization of the expertise and assessment of safety;
  - supervision of construction, commissioning and operation of the Belarusian NPP;
  - intensification of activities for supervision of manufacturing, acceptance and installation of equipment;
  - creation of an effective system of technical support organizations for the regulatory body within a short time.
3. Improvement of the inner infrastructure of Gosatomnadzor, including:
  - improvement of the organizational structure;
  - intensification of personnel structure formation, development of human potential under the condition of combining the processes of performance of their duties and training;
  - formation of a system for keeping and transfer of knowledge;
  - development and implementation of an integrated management system for Gosatomnadzor.

4. Development of a mechanism to support decision-making in case of nuclear and radiation accidents;
5. Preparation of the requirements for radioactive waste and spent fuel management;
6. Informational work improvement;
7. Preparation and realization of the IAEA mission for Integrated Regulatory Review Service (IRRS).

Activities for directions of strategic development shall provide the following.

#### **4.1 Further improvement of the regulatory framework**

Gosatomnadzor shall continue development and improvement of legislative and regulatory documents in view of modern principles of safety, criteria and requirements. Areas of work shall include the following:

- development of regulatory infrastructure of nuclear and radiation safety in Belarus;
- development of the supervisory process within the scope of NPP construction;
- periodic safety review of the existing nuclear facilities and nuclear materials storage conditions;
- long-term safety assessment of radioactive waste storage facilities;
- implementation of risk-informed approaches;
- provision of measures for application of technical regulatory documents;
- regulation of physical protection of nuclear installations, nuclear materials, radioactive waste and radioactive sources.

Instruments for performed improvement shall be the Plan for development / revision of regulatory legal acts in the field of nuclear and radiation safety of Gosatomnadzor, as well as the schedule of preparation of legal acts in the field of nuclear and radiation safety for 2016-2020, formed by Gosatomnadzor under the State program "Scientific support of nuclear power development in the Republic of Belarus for 2009-2010 and for the period until 2020".

#### **4.2 Improvement of the infrastructure for nuclear safety assurance**

##### **4.2.1 The process of licensing of new nuclear power units (preparation of the licensing plan)**

Within the framework of the licensing activities performance during construction and commissioning of the Belarusian NPP Gosatomnadzor shall perform the following:

- continuous control of the implementation of terms of issued licenses by the licensee before the full implementation of the license terms;

consideration of an application for a license for Belarusian NPP operation, including the organization of the safety assessment;

development of stage-by-stage plan for the commissioning licensing (start-up, physical start, reactor power startup and trial operation) of the Belarusian NPP;

preparation for the process of issuance and direct issuance of permits for Belarusian NPP personnel.

#### **4.2.2 Organization of the expertise and safety assessment**

In order to improve the organization of the expertise and safety assessment, Gosatomnadzor shall perform the following:

intensify efforts on improvement of the existing legislation with a view of renovation of the existing requirements for the expertise and safety assessment, as well as enhancement of possibility of attracting all the existing scientific and engineering capacities in the Republic of Belarus to perform these tasks;

develop approaches for the formation and to form a register of experts upon separate directions of safety expertise;

within the established system of technical support organizations to identify and attract the needed scope of experts to perform a comprehensive review and independent verification (expertise) of the final safety analysis report in a preliminary version for the preparation of the decision to issue a license for operation of the Belarusian NPP.

#### **4.2.3 Supervision over construction, commissioning and operation of the Belarusian NPP**

Gosatomnadzor by performing works for the improvement of supervising activities shall provide the following:

the preparation of the regulatory document on the procedure of state supervision over compliance with legislation in the field of nuclear and radiation safety during performance of activities for the use of nuclear power and the instructions on the procedure of performance and presentation of the results of inspections in a constant control (supervision) basis;

elaboration of a strategic plan for development of supervising activities prior to the stages of commissioning and operation of the Belarusian NPP;

determination of the criteria for comprehensiveness and priority of supervisory activities in the framework of performed inspections;

implementation of the concept of development of an internal information system for supervisory activities performance.

#### **4.2.4 Intensification of activities for supervision of manufacturing, acceptance and installation of equipment**

Taking into account the increased number of supplied equipment during the construction of the Belarusian NPP Gosatomnadzor shall perform the following:

optimization of the existing human resources and the admission of new employees, bringing together in one department the experts assessing quality and safety of equipment and systems, both in the process of supervision of the acceptance and installation, as well as in the framework of inspections at the manufacturing plants, including the use of risk-informed approaches;

expansion of the practice of attracting foreign specialists and experts, including from the Russian Federation, under the terms of the paid services on the acceptance of the equipment in the period of intensive supply of equipment in 2016 - 2017.

#### **4.2.5 Creation of an effective system of technical support organizations for the regulatory body within a short time**

To create an effective, independent and competent organizational and technical infrastructure on provision of technical support for the regulatory body here shall be performed the following:

development of networking cooperation of organizations that have the necessary competence to provide technical support to the regulatory body and its institutionalization;

involvement of organizations participated in the provision of technical support into international projects and the association for the development of the system of technical support organizations, including participation in the open European Network of Technical Support Organizations (ETSON);

improvement and further development of the legal framework in terms of the main requirements for the organization of technical support, and procedures for the accreditation of expert organizations and individual experts;

formation of internal personnel resources of Gosatomnadzor for organization and maintenance of procedures for obtainment of scientific and technical support by the regulatory bodies on safety issues.

### **4.3 Improvement of inner infrastructure of Gosatomnadzor**

#### **4.3.1 Improvement of the organizational structure**

As part of the preparation for the licensing of commissioning of the first unit of the Belarusian NPP in accordance with international standards Gosatomnadzor will improve the organizational structure, the result of which shall be the following:

formation of a single department, performing supervising functions to assessment and analysis of the safety of systems and equipment of nuclear installations;

optimization of the department on supervision over nuclear and radiation safety at the NPP site, providing a constant regime (daily) of supervision;

reorganization of administrative activities in order to improve the safety of information resources of the department;

formation of an internal resource to optimize works for organization and maintenance of scientific and technical support of Gosatomnadzor;

establishment of a center that provides an effective participation of Gosatomnadzor in the system of emergency preparedness and response;

enhancement of potential for organization of international cooperation due to the extension of international cooperation (participation in forums WWER, WENRA, RCF, preparation and conclusion of new bilateral agreements, in particular with Hungary, northern countries).

#### **4.3.2 Intensification of formation of personnel structure, development of personnel potential**

Individualized approach will be implemented for the development of professional competencies of employees with involvement of necessary funds, international experience and application of best practices on the basis of long-term qualification improvement, internships and training. All available mechanisms to increase motivation (material and non-material) to encourage involvement in the process, and employee satisfaction with the results of their work will be used.

#### **4.3.3 Formation of the system of keeping and transfer of knowledge**

Through mentoring, information and communication technologies, will be created an internal infrastructure allowing distribution and realization of the accumulated experience in the organization and relevant information through the management, keeping and exchange of knowledge for the improvement of activities in the field of nuclear and radiation safety. For this purpose, it will be prepared and implemented knowledge management strategy of Gosatomnadzor. The strategy will include knowledge management processes and common approaches for its implementation, the policy in the field of training, the formalization of a systematic approach to training, technical solutions for the implementation of knowledge management processes.

#### **4.3.4 Development and implementation of an integrated management system of Gosatomnadzor**

In accordance with the IAEA documents: GSR PART 1 "Governmental, legal and regulatory framework for safety assurance", GS-R-3, "Management system for facilities and activities", GS-G-3.1 «Application of management system for facilities and activities" and by formalizing processes in Gosatomnadzor there will be built and

implemented an integrated management system that integrates all aspects of regulatory activities so that safety requirements are to be of paramount priority.

#### **4.4 Establishment of a mechanism for support of decision-making in case of nuclear and radiation accidents**

In accordance with the concept of establishment of a system of situational crisis centers in the Republic of Belarus and bases on the experience obtained in the framework of international technical cooperation projects, the Information and Analytical Centre (Gosatomnadzor IAC) will be created within Gosatomnadzor structure - situational center for support of decision making on nuclear and radiation safety issues of the Ministry of Emergency Situations, which provides an effective participation of Gosatomnadzor in the system of emergency preparedness and response, as well as defining the role of Gosatomnadzor in supporting of decision-making on issues of nuclear and radiation safety.

#### **4.5 Preparation of requirements for radioactive waste and spent fuel management**

In order to improve activities in the field of radioactive waste and spent fuel management, Gosatomnadzor will continue interaction with interested state administrative bodies for development of a strategy for radioactive waste management of the Republic of Belarus and the strategy for spent fuel management of the Republic of Belarus. Control over the implementation of strategy for radioactive waste management of Belarusian NPP will be continued, including the control of the creation of RW disposal point to ensure the safe storage of RW.

#### **4.6 Informational work improvement**

Within the scope of performed information works, Gosatomnadzor will continue to:

- prepare annual reviews of the status of nuclear and radiation safety in the Republic of Belarus;

- develop methodologies and training of journalists covering the issues of nuclear and radiation safety in the Republic of Belarus;

- prepare for performance by the governmental body of a public debate prior to the issuance of licenses for the operation of the Belarusian NPP;

- develop assessment approaches for effective implementation of information-communication strategy of Gosatomnadzor and its revision in a view of the two-year implementation experience.

#### **4.7 Preparation and carrying out of the IAEA mission for the regulatory infrastructure assessment (IRRS)**

There will be realized preparation, carrying out of the IAEA mission for the regulatory infrastructure assessment (IRRS) and the implementation of the mission recommendations for further improvement of the state regulation of safety assurance.

Within the framework of preparation there will be held a preparatory meeting for IRRS mission performance and self assessment of existing infrastructure will be executed on the basis of SARRIS software product.

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