

INOFFICIAL

**THE THIRD NATIONAL REPORT
OF THE RUSSIAN FEDERATION**

**ON COMPLIANCE WITH THE OBLIGATIONS
OF THE JOINT CONVENTION ON THE SAFETY
OF SPENT FUEL MANAGEMENT AND THE SAFETY
OF RADIOACTIVE WASTE MANAGEMENT**

Prepared for the fourth Review Meeting
in frames of the Joint Convention on
the Safety of Spent Fuel Management
and the Safety of Radioactive Waste
Management

Moscow 2012

This Third National Report of the Russian Federation has been drafted in accordance with Article 32 of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management.

The Report describes in detail the obligations concerning the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management and compliance with them by the Russian Federation.

The Report has been prepared by the State Atomic Energy Corporation «Rosatom» (Rosatom) and the Federal Environmental, Industrial and Nuclear Supervision Service (Rostekhnadzor) with involvement of:

- Institution of the Russian Academy of Sciences Nuclear Safety Institute of the Russian Academy of Sciences (IBRAE RAS);
- Federal budgetary institution «Scientific and Engineering Center for Nuclear and Radiation Safety» (FBI «SEC NRS»).

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List of Abbreviations

- AECC — Open-type Joint Stock Company Angarsk Electrolysis Chemical Combine (JSC AECC)
- AMB — «Atomic peaceful large» (an abbreviation for water-cooled, graphite-moderated channel-type thermal neutron reactor)
- BN — Fast neutron reactor
- CA — Controlled Area
- CHMP — Open-type Joint Stock Company Chemical and Metallurgical Plant (JSC CHMP)
- CMP — Open-type Joint Stock Company Chepetsky Mechanical Plant (JSC CMP)
- EGP — Loop-type graphite power reactor
- FA — Fuel Assembly
- FL — Federal Law
- FMBA — Federal Medical Biological Agency
- FMB — Floating Maintenance Base
- FR — Fuel Rod
- FSUE — Federal State Unitary Enterprise
- FTP — Federal Target Program
- GSP NCF — General Safety Provisions for Nuclear Fuel Cycle Facilities
- HLW — High Level Waste
- HMP — Open-type Joint Stock Company Hydrometallurgical Plant
- IAEA — International Atomic Energy Agency
- ICRP — International Commission for Radiation Protection
- ILW — Intermediate Level Waste
- IPPE — Federal State Unitary Enterprise the State Scientific Center of Russian Federation — the Institute of Physics and Power Engineering named after A.I. Leipunsky (FSUE SRC RF IPPE)
- IR — Ionizing Radiation
- IRS — Ionizing Radiation Source
- KMP — Open-type Joint Stock Company Kovrov Mechanical Plant (JSC KMP)
- LLW — Low Level Waste
- LRW — Liquid Radioactive Waste

- MCC — Federal State Unitary Enterprise Mining and Chemical Combine (FSUE MCC)
- MMC — Open-type Joint Stock Company Murmansk Shipping Company
- MOE — Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Natural Disaster Consequences
- MSZ — Open-type Joint Stock Company Machine-Building Plant (JSC MSZ)
- NCCP — Open Joint Stock Company Novosibirsk Chemical Concentrates Combine (JSC NPCC)
- NFC — Nuclear Fuel Cycle
- NIIP — Federal State Unitary Enterprise Scientific Research Institute for Instruments (FSUE NIIP)
- NFM (S) — Nuclear fissile materials (substances)
- RIAR — Open-type Joint Stock Company the State Research Center of the Russian Federation – Research Institute of Atomic Reactors (JSC SRC Russian Federation RIAR or RIAR)
- NM — Nuclear Materials
- NP — Norms and rules
- NPI — Nuclear Power Facility
- NPIC — Nuclear Power and Industry Complex
- NPP — Nuclear Power Plant
- NRS — Nuclear Radiation Safety
- OJSC — Open-type Joint Stock Company
- OSPORB — Basic sanitary rules of radiation safety
- PA Mayak — Federal State Unitary Enterprise Production Association Mayak (FSUE PA Mayak)
- PIMCU — Open-type Joint Stock Company Priargunsky Industrial Mining and Chemical Union
- RBMK — Uranium-graphite large capacity channel-type reactor
- RD — Guiding document
- RF — Russian Federation
- Rosatom — State Atomic Energy Corporation «Rosatom»
- Rostechnadzor — Federal Environmental, Industrial and nuclear Supervision Service of Russia
- RR — Research Reactor
- RS — Radiation Source

- RSS — Radiation Safety Standards
- RTG — Radioisotope Thermoelectric Generator
- RW — Radioactive Waste
- SAR — Safety Analysis Report
- SC Radon — Special Combine Radon
- SCC — Open-type Joint Stock Company Siberian Chemical Combine (JSC SCC)
- SCR — Self-sustained Chain Reaction
- SEF — Special Environmental Program
- SF — Storage Facility
- SFA — Spent* Fuel Assembly
- SNF — Spent* Nuclear Fuel
- SRS — Sealed Radiation Source
- SRW — Solid Radioactive Waste
- TUK — Transportation package
- UECC — Open-type Joint Stock Company Ural Electrochemical Combine (JSC UECC)
- USS — Unified State System
- WHO — World Health Organization
- WWER — Water-cooled water-moderated power reactor

* termed «irradiated» in a number of regulations of the Russian Federation

Section A. Introduction

A.1. Purpose of the Report

The present Third National Report of Russian Federation on compliance with the obligations of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereinafter Convention) covers the period from January 2009 to July 2011.

The purpose of the National Report – informing on compliance with the obligations of safety of RW and SNF management, assumed by Russian Federation according to the Convention.

The National Report is focused on issues and problems highlighted by the Contracting Parties in the course of the review and discussion of national reports at the Third Review Meeting held in the IAEA (Vienna, Austria) on May 11-20, 2009.

The Third National Report does not include some issues of compliance with articles of the Convention which were described in details in the Second National Report of Russian Federation and have not been changed over the period reported.

A.2. Structure of the Report

The report has been prepared in accordance with requirements of the «Guidelines regarding the form and structure of national Reports» (INFCIRC/604/rev.1) of the Convention.

The sections of Report listed below describe article-by-article how the obligations of Russian Federation under the Convention are complied with.

Section	Title of Section	Article of the Convention
A	Introduction	
B	Policies and Practices	32.1
C	Scope of Application	3
D	Inventories and Lists	32.2
E	Legislative and Regulatory System	18-20
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A.3. Conclusions Made After Review of the Second National Report of Russian Federation at the Third Review Meeting

On the Third Review Meeting of the Contracting Parties for the review of the national reports were noted the positive aspects of SNF and RW management practices existing in the Russian Federation, including:

- the compliance of the existing legal and regulatory basis in the field of SNF and RW management as well as of the State regulatory system in the field of use of atomic energy with the international recommendations;
- the beginning of realization of the Federal Target Program «Nuclear and Radiation Safety in 2008 and until 2015» (hereinafter FTP «Nuclear and Radiation Safety»), the main purpose of which is the complex solution of issues in the field of nuclear and radiation safety, associated with the management of SNF and RW, decommissioning of nuclear and radiation hazardous facilities, with the improvement of systems, necessary to ensure and control nuclear and radiation safety;
- preparation of the draft Federal Law «On the Radioactive Waste Management and on the Changes in Some Legislative Acts of Russian Federation», which defines the legal and economical mechanisms, that provide the base for activity in the field of management of «historical» and newly formed radioactive waste;
- functioning of the system for State accounting and control of radioactive substances and radioactive waste;
- systematic and periodical analysis of the safety status of facilities designed for SNF and RW management;
- international cooperation on return of the SNF of foreign research reactors built to Russian Designs;
- Wide use in the current practice of the RW reprocessing facilities and design of the new facilities.

The specific factor determining the policy and practices of SNF and RW management in the Russian Federation is the presence of a significant amount of SNF and RW resulted from the past national defense programs, as well as the «storage facilities» of liquid and solid low-level and intermediate-level radioactive wastes within the boundaries of some industrial enterprises, which don't correspond to the modern requirements to ensure safety, as well as the controlled pumping of liquid low-level and intermediate-level radioactive waste into deep geological formations.

During the discussion it was particularly noted that Russian Federation needs to solve the difficult tasks concerning the problems of the nuclear legacy (conservation of the industrial reservoir «Karachay», achievement of the safe status of Techa cascade of reservoirs, the formation of the system of interregional sites for RW disposal, formation of the SNF management system, elaboration of RW classification according to the disposal method and some others.)

At the same time it was stressed that in Russian Federation had been started the work to create system approaches to the RW and SNF management. It was noted that the Rosatom's Long-term Activity Program (2009-2015) had been approved, one of its directions is «to provide the safe operation of the objects of use of atomic energy and implementation of the norms of nuclear and radiation safety», the draft of the Federal Law «On radioactive waste management » has been elaborated, selection of the site for the disposal of RW in the deep

geological formations is under process, Russian Federation actively takes part in the international activity to elaborate the multilateral approaches to provide safety of the nuclear fuel cycle (NFC).

According to the results of the discussion of the Second National Report has been underlined the necessity to realize the planned measurements, enhancing safety level while performing the RW and SNF management activities, including:

- Creation of the Unified State System for RW management;
- Construction of a dry SNF storage at the FSUE «Mining and Chemical Combine» (MCC);
- Elaboration of the draft Federal Law «On Spent Nuclear Fuel Management»;
- Termination of the importation of the main amount of high enriched SNF from the foreign research reactors according to the Global initiative of threat reduction.

Planned and implemented measurements for enhancement of safety by the management of SNF and RW, whose necessity has been noted in the conclusions during the review of the Second National Report of Russian Federation on compliance with the obligations of the Joint Convention on the Safety of Spent Fuel Management and Safety of Radioactive Waste Management are described in this Report sections A.4.3, B.2.3, B.2.6, B.5, D.1.4, D.3, E.2.1.1, F.2.2, F.5, F.6, G.1.2, G.1.3, G.1.4, G.7, H.1.2, H.1.3, H.1.7, I, K.

A.4. Main Topics of the Report and Near-Term Initiatives to Ensure Safety of SNF and RW Management

A.4.1. National Policies of Russian Federation in Nuclear Power Development and Nuclear and Radiation Safety

Russia's energy development long-term plans, defined by the «Energy Strategy Of Russia until 2030» (approved by directive of Government of the Russian Federation № 1715 of 13.11. 2009), envisage the outrunning growth and increase of the nuclear share in the total amount of energy generation.

The national policy of the Russian Federation to provide nuclear and radiation safety is determined by the «Basics of the State policy to ensure the nuclear and radiation safety of Russian Federation up to 2010 and beyond» (hereinafter «Basics of State policy»).

The aim of the State policy is the gradual reduction down to the acceptable level of man-induced impact on the population and environment by the use of atomic energy.

For the reliable provision of nuclear and radiation safety Russian Federation adopted FTP «Nuclear and Radiation Safety» (Ordinance № 244 of the Government of Russian Federation of 13.08.2007).

A.4.2. Organizational and Legal Changes in Nuclear Industry and in the Field of Regulation of Safety of the Uses of Atomic Energy

The Government and the President of the Russian Federation have adopted a series of new normative legal Acts, according to which the regulating functions have been redistributed between federal executive authorities.

The changes have concerned the system and the structure of Federal executive authorities, implementing the State regulation of safety by the use of atomic energy. By the decree of the President of the Russian Federation № 780 «Issues of the Federal environmental, industrial and nuclear supervision service» of 23.06.2010 the Federal environmental, industrial

and nuclear supervision Service (Rostekhnadzor) has been subordinated from the jurisdiction of Ministry of natural resources and ecology directly under the jurisdiction of the Russian Federation government. Competences of Rostekhnadzor in the field of State ecological expert examination has been assigned to Federal service on supervision in sphere of wildlife management (Rosprirodnadzor).

The Ordinance of Government of Russian Federation № 717 entitled «On the Changes of Some Ordinances of Government of Russian Federation Regarding the Competences of Ministry of Natural Resources and Environment of Russian Federation, Federal Service on Supervision in Sphere of Wildlife Management and Federal Service of Ecological, Technological and Nuclear Supervision» of 13.09.2010 has defined that Rostekhnadzor is an authority of State regulation of safety by the use of atomic energy, as well as the regulating authority according to the Convention on the nuclear safety and the Joint Convention on the safety of SNF management and safety of RW management. Furthermore, to Rostekhnadzor have been assigned the functions to grant the permissions for releases and discharges of the radioactive substances, as well as to set the procedure of the establishment of the normative standards of the maximum permissible releases and discharges of radioactive substances into the environment.

The Ordinance of Government of Russian Federation № 78 of 15.02.2011 «On the Changes of Some Ordinances of Government of Russian Federation Regarding the Competences of Ministry of Natural Resources and Environment of Russian Federation, Federal Service on Supervision in Sphere of Wildlife Management and Federal service of Ecological, Technological and Nuclear Supervision» defines that Rosprirodnadzor is the authority of State regulation of safety by the use of atomic energy.

A.4.3. Near-Term Initiatives in Enhancing Safety of SNF and RW Management

The most important initiatives to ensure safety in the area of the SNF and RW management will be in the nearest future aimed to achieve creation development of the legal framework.

On July 15, 2011 the Federal Law № 190-FL of 11.07.2011 «On the Radioactive Waste Management and on the Changes in Some Legislative Acts of Russian Federation» came into force. This law envisages the elaboration and implementation of a series of normative documents of the Government of Russian Federation, authorities of the State safety regulation by the RW management, authorities of the State administration of RW management, intending to create the Uniform State System for Radioactive Waste Management (USS RW). The terms of creation of USS RW are set by the Government of Russian Federation.

Section B. Policies and Practices (Article 32)

Article 32. Presentation of reports

1. According to the provisions of article 30 each Contracting Part presents a national report to each review meeting of Contracting Parts. In this report are reviewed the measures, assumed to fulfill every obligation fixed in the Convention. The report of each Contracting Part presents also its:

- I) policy in the field of SNF management;
- II) practices of SNF management;
- III) policy in the field of RW management;
- IV) practices of RW management;
- V) criteria used for definition and classification of radioactive wastes.

B.1. SNF Management Policy

Policy of the Russian Federation in the field of SNF management is based on the concept that is founded on the principal that SNF is not a radioactive waste.

Management of SNF in Russia is carried out according to the «Concept of Management of Spent Nuclear Fuel» of the State Atomic Energy Corporation «Rosatom», approved by the decree № 721 of 29.12.2008.

The priority tasks of the management of accumulated SNF are reflected in the FTP «Nuclear and Radiation Safety».

In the heart of the State policy of the Russian Federation in the field of SNF management is a principle of its reprocessing for to ensure ecologically allowable handling of fission products and redirection of the regenerated nuclear materials into the nuclear fuel cycle.

B.2. SNF Management Practices

Russian national practices in the field of SNF management at present time combines the controlled storage and reprocessing of SNF and envisages the solution of the priority tasks to ensure safety by the SNF management within the framework of the FTP «Nuclear and Radiation Safety».

Below is represented the main information about the existing facilities and about the amounts of SNF at various enterprises of the Russian Federation.

Inventories and lists of SNF are shown in Section D.

B.2.1. Spent Nuclear Fuel of NPPs

As of 01.01.2011, Russia operates 32 nuclear power units with the overall installed capacity of 24,242 MW. The Annex B1 shows data on the current status and projection of SNF accumulation on various types of reactors.

At present, depending on the back-end of nuclear fuel cycle (NFC), SNF is stored at NPPs as follows:

- for SNF of reactors WWER-440 and BN-600 the interim storage is arranged in the at-reactor cooling ponds and then shipped off from the NPP site to the reprocessing facility;
- SNF of reactors WWER-1000, RBMK-1000, EGP-6 и AMB, which is not subject to reprocessing, is located in at-reactor special storage facilities or in the centralized storage facility of the MCC.

At the sites of NPPs SNF is located in the at-reactor cooling ponds, as well as in the cooling ponds of separate specialized storage facilities. Leaky SFAs are stored in the separated shrouds of the cooling ponds.

B.2.1.1. SNF of WWER-440 Reactors

Russia operates 6 units with WWER-440 type reactors, which produce 55,5 tons (metallic uranium) of SNF annually. After the cooling in the at-reactor cooling ponds during 3 and more years the WWER-440 SNF is shipped to RT-1 at PA Mayak for reprocessing.

B.2.1.2. SNF of WWER-1000 Reactors

Russia operates 10 power units of WWER-1000 type reactors, which produce approximately 200 tons of SNF annually. WWER-1000 SNF currently is not reprocessed. After the cooling during 3 and more years SNF is shipped from NPPs to the centralized storage facility at MCC. SNF of the 5-th power unit of Novovoronezh NPP is stored on-site.

B.2.1.3. SNF of RBMK Reactors

Presently, 11 RBMK-1000 type reactors are in operation. Annually they produced approximately 400 tons of SNF. SNF of reactors of RBMK type currently is not reprocessed. SFAs are stored at NPPs in water in the at-reactor cooling ponds, as well as in the separate SNF storage facilities. Today over than 12,500 tons of SNF are stored on NPP sites. The shipment to the dry storage facility at MCC will be carried out after the construction of cutting units for RBMK SFA on the NPP's sites.

At the NPPs with the RBMK-1000 type reactors is executed the construction of cutting units for SFAs and erection of complexes for SNF container storage. The regular shipment of RBMK-1000 SNF for dry storage to the MCC is scheduled for 2012.

B.2.1.4. SNF of reactor of type BN-600 on Beloyarskaya NPP

Annually, the BN-600 reactor produces 6.2 tons of SNF, which after the cooling at NPP site is shipped to RT-1 for reprocessing.

B.2.1.5. SNF of reactors of type AMB on Beloyarskaya NPP

At Beloyarsk NPP the power units № 1 and № 2 of AMB type reactors were shut-down in 1981 and 1989 respectively. SNF has been unloaded from the reactors, partially removed from the NPP site and is stored in boxes in the wet storage facility at the PA Mayak, but the main part of the SNF is stored in the at-reactor cooling-down pools. In 2008 have been started the work to elaborate the design solutions for the further management of this kind of fuel.

B.2.1.6. SNF of reactors of type EGP-6 on Bilibinskaya NPP

Bilibino NPP consists of 4 similar power units with EGP-6 type reactors. SNF is stored in the cooling ponds of NPP.

B.2.2. SNF of Ship Nuclear Facilities (Marine Nuclear Propulsion Units) and Their Support Facilities

In Russia 6 icebreakers are operated — «Rossiya (*Russia*)» (1985), «Taimyr» (1988), «Sovetskiy Soyuz (*Soviet Union*)» (1989), «Vaigach» (1990), «Yamal» (1992), «50 Let Pobedy (*50 years of Victory*)» (2007) and 1 icebreaker lighter-aboard ship «Sevmoput» (1988). Icebreakers «Lenin» in 1989 and «Sibir (*Siberia*)» in 1992 have been decommissioned. Icebreaker «Arktika (*Arctic*)» is decommissioned since 2008.

Temporary storage of SNF from icebreakers is carried out on the floating service bases «Lotta» and «Imandra», on the accumulative site of FSUE «Atomflot», from where it is shipped to PA Mayak. A project has been elaborated, according to which it is planned to unload the SNF of icebreakers stored on the floating service base «Lepse» and to utilize «Lepse» itself.

In 2006 the container storage facility for the icebreakers' SNF has been put into operation. The icebreakers' SNF not subject to reprocessing at the PA Mayak will be unloaded from the storage facilities of the floating base «Lotta» and transported in the containers TUK-120 to the accumulative site of FSUE «Atomflot» for storage.

B.2.3. SNF of Research Reactors (RR)

In Russia 21 research reactors are operated, 1 is on refurbishment, 3 – mothballed, 11 – are decommissioned, 2 – are under construction.

SNF of research reactors operating within Russia was partly reprocessed at RT-1 of PA Mayak, and some types of SNF are stored in the interim storage facilities of the research reactors. Removal of this SNF from interim storage facilities for its reprocessing at the PA Mayak is carried out within the framework of FTP «Nuclear and Radiation Safety».

Highly enriched SNF of research reactors built to Russian (*Soviet*) designs returns in Russia for reprocessing. Return of nuclear fuel of research reactors from Uzbekistan (2005-2006), Czech Republic (2007), Latvia (2008), Bulgaria (2008-2009), Hungary (2008), Kazakhstan (2009), Romania (2009), Libya (2009), Poland (2009-2010), Belarus (2010), Ukraine (2010), Serbia (2010) to Russia has been completed.

B.2.4. SNF of Foreign Reactors

Outside Russia are (were) in operation NPPs with the reactors of WWER-1000 and WWER-440 types as well as research reactors which use nuclear fuel of Russian origin.

Part of irradiated fuel of research reactors has been already returned or will be returned back to the Russian Federation.

At present time the Russian Federation is engaged in the international cooperation with Bulgaria and Ukraine in order to provide services in the area of management of power reactors SNF.

Fuel from reactors of WWER-1000 type is shipped to storage facilities of MCC, and the fuel of WWER-440 type and research reactors is removed for reprocessing to PA Mayak.

B.2.5. SNF Reprocessing and Storage at the Enterprises

In the Russian Federation WWER-440, BN-600, reactors of nuclear vehicles propulsion units and research reactors' SNF is reprocessed at RT-1 of PA Mayak.

The works RT-1 operates since 1977, its design capacity is 400 tons of SNF per year. Two combines of the Rosatom - MCC and PA Mayak possess pool-type storage facilities for storage of SNF of Russian NPPs and of nuclear vehicles propulsion units with the capacity of 8 400 and 2 500 tons respectively.

The storage of spent fuel from WWER-1000 type reactors is carried out at MCC in the wet storage facility, put into operation in 1986.

Currently, a dry SNF storage facility is under construction at MCC.

FTP «Nuclear and Radiation Safety» pays great attention to the enhancement of the safety level of SNF management. The tasks of FTP «Nuclear and Radiation Safety» in the field of SNF management are the enhancement of capacities managing SNF at the objects of atomic energy use and introduction of innovative technologies.

At the first stage (2008-2010) were carried out the following main measures:

- Renovation of the wet storage facility for WWER-1000 SNF at MCC in order to enhance its capacity up to 8 600 tons;
- Construction of the SNF dry storage facility at MCC with the capacity able to cover actual requirements of nuclear industry;
- Creation of scientific and methodological basis and infrastructure elements of the systems of SNF and RW management;
- Provision of the safe management of SNF from AMB reactors.

At the second stage (2011-2015) it is planned to implement the following measures:

- Completion of the construction of dry SNF storage facility at MCC;
- Creation of Pilot demonstration centre (PDC) for reprocessing of SNF on base of innovative technologies at MCC (with the perspective to create on base of PDC the large-scale plant for SNF reprocessing);
- Removal of SNF accumulated in the at-reactor storage facilities to the MCC.

B.3. Criteria for Defining and Categorizing Radioactive Wastes

According to the Federal Law № 170-FL of 21.11.1995 «On the Use of Atomic Energy» RW are nuclear materials and radioactive substances which future use is not anticipated.

After the presentation of the Second National Report occurred some important changes concerning the RW classification and criteria used in definition and categorization of radioactive waste containing radionuclides or contaminated with radionuclides.

Up to the present time the criteria of waste categorization were set by the sanitary rules. On 17.09.2010 came into force new «Basic sanitary rules of radiation safety SP 2.6.1.2612-10» (further OSPORB -99/2010), approved by the order of the Main health officer of Russian Federation № 40 of 26.04.2010, according to which are introduced new criteria of the RW categorization.

According to the previously valid rules OSPORB-99, liquid waste included organic and inorganic liquids, pulps and tailings which are not more used with specific activity of radionuclides more than 10 times higher than the intervention levels, given in Annex P-2 of Radiation Safety Standards SP 2.6.1.758-99 (further - NRB-99).

Gaseous radioactive waste included gases and aerosols, formed during the manufacturing processes which future use is not anticipated with the volumetric activity exceeding the permissible volume activity (PVA), which values are indicated in the Annex P-2 of NRB-99.

Solid radioactive waste included spent radionuclide sources, as well as not subject to the further use materials, manufactured articles, equipment, biological objects, soil, and also solidified liquid radioactive waste, in which the specific activity of radionuclides is more than the values given in the Annex P-4 of NRB-99, and by the unknown radionuclide composition the specific activity is higher than:

- 100 kBq/kg — for beta-emitting radionuclides;
- 10 kBq/kg — for alpha-emitting radionuclides (excluding transuranic);
- 1,0 kBq/kg — for transuranic radionuclides.

In OSPORB -99/2010 the unified limits are defined for assignment of solid, liquid and gaseous materials to RW. Due to the fact that radioactive waste is regarded as not suitable to the further use substances, materials, mixtures and articles, in which the specific activity of man-induced radionuclides exceeds the minimal significant specific activity (further MSSA) (the sum of proportions of specific activity of man-induced radionuclides to MSSA exceeds 1). The values of MSSA are shown in the Annex 4 entitled «Radiation Safety Standards (further NRB-99/2009)» to the Sanitary rules and norms (SanPiN) 2.6.1.2523-09. They correspond to the values indicated in the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS-115, IAEA, 1996).

The classification of RW according to the specific activity has also undergone some changes. Some normative standards have been set forth for the categorization of the tritium containing wastes to the low-level, intermediate-level and high-level RW. The numerical values of criteria are given in the table B1.

Table B1. Specific activity of RW according to the categories of wastes

Wastes category	Specific activity, Bq/kg (Bq/l)			
	tritium	β -and γ -emitters	α -emitters (excluding transuranic)	transuranic elements
Low-level	from 10^6 to 10^7	less than 10^6	less than 10^5	less than 10^4
Intermediate-level	from 10^7 to 10^{11}	from 10^6 to 10^{10}	from 10^5 to 10^9	from 10^4 to 10^8
High-level	more than 10^{11}	more than 10^{10}	more than 10^9	more than 10^8

According to the changes in the classification of RW introduced by OSPORB-99/2010 have been changed and supplemented Sanitary rules for management of radioactive wastes SP 2.6.6.1168-02 (further - SPORO-2002).

The criteria used in definition and categorization of radioactive waste, introduced by OSPORB-99/2010 have not been practically implemented. According to the Rules of organization of the system for State accounting and control of radioactive substances and radioactive wastes, approved by the Ordinance of the Government of Russian Federation № 1298 of 11.10.1997 the criteria of the assignment to liquid radioactive wastes and gaseous radioactive wastes correspond to the values shown in the Annex P-2 of NRB-99. This report provides statistical data on radioactive waste as of 01.01.11

Federal Law «On the Radioactive Waste Management and on the Changes in Some Legislative Acts of the Russian Federation» has introduced the new classification of radioactive waste; at the same time the competences to define the criteria for radioactive waste classification are transmitted to the Government of the Russian Federation. The new criteria are used to define waste as radioactive waste and criteria of RW categorization will come into force by the Ordinance of the Government of the Russian Federation.

B.4. Radioactive Waste Management Policy

The provision of safe during of RW management activities is one of the important constituents of national safety of the State and is an obligatory condition for use of atomic energy at the present time and in future.

The most important stage of realization of the State policy of the Russian Federation in this field was the approval of the Federal Law «On the Radioactive Waste Management and on

the Changes in Some Legislative Acts of Russian Federation» (№ 190-FL of 11.07.2011). In this law is coherently realized principle of the prevention of negative radiation impact on the human being and the environment at all stages of RW management. According to the Law the Unified State System for RW management is being formed in the Russian Federation, the main goal of it is to organize and ensure safe and economically effective RW management. The Law sets forth the requirements to the RW disposal, requirements to the management of accumulated RW and to the sites of their storage, as well as sets the financial fundamentals to ensure activities in the field of RW management. The approval of the law fixed the transition from the practices of RW storage to the practices of their disposal, guaranteeing their reliable isolation during the whole period of their potential hazard.

Policy in the field of RW management will be carried out by the further development of normative and organizational frameworks for the system of RW management and by the creation of facilities for the disposal system.

B.5. Radioactive Waste Management Practices

At present in the Russian Federation the RW management practices are characterized by the following approaches.

As a rule, NPPs and large NFC enterprises implement all stages of RW collection, reprocessing and storage at their sites. In recent years the amounts of reprocessed high-level LRW exceed annually generated amounts, while these indicators for low-level LRW have nearly got equal. The main bulk of the accumulated high-level waste is a vitrified waste, fuel rod cladding, contaminated equipment, and spent RS (radioactive sources), which are held at PA Mayak, MCC and Siberian chemical combine (SCC). These wastes are located in specialized buildings or facilities and are isolated from the environment (Annex B2). There are three sites injection (deep storages) (MCC, SCC, RIAR) for disposal of liquid low-level and intermediate-level short-lived LRW into deep wells.

Until 2008 there has been a network of regional specialized enterprises «Radon» (earlier special combines), which received low- and intermediate-level RW from organizations which operated ionizing radiation sources (RS) and radioactive substances (RSb). The enterprises of the system «Radon» reprocessed RW and carried out their long-term storage. Some enterprises of nuclear fuel cycle (NFC) also transferred formed RW to enterprises of the system «Radon». By the decree of the President of the Russian Federation of 20.03.2008 the enterprises of the system «Radon» were subjected to the Rosatom (excluding FSUE MosNPO «Radon»). At present time they have been united into one State enterprise FSUE «Enterprise for management of radioactive wastes «RosRAO» (hereinafter FSUE «RosRAO»), which comprises as subsidiaries 14 special combines. Since 01.01.2011 Northern Federal enterprise for RW management (hereinafter FSUE «SevRAO») and Far Eastern Federal enterprise for RW management (hereinafter FSUE «DalRAO») merged with FSUE «RosRAO».

The RW reprocessing and conditioning is carried out at the following types of facilities: special water treatment (ion exchange, coagulation, deposition facilities) facilities, evaporation, inactivation, calcination, fractionation, cementation, bituminization, vitrification, compaction, melting, decontamination, incineration facilities and other types of facilities.

Further details on constructed, planned and existing facilities for RW management are given in section D; safety issues connected with RW management are given in section H.

For the coming years the main task is to reduce the share of stored waste which are non-isolated from the environment and to build new capacities for RW conditioning. The important work to ensure safety of RW management practices and decommissioning of nuclear and radiation hazardous objects is also carried out within the framework of the FTP «Nuclear and Radiation Safety».

In 2009-2010 continued the implementation of the following measures:

- Execution of urgent work to ensure safety of nuclear and radiation hazardous facilities, including facilities at the PA Mayak, MCC and Siberian chemical combine (SCC). In particular, the mothballing of the open pool-storage for liquid radioactive wastes (LRW) № 354 at the MCC, commissioning of Phase I of the combined waste water system, with the purified water drained to the left-bank canal of the Techa Cascade, have been carried out the work in order to create the complex for cementation of liquid and heterogeneous intermediate-level waste at PA Mayak, have been carried out work for conservation of underground capacities of the storage facilities for the radioactive pulps at MCC, have been carried out the work for conservation of pool B-1 at SCC;
- construction, refurbishment and expansion of RW management capacities at sites of the main enterprises of the State Corporation «Rosatom»;
- implementation of the priority work in order to found an underground laboratory for final isolation of high-level RW;
- establishment of scientific and methodological basis and infrastructure elements of systems for SNF and RW management, as well as for radiation monitoring systems and emergency response systems. As a pilot project at some enterprises of the State Corporation «Rosatom» have been elaborated the projects of local strategy for RW management, oriented to their adaptation to the requirements of the Unified State System for RW management that is currently under creation.
- Implementation of integrated engineering-radiation and radiation-hygienic inspections of the status of the shutdown nuclear facilities, storage facilities and other objects of nuclear legacy; pre-design and design works to render these objects into the condition that ensures long-term environmental safety.

For the realization of the final stage of RW management are carried out the pre-design and research work at the sites scheduled for location of RW disposal facilities.

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Until 2008 there has been a network of regional specialized enterprises «Radon» (earlier special combines), which received low- and intermediate-level RW from organizations which

operated ionizing radiation sources and radioactive substances. The enterprises of the system «Radon» reprocessed RW and carried out their long-term storage. Some enterprises of NFC also transferred formed RW to enterprises of the system «Radon». By the decree of the President of the Russian Federation of 20.03.2008 the enterprises of the system «Radon» were subjected to the Rosatom (excluding FSUE MosNPO «Radon»). At present time they have been united into one State enterprise FSUE «Enterprise for management of radioactive wastes «RosRAO» (FSUE «RosRAO»), which comprises as subsidiaries 14 special combines. Since 01.01.2011 Northern Federal enterprise for RW management (FSUE «SevRAO») and Far east Federal enterprise for RW management (FSUE «DalRAO») merged with FSUE «RosRAO».

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- Implementation of integrated engineering-radiation and radiation-hygienic inspections of the status of the shutdown nuclear facilities, storage facilities and other objects of nuclear legacy; pre-design and design works to render these objects into the condition that ensures long-term environmental safety.

For the realization of the final stage of RW management are carried out the pre-design and research work at the sites scheduled for location of RW disposal facilities.

Section C. Scope of Application (Article 3)

Article 3. Scope of application

- 1. This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.*
- 2. This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive substances and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or if it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.*
- 3. This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defense programs, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defense programs if and when such materials are transferred permanently to and managed within exclusively civilian programs.*
- 4. This Convention shall also apply also to the discharges as is envisaged in the articles 4, 7, 11, 14, 24 and 26.*

C.1. Russian Federation declares that:

It will inform on the safety of management of SNF when SNF results from operation of civilian nuclear reactors, including the safety of management of SNF stored at the reprocessing facilities, interpreting the SNF reprocessing as a part of SNF management in terms of Article 3 (1) of the Convention.

C.2. Russian Federation declares that:

It will apply the Convention to the RW management when RW results from civilian applications. This report is not applied to the waste which contains only naturally occurring radionuclides, unless RW have been formed as a result of an activity envisaged in the article 4 of the Federal Law «On the Use of Atomic Energy».

C.3. Russian Federation declares that:

It will consider discharges/releases as is envisaged in Articles 4, 7, 11, 14, 24 and 26 of the Convention.

Explanations:

This Section contains confirmation of compliance with obligations resulting from Article 3 of the Convention.

Section D. Inventories and Lists (Article 32)

Article 32. Reporting

32-2. This report shall also include:

- i) a list of the spent fuel management facilities subject to this Convention, their location, main purpose and essential features;*
- ii) an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain a description of the material and, if available, give information on its mass and its total activity;*
- iii) a list of the radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;*
- iv) an inventory of radioactive waste that is subject to this Convention that:
 - a) is being held in storage at radioactive waste management and nuclear fuel cycle facilities;*
 - b) has been disposed of; or*
 - c) has resulted from past practices.**

This inventory shall contain a description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;

- v) a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.*

D.1. SNF Management Facilities (Article 32 (i))

NPPs, research reactors, and nuclear-propelled icebreaker fleet are the SNF generators in Russia. Outside Russia there are a number of NPPs and research reactors which use Russia-made nuclear fuel during their operation. A part of this fuel has been returned or will be returned to the Russian Federation. More detailed information is given in section B.2.

A list of facilities for SNF storage and reprocessing (storage facilities and reprocessing plant) is given in Table B.1.1 of Annex B1.

Major SNF management facilities are described below.

D.1.1. SNF Management at NPPs

As of 01.01.2011, Russia operates 32 nuclear power units with a total power capacity of 24,242 MW. The on-site SNF storage facilities store 14,112 tons of SNF, including 12,592 tons of RBMK SNF.

The SNF of RBMK reactors is stored at NPPs in at-reactor spent fuel pools and on-site storage facilities. SNF of EGP is stored at NPP, of the three available cooling pools existing at the NPP site two have already been filled and these are used as dry storages.

The SNF of WWER-1000 reactors is kept in at-reactor spent fuel pools and on-site storage facility, after three or more years of storage is taken to the centralized wet storage facility at MCC.

The SNF of WWER-440 and BN-600 reactors is kept in at-reactor spent fuel pools and after three or more years of storage is taken to PA Mayak.

The SNF of shutdown AMB reactors at Beloyarsk NPP is stored in NPP's at-reactor spent fuel pools (4,996 SFAs) and at PA Mayak (2,202 SFAs).

Tables B1.1 and B1.2 of Appendix B1 provide data on placement and quantities of SNF of different reactor types, as of 01.01.2011. Largest quantities of SNF are at NPPs with RBMK reactors and MCC.

D.1.2. Research Reactor SNF Management

Research reactor SNF has been partially reprocessed at RT-1 plant. Some part of SNF has not been reprocessed and is accumulated in temporary storage facilities of research centers. The temporary storage facilities of research centers keep about 106 tons of SNF under controlled storage.

A list of facilities for storage and reprocessing of research reactor SNF is given in Table B1.1. of Appendix B1.

D.1.3. SNF Management at PA Mayak

PA Mayak is one of the first nuclear industry enterprises of Russia. It includes RT-1 plant which has been in operation since 1977.

RT-1 plant's main tasks are to receive, temporary store and reprocess different SFAs: WWER-440 and BN-600 power reactors, research reactors and propulsion reactors of nuclear icebreaker fleet.

The SNF reprocessing at RT-1 is based on aqueous extraction technique that is similar to traditional PUREX-process.

A list of SNF storage and reprocessing facilities is given in Table B1.1. of Appendix B1.

D.1.4. SMF Management at MCC

The WWER-1000 SNF storage at MCC is arranged in the wet storage facility commissioned in 1986.

The wet storage facility for WWER-1000 SNF has been refurbished to expand its capacity from 6,000 t up to 8,400 t at MCC.

As of 01.01.2011, 6,030 tons (with regard to uranium dioxide) of WWER-1000 SNF are under controlled storage.

In 2011 it is planned to commission a start-up complex of the dry storage facility designed for some 8,100 tons (with regard to heavy metal) of RBMK SNF; by 2016 it is planned to commission the dry storage facility designed for 7,800 tons of WWER-1000 SNF; and by 2020 Phase Two of the dry storage facility for 15,000 tons of RBMK SNF is to be commissioned.

The work is underway to develop a Pilot demonstration center (PDC) for SNF reprocessing using innovative technologies.

By the present time:

- the project «Development of the Pilot Demonstration Center for SNF Reprocessing Using Innovative Technologies at MCC has been developed and passed the state evaluation procedure;
- key operation – from thermo-chemical destruction of the fuel through conditioning of radioactive waste – have been tested;
- design documentation for the equipment has been developed; mock-ups of some units of the experimental equipment have been designed and tested.

D.2. SNF Inventories (Article 32 (ii))

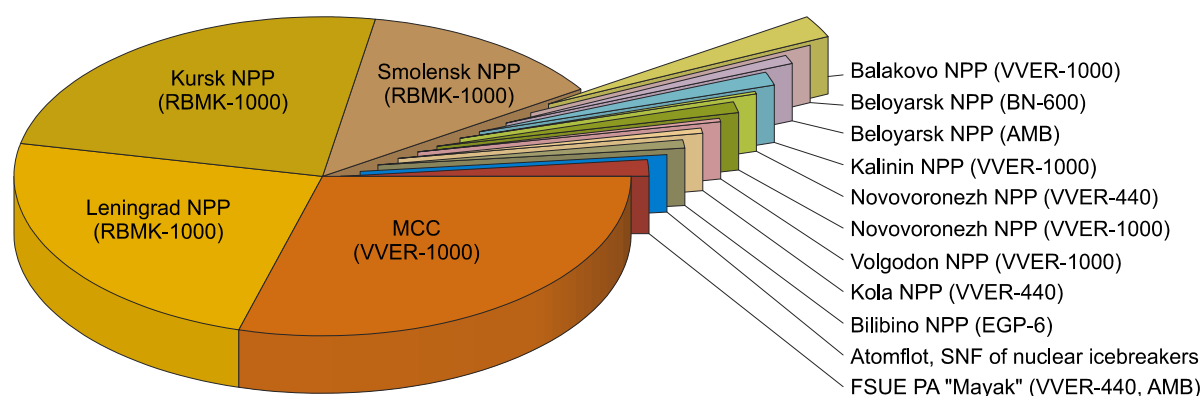
The Russian Federation has accumulated about 21,714 t of SNF which is held in on-site and at-reactor storage facilities, as well as at enterprises for SNF reprocessing and centralized storage (Table B.1.2 of Annex B1.).

Besides, a certain amount of SNF of the nuclear icebreaker fleet is held on FMBs «Lepse», «Lotta» and «Imandra».

The SNF of the civilian nuclear fleet is stored on technical support ships of FSUE Atomflot and in the coastal container storage facility for SNF of the icebreaker fleet.

FMBs «Lotta» and «Imandra» store 4.59 tons (as recalculated to uranium metal) of SFAs. The «Lotta» (45% of a total quantity) and SNF coastal storage facility contain unreprocessible uranium-zirconium fuel.

The FMB «Lepse» stores 2.52 tons (as recalculated to uranium metal) of SFAs.



SNF at enterprises in Russia

D.3. RW Management Facilities (Article 32 (iii))

At present, over 90 facilities for reprocessing of different types of RW are in operation (commercial or pilot).

Types of RW management facilities being introduced at enterprises are determined by features of processes that generate RW, as well as by safety requirements as to minimization of RW quantities and producing RW packages suitable for safe long-term storage and disposal.

The facilities of highest reprocessing capacity to note employ the following processes:

Re-melting — Ecomet-S (SRW, LLW; 2,000 tons/year),

Vitrification — PA Mayak (LRW, HLW; 300-500 l/h)
SUE MosNPO Radon (LRW, ILW; 200 l/h),

Incineration — SUE MosNPO Radon
(LRW ILW; 20 l/h; SRW ILW; 60 kg/h)

Cement solidification — at NPPs, a standard facility (LRW, SRW, ILW; 255 m³/year)

The most exhaustive RW reprocessing equipment sets are at:

- SUE MosNPO Radon, including facilities for vitrification, compaction, incineration etc.;
- Balakovo NPP: waste treatment center, including facilities for sorting, bituminization, compaction, incineration, cementation etc.

Recently, a number of new facilities have been commissioned:

- an installation for electrochemical decontamination was accepted for pilot commercial operation at Novovoronezh NPP in 2009;
- installations for sorting, incineration and compaction of SRW commissioned at Rostov NPP in 2010;
- facilities for sorting, incineration and compaction of SRW were commissioned at Leningrad NPP in 2011.

A number of new facilities for RW reprocessing are planned to implement at nuclear power plants, including facilities for:

- ion-selective clean-up of LRW: Leningrad NPP, Kursk NPP, Smolensk NPP, Novovoronezh NPP (2013);
- plasma incineration of RW: Novovoronezh NPP (2014).
- The FTP «Nuclear and Radiation Safety» plans for large-scale activities to develop RW management facilities at NFC enterprises, including:
 - development of a complex for cementation of liquid and heterogeneous intermediate-level LRW at PA Mayak (2013);
 - development of a combined sewerage system at PA Mayak;
 - commissioning of a new electric furnace ER-500/5 at PA Mayak for vitrification of HLW; the furnace features a longer service life and vitrification capacity of up to 80 mln Ci per year; the vitrified waste storage facility is also to be expanded (2013);
 - construction of a facility for disposal of organic LRW at SCC (incineration of spent oil) (2011) etc.

Under the FTP «Nuclear and Radiation Safety», implementation is continued to develop new and refurbish existing RW storage facilities, including:

- construction of new storage facilities:
 - ♦ long-term storage facility for solidified RW in mining tunnels at MCC (the project was given a positive statement after the state safety evaluation);
 - ♦ SRW above-surface storage facilities at a number of FSUE RosRAO branches with a total storage capacity of about 10,000 cubic meters (Saratov and Leningrad branches).
- refurbishing of more than 15 facilities for RW storage;
- construction of a facility for final isolation of RW (Krasnoyarsk Territory, Nizhne-Kansky Rock Mass);
- activities to change conditions of storage and treatment for disposal of SRW being in responsibility of FSUE Atomflot (Murmansk);
- activities to put under care and maintenance industrial reservoirs V-9 and V-17 at PA Mayak, reservoirs B-1, B-2, B-25 and slurry storages PKh-1, PKh-2 at SCC, and storage reservoirs at MCC etc.
- activities to ensure care and maintenance and carry out environmental rehabilitation of tail dumps.

D.4. RW Inventories (Article 32 (iv))

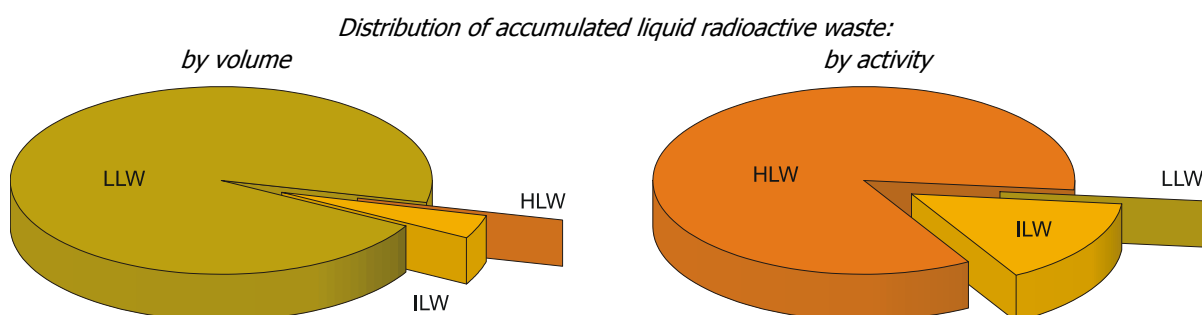
As of the end of 2010, a total of over 486 mln m³ ($4.27 \cdot 10^{19}$ Bq) of LRW and 87 mln tons of SRW ($3.59 \cdot 10^{19}$ Bq) were accumulated.

D.4.1. RW Generation and Reprocessing

The RW generation sources are:

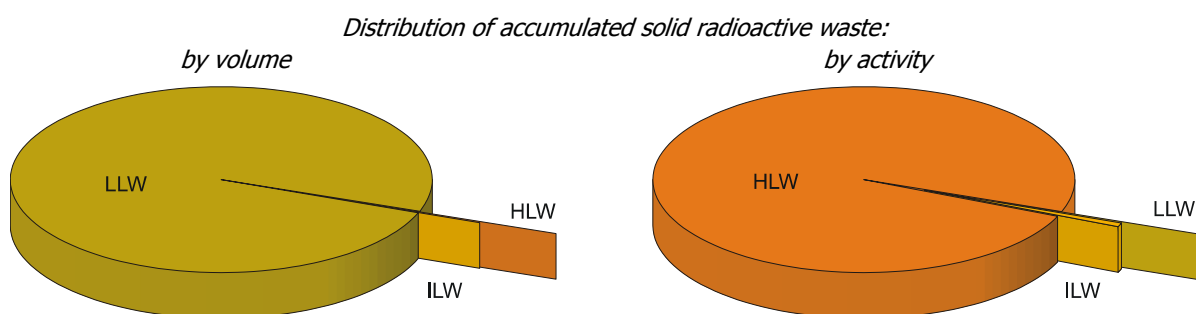
- mining and processing of radioactive ores;
- sublimation and segregation works, fabrication of nuclear fuel;
- operation of NPPs, nuclear research facilities, nuclear fuel cycle (NFC) enterprises, vessels with nuclear power units and their maintenance bases;
- SNF reprocessing;
- use of NM, RS and ionizing radiation sources (IRS) in industry, medical institutions, research institutes etc.;
- decommissioning of nuclear facilities and rehabilitation of areas contaminated with radioactive substances.

RW generation in 2010 (Table B2.1, B2.2):



- 3.0 mln m³ of LRW with a total activity of $1.83 \cdot 10^{18}$ Bq, of which 92.7% of a total volume of LLW with an activity of $1.7 \cdot 10^{14}$ Bq, 6.8% of ILW — $8.8 \cdot 10^{16}$ Bq, and 0.5% of HLW — $1.74 \cdot 10^{18}$ Bq;
- about 1.4 mln t of SRW, of which 97% by mass are low-level waste of ore processing with a total activity of $3.3 \cdot 10^{14}$ Bq or 0.003% in terms of activity of all SRW being generated.

In addition, reprocessing of high-level LRW at PA Mayak produces annually some 500 t of vitrified waste; as of the end of 2010, a total activity of such waste was about $1.89 \cdot 10^{19}$ Bq.



Major sources of new RW generation and accumulation are NPPs and NFC enterprises.

Assessments have demonstrated that of the quantity of RW accumulated by the present time, up to 0.1% of a total RW activity originated from NPPs with the remainder major fraction resulted from NFC enterprises. The latter circumstance is conditioned by features of radiochemical processes.

In 2010, nuclear industry enterprises reprocessed about 2.2 mln m³ of LRW and 4,000 tons of SRW.

D.4.2. RW Placement and Storage

All RW is placed in 1,466 temporary storage facilities at 136 enterprises located in 43 regions of the Russian Federation (RW in volumes exceeding 1,000 tons of SRW and/or more than 1,000 cubic meters of LRW are at 83 enterprises and 330 temporary storage facilities) and in 3 disposal facilities (under continuous monitoring) in deep geological formations.

The major fraction of LRW (97.1%) accumulated at nuclear industry enterprises is low-level RW (97.1%) which activity is $8.43 \cdot 10^{15}$ Bq (about 0.02% of the total activity of LRW), of which 99% is in the storage facilities at PA Mayak and SCC.

A large amount of intermediate-level LRW (89%) is consolidated at SCC, MCC, RIAR and is isolated from the environment in deep geological formations.

High-level LRW represents less than 0.5% of a total amount of LRW; its activity is about 42% of the total activity of LRW. All high-level LRW is isolated from the environment.

Of 69 mln tons SRW accumulated at nuclear industry enterprises the main bulk is low-level RW and about 97% of such waste is at ore mining and processing enterprises (PIMCU (90%) and CMP (5%).

The main bulk of activity (98%) is concentrated in high-level SRW, which is placed in special buildings and isolated from the environment.

D.4.3. SRS and RTGs

SRS, which have exhausted their service lives, are an additional source of RW. According to the state control and accounting of radioactive substances and RW data, an average annual generation of such RW is 40,000 items.

In coming years, service lives of all RTGs (as of 01.01.2011, 224 RTGs were in operation) expire; all of them are subject to decommissioning.

The State Atomic Energy Corporation «Rosatom» has developed a work procedure related to RTG decommissioning.

D.4.4. Activities to Render RW Environmentally Safe

All high-level LRW, which is about 35% of a total activity of all LRW, have been isolated from the environment.

At the present time, LRW storage facilities that are not isolated from the environment host about 12% (in terms of activity of all liquid LLW and ILW) accumulated as a result of the past defense programs.

For the coming years the main task is to reduce fraction of such waste and develop new RW conditioning capacities.

Large-scale activities to render the LRW storage facilities safe are planned under the FTP «Nuclear and Radiation Safety», in particular, putting under care and maintenance industrial reservoirs V-9 and V-17 at PA Mayak, reservoirs B-1, B-2, B-25 and slurry storages PKh-1, PKh-2 at SCC, and storage reservoirs at MCC etc.

D.5. Decommissioning of Nuclear Facilities (Article 32 (v))

At present in the Russian Federation, 4 nuclear power units, 11 research reactors, 13 production uranium-graphite reactors and over 30 of other nuclear fuel cycle enterprises are in preparation for decommissioning.

In 2008-2010, basic decommissioning activities at nuclear installations were accomplished as follows: gaseous diffusion equipment of Building 8 and Site 115a at SCC was phased out; reactor installations VVRL-02,03 at FSUE NIIP were decommissioned; an installation for re-processing of uranium metal at CHMP was phased out.

Section E. Legislative and Regulatory System

E.1. Implementing Measures (Article 18)

Article 18. Implementing Measures

Each Contracting Party shall take, within the framework of its national legislation, its legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention.

With adoption of Federal Law № 139-FL of 04.11.2005 «On Ratification of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management» the provisions of the Convention have become binding to comply with for all executive authorities and organizations involved in SNF and RW management.

The valid legislation of Russian Federation in the field of SNF and RW management allows to comply with the obligations resulting from the provisions of the Convention.

The Convention serves as the basis for further improvement of Russian normative legal Acts, which regulate issues of the safe spent nuclear fuel and radioactive waste management according to the obligations of Russian Federation.

E.2. Legislative and Regulatory System (Article 19)

Article 19. Legislative and Regulatory Framework

19-1 Each Contracting Party establishes and maintains a legislative and regulatory framework to ensure the safety of spent fuel and radioactive waste management.

19-2 This legislative and regulatory framework provides for:

- I) the establishment of appropriate national safety requirements and regulations for the radiation safety;*
- II) a system of licensing the activities of spent fuel and radioactive waste management;*
- III) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a license;*
- IV) a system of appropriate administrative and regulating control, documentation and reporting;*
- V) the enforcement measures to comply with valid regulations and license conditions;*
- VI) a distinct distribution of responsibilities of the authorities involved in the different steps of spent fuel and of radioactive waste management.*

19-3 When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall duly take into account the objectives of this Convention.

E.2.1. Legislative, legal and normative regulation

Regulation of the relationships in the field of SNF and RW management is carried out on the basis of the Constitution of Russian Federation, international agreements and conventions (including the Joint Convention on the safety of spent fuel management and the safety of radioactive waste management, the Convention on nuclear safety, the Vienna Convention on civil liability for nuclear damage, the Convention on early notification of a nuclear accident, the Convention on physical protection of nuclear materials and others), federal laws of Russian Federation, normative legal Acts of the President of Russian Federation and the Government of Russian Federation, federal norms and rules in the field of use of atomic energy, normative documents of the State authorities regulating safety and of the State au-

thorities which administer the use of atomic energy, State and industry-wide standards, and technical regulations.

By virtue of the Article 15 para. 4 of the Constitution of Russian Federation worldwide acknowledged principles and norms of the international law, to which pertain the above-mentioned Conventions and international agreements of Russian Federation, are an integral part of its legislative system and have a greater legal effect than federal laws.

The legal framework regulating the safety issues by the use of atomic energy in Russian Federation are:

- Federal Law № 170-FL of 21.11.1995 «On the Use of Atomic Energy»;
- Federal Law № 3-FL of 9.01.1996 «On the Radiation Safety of Population»;
- Federal Law № 7-FL of 10.01.2002 «On the Environmental Protection»;
- Federal Law № 190-FL of 11.07.2011 «On the Radioactive Waste Management and on the Changes in Some Legislative Acts of Russian Federation»;

Federal norms and rules valid in the field of use of atomic energy according to the Federal Law «On the Use of Atomic Energy» (article 6) establish requirements for safe use of atomic energy, compliance with which is binding by the implementation of all activity in the field of use of atomic energy. List of federal norms and rules valid in the field of use of atomic energy, as well as the changes in the above-mentioned list and supplements to it are approved by the Government of Russian Federation. Norms and rules in the field of use of atomic energy are elaborated and approved in the order established by the Government of Russian Federation.

Federal norms and rules establish requirements binding for compliance for all legal entities and physical bodies carrying out their activity in the field of use of atomic energy and are valid in the whole territory of Russian Federation.

The safety of SNF and RW management is regulated also on the basis of safety guides and guiding documents issued by the State safety regulatory authorities, documents elaborated by the State authorities, which administer use of atomic energy (departmental documents), State and industry-wide standards.

E.2.1.1. Federal Laws

The Federal Law № 170-FL of 21.11.1995 «**On the Use of Atomic Energy**» is the fundamental document regulating relationships in the field of the use of atomic energy, which is aimed at environmental protection, protection of health and life of people by the use of atomic energy and determines the legal basis for regulation of safety, including:

- principles of legal regulation in the field of the use of atomic energy;
- competences, rights and authorities of different parties of the legal regulation in the field of use of atomic energy (President and Government of Russian Federation, State Federal and local authorities, organizations and citizens, authorities of State administration and State authorities regulating safety of the use of atomic energy);
- the legal status of organizations carrying out activities in the field of the use of atomic energy, responsibilities and obligations of the operating organization to ensure safety of a nuclear facility, radiation source and storage facility;
- principles of a State regulation of safety by the use of atomic energy;
- an order of decision-making as regards choice of site and construction of nuclear facilities, radioactive sources and storage facilities, as well as regards their decommissioning;

- State policy in the field of nuclear materials, radioactive substances and RW management; main provisions of management of nuclear materials, radioactive substances and RW;
- responsibilities for losses and damage caused by radiation impact to legal entities and physical persons, health of the citizens, and liability for violation of the legislation of Russian Federation in the field of use of atomic energy;
- principles and order for export and import of nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special non-nuclear material, and services in the field of use of atomic energy;
- provisions on compliance with the international obligations of Russian Federation in the field of use of atomic energy, information exchange with foreign countries in the field of use of atomic energy.

This law (Article 44) stipulates that the State policy in the management of nuclear materials, radioactive substances and RW should provide for an integrated solution of issues related to normative regulation of their production, generation, use, physical protection, collection, registration and accounting, transportation, storage and disposal.

The Articles 45-48 of the law stipulate that during the transportation, storage and reprocessing of nuclear materials (including SNF) and RW, as well as by the disposal of RW, the reliable protection of workers of objects of the use of atomic energy, population and environment should be ensured against radiation impact and radioactive contamination impermissible in accordance with norms and rules valid in the field of use of atomic energy and legislation of Russian Federation in the field of environmental protection.

The Article 5 of the law stipulates that nuclear materials (including RW, containing nuclear materials) and nuclear facilities can be owned both by the Federal State and by the legal entities. A list of Russian legal entities which can own nuclear materials (including RW, containing nuclear material) or nuclear facilities is approved by the President of Russian Federation. Owners of nuclear facilities and nuclear materials exercise control over their security and appropriate use. Nuclear materials, irrespectively of the form of ownership, are subject to the State accounting and control of nuclear materials.

Federal Law № 3-FL of 9.01.1996 «**On the Radiation Safety of Population**» defines the legislative basis to ensure the radiation safety of the population in order to protect its health. The law establishes main principles to ensure radiation safety, main hygienic normative standards (permissible dose limits) of exposure to irradiation in the territory of Russian Federation as a result of the use of ionizing radiation sources.

The dose limits values for personnel and population irradiation established by this law are given in Section F.

Federal Law № 190-FL of 11.07.2011 «**On the Radioactive Wastes Management and on the Changes in Some Legislative Acts of Russian Federation**» regulates the relationships occurred by the management of accumulated and being formed RW, stipulates principles of functioning and structure of unified State system for RW management, establishes organizational and legal basis for RW management.

According to this law in Russian Federation is created the unified State system (USS) for management of RW, the main aim of which is to organize and ensure the safe and economically effective RW management, including their disposal. The main principles of functioning of USS of RW are following:

- Priority of the protection of human health and life, the protection of present and future generations and of the environment against the negative impact of RW;
- Prohibition of importation in and exportation from Russian Federation of RW for their storage, reprocessing and disposal, excluding the cases envisaged by the article 31 of the law;
- Responsibility of the organizations, the result of whose activities is the formation of RW, to ensure safety by RW management, until they transmit RW to national operator;
- Financial provision of the activity of RW management, including their disposal on the base of funds of the organizations, the result of whose activities is the formation of such RW;
- Taking into account of the mutual dependence of the stage of RW formation and the stages of their management;
- Accessibility for citizens and social associations of the information, connected with safety provision and prevention of emergency cases by the RW management, as well as of the other information about RW management, if this information doesn't contain any data of the State secret;

The article 20 of the law stipulates the creation of the national operator for RW management – organization, defined by the Government of Russian Federation according to the proposal of State authority, which administer RW management, - to plan, organize and carry out activities of RW management, including their long-term storage and disposal.

For financial provision of the RW management activities it is envisaged by the law to use the special reserve Fund, which is created on the base of regular payments of the producers of radioactive wastes. The volume of payments is calculated according to the volume of RW formation on the base of tariffs for disposal, established by the Federal tariff service.

According to the article 30 of the law the disposal of the liquid low-level and intermediate-level RW in the subsoil of their mining lot is permissible only in the points of the deep disposal of RW, which had been constructed and were operated before the day when this law was put in force.

Federal Law № 52-FL of 30.03.1999 «On Sanitary and Epidemiological Well-being of the Population» defines the legislative bases to ensure the sanitary and epidemiological well-being of the population. The law establishes sanitary and epidemiological requirements for industrial and technical products, production premises, working conditions with resources of physical factors affecting humans, water objects, atmospheric air and soil.

General sanitary and epidemiological requirements for storage and disposal of production and consumption wastes are stipulated in the article 22 of law. According to the Article 27 of law, the storage and disposal of radioactive substances, materials and wastes is allowed when exist the sanitary and epidemiological statements which confirm the compliance of the working conditions with the sources of physical factors affecting humans (ionizing radiation) with sanitary rules.

Federal Law № 7-FL of 10.01.2002 «On the Environmental Protection» defines the legislative bases of the State policy in the field of environmental protection. The law establishes main principles of the environmental protection, the necessity of normative regulation of permissible impacts on the environment and limitation for the location of production wastes.

In regard to RW and SNF, the law contains the following norms:

- it prohibits importation of RW from foreign states for storage, disposal, or neutralization, as well as its dumping in water and disposal in outer space (Articles 48, 51);
- it prohibits discharge of production and consumption wastes, including RW, in surface and ground water objects, catchment areas, into subsoil and on soil (Article 51);

- it prohibits placement of RW in certain territories where danger may arise for the environment, natural ecological systems and human health (Article 51);
- the SNF importation to the Russian Federation from foreign states for temporary technological storage and (or) their reprocessing is permitted if a reduction of general risk of radiation impact and enhancement of level of environmental safety owing to the implementation of a corresponding project is substantiated, taking into account the priority of the right to return the RW formed after reprocessing to state of origin of the SNF or to ensure such return (Article 48);
- it establishes the necessity of the State ecological expert examination, as well as the objects subject for such expert examination;

Federal Law № 174-FL of 23.11.1995 «On Ecological Expert Examination (Environmental Review)» regulates the relationships in the field of State and public ecological expert examination. The Law defines objects and procedure for implementation of obligatory State ecological expert examination on various levels, as well as objects and conditions for implementation of public ecological expert examination.

Ecological expert examination is defined by the law as a identification of compliance of planned economical and other activity with the ecological requirements and as a definition of a permissibility of the realization of the object of this ecological expert examination in order to prevent the possible negative impacts of this activity on the environment and social, economical and other consequences connected with these impacts in the case of realization of the expert examination's object.

Federal Law № 68-FL of 21.12.1994 «On the Pprotection of the Population and Territories against Emergencies of Natural and Man-induced Origin» defines organizational and legal norms in the field of protection of the population, environment, as well as industrial facilities and social objects against natural and man-induced emergencies. The law determines the main principles of protection of the population and territories against emergencies, the procedure for preparedness and responding in case of emergencies.

Urban Development Code of Russian Federation № 190-FL of 29.12.2004 establishes the main principles of legislation concerning the urban development activities, regulates the relationships occurring by the implementation of construction, reconstruction and overhaul of the objects of capital construction, including the objects of use of atomic energy, as well as defines necessity to carry out the State building supervision by the construction, reconstruction and overhaul of the objects of the use of atomic energy.

The Water Code of Russian Federation № 74-FL of 03.06.2006 regulates the relationships by the use and protection of water objects (surface and ground) which are owned by the state, municipality or privately.

The article 56 of the law imposes limits on the use of water objects as follows:

- discharge to water objects and disposal of production and consumption wastes in them... is prohibited;
- disposal of nuclear materials, radioactive substances in water objects is prohibited;
- discharge to water objects of sewage waters, where the contents of radioactive substances... and other substances and compounds hazardous for human health exceed permissible normative limits of impact on the water objects, is prohibited.

Therefore, the law prohibits disposal of RW in water objects, but does not prohibit discharge of radioactive substances, establishing requirements demanding that the contents of radioactive substances in discharge waters should not exceed permissible limits.

For reference: Up to 2010 water reservoirs of a number of nuclear fuel cycle (NFC) enterprises, which were created in the period of urgent implementation of defense programs, had the status of so-called «industrial water reservoirs». Their operation was regulated by the special decrees of the Government of Russian Federation and by the conditions of Rostekhnadzor licenses.

In the end of 2010 the «industrial water reservoirs» of FSUE «PA Mayak» have obtained the status of objects of use of atomic energy (or of their elements). The location within these objects of the waters containing radioactive substances is regulated by the conditions of the operational licenses. The normative regulation of the release of the radioactive wastes from these objects to the environment is defined by the normative standards for the permissible discharge.

The law of Russian Federation No 2395-1 of 21.02.1992 «On Subsoil Resources» contains a norm that directly regulates the issues of deep disposal of RW (which includes disposal of liquid RW in deep geological layers). The Article 10 of law stipulates that the legal basis to obtain the right to use subsoil for the purposes of RW disposal in deep geological layers, which ensures confinement of such wastes, may be a decision of the Government of Russian Federation coordinated with executive authorities of the subjects of Russian Federation.

The Criminal Code of Russian Federation No 63-FL of 13.06.1996 and The Code of Russian Federation on Administrative Violations No 195-FL of 30.12.2001 establish liability for crimes and violations of law in the field of use of atomic energy;

The Criminal code of Russian Federation establishes liability for a violation of safety rules at the objects of the use of atomic energy, which could incur or incurred a human death or radioactive contamination of the environment (Article 215), as well as for a violation of rules of RW and SNF management (Article 247);

In 2009 the Federal Law № 377-FL of 27.12.2009 **«On the Changes of Some Legislative Acts According to the Introduction of the Provisions of the Criminal Code of Russian Federation and the Penal Code of Russian Federation concerning the Punishment of Personal Restraint»** has brought the change in the article 215 of the Criminal code providing for the penalty increase for the violation of the safety rules on the objects of use of atomic energy, which could incur or incurred a human death or contamination of the environment.

In 2011 Federal Law № 26-FL of 07.03.2011 **«On the Changes of the Criminal Code of Russian Federation»** has brought the change in the article 247 for abolition of the lower limit of punishment for the violation of the rules of management with the ecologically hazardous substances and wastes, incurring by negligence the human death or large-scale human poisoning.

The Code of the Russian Federation on administrative violations establishes liability for a violation of rules of the use of atomic energy and accounting of nuclear materials and radioactive substances (Article 9.6); for non-licensed entrepreneurship (Article 14.1); for the failure to timely observe a legal improvement notice issued by a State supervision authority (an official) (Article 19.5); as well as for the failure to observe the environ-

mental, sanitary and hygienic requirements for management of wastes and other hazardous substances (Article 8.2); for concealment of information or provision of false information about the ecological and radiation situation (Article 8.5). In addition, the Code defines competences of the officials of regulating authority to review the cases of administrative violations of such a kind.

Federal Law № 92-FL of 10.07.2001 «**On special Ecological Programs for Remediation of Radioactively Contaminated Territories**» defines features of the State regulation of the relationships in the field of elaboration and realization of special ecological programs for remediation of parts of territories contaminated with the radiation. The law stipulates that special ecological programs are funded with hard currency obtained from foreign trade operations with SNF. The SNF-related foreign deals are concluded by an organization especially authorized by the Government of Russian Federation only if there is a positive statement of the State ecological expert examination.

Federal Law № 29-FL of 3.04.1996 «**On Financing of Particularly Radiation Hazardous and Nuclear Hazardous Production Enterprises and Objects**» includes a norm that secures budget funding of works to ensure safe and sustainable functioning of particularly hazardous radiation and nuclear productions and objects. Article 3 of this law includes the norm binding the organizations, which operate particularly hazardous radiation and nuclear productions and objects, to form the centralized funds to finance activities aimed at improvement of technologies and enhancement of safe functioning of these objects.

In 2002 has been approved the **Federal Law** № 184-FL of 27.12.2002 «**On the Technical Regulation**». It establishes that the binding requirements to the safety of products, production processes, operation, storage and transportation may be set forth only by technical regulations which are adopted by a federal law, a decree of the President of Russian Federation or a decree of the Government of Russian Federation.

The law was amended in 2007; in particular, a new revision of the Article 5 was introduced stipulating that in regard to products and objects subject to requirements necessary to ensure nuclear and radiation safety in the field of the use of atomic energy, along with the requirements of the technical regulations, should be obligatory the requirements set forth by the Federal authorities of State administration and State regulation of safety by the use of atomic energy.

In 2008 has been adopted the Technical regulation № 123-FL of 22.07.2008 about the requirements of fire safety, which stipulates the general requirements of fire safety to the objects of protection, including the objects of use of atomic energy.

In 2009 has been adopted the Technical regulation № 384-FL of 30.12.2009 about the safety of buildings and constructions, which stipulates the necessary requirements to the buildings and constructions (including functioning as their parts networks and systems of engineering and technical infrastructure), as well as to the processes of design (including investigation works), construction and erection, adjustment, operation and utilization (demolition) concerning these buildings.

After the presentation of the Second National Report there have been introduced some changes in the federal laws, regulating issues of the use of atomic energy.

In 2009 was put into force the Federal Law № 294-FL of 26.12.2008 «**On the Protection of the Rights of the Legal Entities and Sole Proprietors by the Implementation of the State Control (Supervision) and Municipal Control**», which introduces essential

limitations for the implementation of supervision by the regulation of the safety of objects of use of atomic energy. The provisions of law, establishing the order of the organization and realization of the supervision measures for activity in the field of use of atomic energy, are valid since 1.07.2011.

In 2011 was adopted the Federal Law № 242-FL of 18.07.2011 «**On the Changes in Some Legislative Acts of Russian Federation Regarding Issues of Implementation of State Control (Supervision) and Municipal Control**», which establishes the notion of the «Federal State supervision in the field of use of atomic energy». This law establishes the basis for implementation of planned and not planned supervision measures (inspections), the time period for implementation of the supervision measures, competences of the regulatory officials, as well as the possibility of the introduction of the regime of constant State supervision on some objects of use of atomic energy. The list of the objects of use of atomic energy, which are subject to the introduction of such regime, and the order of its implementation are defined by the Government of Russian Federation.

In 2011 was adopted the Federal Law № 35-FL of 08.03.2011 «**Statute on the Discipline of the Workers of Organizations, Operating Particularly Hazardous Radiation and Nuclear Production Facilities and Objects in the Field of Use of Atomic Energy**», which establishes the higher requirements to observe the discipline by some categories of the personnel of organizations, operating particularly hazardous radiation and nuclear production activities and objects in the field of use of atomic energy.

The list of the main legislative Acts, (including also the Acts approved in the time covered by this report) regulating RW and SNF management, is given in the Annex E.

E.2.1.2. Normative Legal Acts of the President of Russian Federation and Government of Russian Federation

In elaboration of provisions of the Federal Law «On the Use of Atomic Energy», as well as of other federal laws related to the uses of atomic energy, the President of Russian Federation and the Government of Russian Federation adopt the normative legal Acts in the form of decrees of the President of Russian Federation and ordinances of the Government of Russian Federation.

For the period passed after the presentation of the Second National Report has been approved a series of the new normative legal Acts on the issues related to the use of atomic energy and were introduced the changes in the normative Acts of the President of Russian Federation and Government of Russian Federation valid before.

The decree of the President of Russian Federation № 780 of 23.06.2010 «**Issues of the Federal Environmental, Industrial and Nuclear Supervision Service**» has established that the activities of the Federal service of ecological, technological and nuclear supervision are administered by the Government of Russian Federation.

In 2010 has been adopted the Ordinance of the Government of Russian Federation № 717 «On the changes of some ordinances of Government of Russian Federation regarding the competences of Ministry of Natural Resources and Environment of Russian Federation, Federal service on supervision in sphere of wildlife management and Federal service of ecological, technological and nuclear supervision», which has transferred the functions and competences of Ministry of Natural Resources and Environment of Russian Federation in the field of the regulation of nuclear and radiation safety to Rostekhnadzor. By the same Ordinance to Rostekhnadzor have been transferred the functions to set forth the normative standards for minimum permissible releases and discharges of the radioactive substances into the envi-

ronment and to issue the licenses for releases and discharges; the competences of Rostech-nadzor in the field of State ecological expert examination are transferred to the Federal service on supervision in sphere of wildlife management (Rosprirodnadzor).

In 2011 has been adopted the Ordinance of the Government of Russian Federation № 88 of 17.02.2011 «On the approval of the provision on the acknowledgement of the organization as appropriate to operate the nuclear facility, radiation source or storage facility and to carry out per se or with involvement of other organizations the activities for location, design, construction, operation and decommissioning of the nuclear facility, radiation source or storage facility, as well as the activities of management of nuclear materials and radioactive substances», which establishes the order and conditions to acknowledge the organization appropriate to operate the nuclear facility, source of radiation or storage facility by the authorities competent to administer the use of atomic energy (including Rosatom).

The list of the main bylaw Government Acts, valid in this field, is shown in the List E of this Report.

E.2.1.3. Federal Norms and Rules in the Field of Use of Atomic Energy

According to the Ordinance of the Government of Russian Federation No 1511 of 01.12.1997 «On the approval of the provision for the procedure of elaboration and approval of federal norms and rules in the field of use of atomic energy and the list of Federal norms and rules valid in the field of use of atomic energy» Federal norms and rules establish requirements for the safe use of atomic energy, including requirements for nuclear, radiation, industrial (technical) and fire safety, physical protection and control and accounting of nuclear materials, radioactive substances and RW. The elaboration of Federal norms and rules is carried out by State safety regulatory authorities and/or authorities, which administer the use of atomic energy in accordance with their competences. The Federal norms and rules establish requirements for the safe SNF and RW management and are elaborated and introduced for different objects of use of atomic energy (nuclear power plants, nuclear fuel cycle facilities, marine nuclear-propulsion units, research reactors, industrial enterprises, including scientific and medical institutions).

A list of main Federal norms and rules valid in this field is given in Annex E of the Report.

Main Federal norms and rules establishing nuclear and radiation safety requirements for SNF and RW management are described below.

E.2.1.3.1. State Sanitary and Epidemiological Rules, Norms and Hygienic Normative Standards

In Russian Federation are valid Federal sanitary rules, approved and put into force by the Federal executive authority, which implements the normative and legal regulation in the field of sanitary and epidemiological well-being of population. The normative legal Acts, which establish the sanitary and epidemiological requirements, are sanitary rules, sanitary rules and norms, sanitary norms and hygienic normative standards. The observation of sanitary rules is obligatory for citizens, sole proprietors and legal entities.

State sanitary and epidemiological rules, norms and hygienic normative standards, which are approved by the Chief sanitary officer of Russian Federation, establish criteria of safety and (or) harmlessness of the factors of their environment for humans and mandatory requirements, whose non-observance creates a threat to human life or health.

In the Second National Report was noticed, that the fundamental sanitary regulating documents were **the Radiation Safety Norms (standards) (NRB-99), the Main Sanitary**

Rules of Radiation Safety (OSPORB-99) and the Sanitary Rules for Management of Radioactive Wastes (SPORO-2002).

In 2009 have been approved and put into force the new sanitary rules and norms SanPiN 2.6.1.2523-09 «**Radiation Safety Norms (NRB-99/2009)**». The new edition of Radiation safety norms is connected with the publication of new recommendations of ICRP, WHO, standards of IAEA and also the expiration of 10-year period of NRB-99 validity.

The main normative standards of radiation safety, the main limits of doses for different categories of the irradiated persons, the permissible levels of multi-factor impact (limits of the annual intake (LAI)), permissible average annual volumetric activity (PVA), average annual specific activity (PSA) and other have not been changed.

It is proved, that in the conditions of the normal operation of sources of ionizing radiation the limits of the exposure doses during the year are defined according to the following values of individual lifetime risk: for personnel – $1,0 \times 10^{-3}$, for the population – $5,0 \times 10^{-5}$. The level of negligibly minimum risk is set on 10^{-6} .

Since 17.09.2010 according to the expiration of the 10-year period of validity of OSPORB-99, to the publication in this time of a series of new recommendations of ICRP, WHO, standards of IAEA, approval of NRB-99/2009 have been set into force new SP (Sanitary rules) 2.6.1.2612-10 «Main sanitary rules of radiation safety (OSPORB-99/2010)». The most significant changes have been introduced in the sections 3.11 «Management of materials and articles, contaminated or containing of the man-induced radionuclides» and 3.12 «Management of radioactive wastes», namely:

- has been introduced the Annex establishing specific activities of man-induced radionuclides, by which it is permissible the unlimited use of solid, liquid and gaseous materials (Annex 3¹ to OSPORB-99/2010);
- has been introduced the unified boundary of allocation of materials to the solid, liquid and gaseous RW (Annex 4 to NRB-99/2009 for man-induced radionuclides) – p.3.12.2 of OSPORB-99/2010;
- have been established the limitations for the management of wastes, containing man-induced radionuclides with the specific activity less than MSSA² (minimal significant specific activity) (criterion for allocation to RW), but more than the values given in the Annex 3 to OSPORB-99/2010;
- has been introduced the prohibition on the dilution of the LRW in order to diminish their activity (p. 3.12.17);
- has been changed the classification of RW according to their specific activity: in the table 3.12.1 of OSPORB-99/2010 have been set forth some normative standards to allocation of tritium-containing wastes to the low-level, intermediate-level and high-level RW.

By the resolution №167 of the Chief sanitary officer of Russian Federation of 23.12.2010 have been approved in the new version the SanPiN 2.6.6.2796-10 the «**Sanitary Rules for Management of Radioactive Wastes (SPORO-2002)**». SPORO-2002 set forth the requirements to ensure the radiation safety of personnel and population by all types of RW management. The rules concern the organizations, the result of whose activities is the formation of RW, the organizations carrying out collection, storage, transportation, reprocessing and disposal of RW, as well as the organizations, carrying out the design and constructions of the objects, where RW will be formed, stored, reprocessed and disposed. The changes introduced in SPORO-2002 concern the new criteria of allocation of the wastes to the radioactive ones, which (criteria) have been introduced by OSPORB-99/2010.

The innovations envisaged by OSPORB-99/2010 and SPORO-2002 as regards the criteria of allocation of the wastes to radioactive ones have not been realized in practice. It is caused by the fact that the Rules for organization of the system of the State accounting and control of radioactive substances and radioactive wastes continue to be valid without any change, and with the introduction of the Federal Law «On the management of radioactive wastes» the competences to set forth the criteria to classify the wastes pertain to the Government of Russian Federation.

The hygienic requirements to the design of the enterprises and facilities of nuclear industry (SPP PUAP-03, 2003) establish the sanitary and hygienic requirements to protect the human health against the harmful radiation impact by the use of radioactive substances or other sources of ionizing radiation at the industrial enterprises and facilities. The rules concern the enterprises of nuclear industry mining, generating, processing, reprocessing, using, storing, transporting, neutralizing and disposing the radioactive substances, nuclear materials and other sources of radiation.

The Sanitary Rules and Technical Conditions for Operation and Conservation of the Deep Storage Facilities for Liquid Radioactive and Chemical Wastes of the Enterprises of Nuclear Fuel Cycle (SP and TU EKH-93) stipulate the legal basis and area of application of the method of deep geological disposal by the LRW management, regulate the technical conditions for implementation of the works for construction, operation and conservation of deep geological storage facilities according to the requirements of sanitary and radiation safety, establish the structure of the sanitary measures to ensure the protection of personnel, population and environment against the harmful impact of RW by the deep geological disposal, as well as contain the guidelines to organize the control by the operation and conservation of the storage facilities and monitoring of environment.

E.2.1.3.2. Federal Norms and Rules of Nuclear and Radiation Safety (Technical Aspects)

Federal norms and rules valid in the field of use of atomic energy are elaborated on the basis of normative legal Acts of Russian Federation, the Convention on nuclear safety, the Joint Convention on the safety of spent fuel management and the safety of radioactive waste management, taking into account the recommendations of the international organizations acting in the field of use of atomic energy, in whose work Russian Federation takes part.

According to the Ordinance of Government of Russian Federation № 717 of 13.09.2010 Ros-technadzor has the right to adopt independently the normative legal Acts within the established area including the Federal norms and rules in the field of use of atomic energy according to the legislation of Russian Federation.

The order of the elaboration of norms and rules in the field of use of atomic energy envisages the preliminary publication and the final publication of the projects of the mentioned rules and norms in the official body, excluding norms and rules in the field of use of atomic energy, which are the State secret, as well as the possibility to discuss these projects.

After the enactment these norms and rules are obligatory for all persons, carrying out their activity in the field of use of atomic energy, and are valid in the whole territory of Russian Federation.

Federal norms and norms are elaborated in a form of general provisions, norms, rules (requirements).

General provisions establish principles, criteria and general requirements of nuclear and radiation safety for an object of use of atomic energy (nuclear power plants, objects of NFC,

radiation sources, storage facilities for nuclear materials and radioactive wastes, research facilities etc) in general at all stages of its life cycle (location, construction, commissioning, operation and decommissioning, including by the accidents and elimination of their consequences, as well as by the SNF and RW management). Documents such as NP-001-97, NP-016-05, NP-038-11, NP-033-01 and others pertain to this category.

Norms and rules (requirements) establish requirements for either a certain type of activity or for some parts, systems and components of the object of use of atomic energy.

Safety issues specific for SNF reprocessing facilities are regulated by the FNR (Federal norms and rules) «**Facilities for Reprocessing of Spent Nuclear Fuel. Safety requirements (NP-013-99)**», which establish principles, criteria and requirements aimed to ensure safety by the design, construction and operation of SNF reprocessing facilities (SNF of power and research reactors and propulsion units of transport vehicles).

Safety issues specific for SNF dry storage facilities are regulated by the FNR «**Spent Nuclear Fuel Dry Storage Facilities. Safety requirements (NP-035-02)**», which establish safety requirements for design, construction, commissioning, operation and decommissioning of SNF dry storage facilities, located at the enterprises of NFC.

Requirements to take into account the external impacts of the natural and man-induced origin by the location, design, construction, operation and decommissioning of the objects of use of atomic energy are established by the FNR «**Taking into Account of External Natural and Man-induced Impacts on the Objects of Use of Atomic Energy (NP-064-05)**», which regulate natural and man-induced processes, phenomena and factors to be revealed by surveys and studies in the area around and on the site of object of use of atomic energy and to be taken into account by the substantiation of stability and safety of this object.

Requirements for quality assurance program establish requirements for structure and contents of programs ensuring quality for nuclear facilities, radiation sources, SNF and RW storage and processing facilities at all stages of life cycle (NP-011-99, NP-041-02, NP-056-04 and others).

Provisions on procedures for investigation and accounting of violations (NP-004-08, NP-047-11 etc) define the procedure for investigation and accounting of violations in the work of objects of use of atomic energy, the categories of these violations, contents of information and procedure of transmission of the information about these violations, as well as the requirements to the accounting of the investigation of violations.

Requirements for contents of the Plan of actions for personnel emergency protection (NP-015-2000, NP-077-06 etc) for different nuclear facilities, radiation sources and storage facilities establish main requirements for drafting of the Plans of actions for protection of the personnel in the case of an accident, the procedure for implementation of these Plans of actions, measures to protect the personnel in the case of an accident, actions of the operating personnel and facility administration if normal operational regime of the facility is violated, and determine how the work to eliminate the consequences of emergencies should be organized.

Requirements for substantiation of possible extension of the prescribed lifetime of objects of use of atomic energy (NP-024-2000) establish the main criteria and requirements of safety as regards a possibility to extend a lifetime of the objects of use of atomic energy (excluding NPP units and objects of use of atomic energy used for military

purposes) beyond the prescribed operating period and to obtain the license for operation for the additional period.

Main requirements for extension of a lifetime of NPP unit (NP-017-2000) establish the main criteria and requirements to the evaluation of the possibility of the extension of a lifetime of a NPP unit and to the measures to ensure safety in the additional period of operation.

Safety rules by the decommissioning of nuclear facilities (NP-057-04, NP-012-99, NP-028-01 etc) establish requirements to ensure safety during decommissioning of nuclear facilities, radiation sources, storage facilities, as well as to the program of their decommissioning, comprehensive engineering and radiation inspection and to the decommissioning project itself.

Safety by the management of RW are regulated by a series of Federal norms and rules, **elaborated taking into account the recommendations of ICRP and OECD, as well as IAEA standards in the field of RW management (including Safety Series N°111-F «The Principles of Radioactive Wastes Management» and N°WS-G-1.2 «Management of Radioactive Waste from the Mining and Milling of Ores», N° WS-R-1 «Near Surface Disposal of Radioactive Waste» and others).**

«Safety by the Management of the Radioactive Wastes. General provisions (NP-058-04)» establishes the aims and the principles to ensure safety by the RW management, as well as the general requirements to ensure safety.

Principles to ensure safety by the RW management established by this document include:

- to ensure the acceptable level of protection of workers (personnel) and population against radiation impact from RW in accordance with principles of substantiation, dose limitation and optimization (the principle of protection of human health);
- to ensure the acceptable level of protection of the environment against the harmful RW impact (the principle of protection of environment);
- to take into account interdependencies among stages of RW generation and RW management (the principle of interdependency among stages of RW generation and RW management);
- projected exposure levels of the future generations caused by the RW disposals should not exceed permissible exposure levels of the population established by the valid normative documents (the principle of protection of future generations);
- to avoid imposing of unjustified burdens on future generations connected with the necessity to ensure safety by the RW management (the principle of avoiding the excessive burden imposed on future generations);
- RW generation and accumulation should be kept at the minimum practically achieved level (the principle of control over RW generation and accumulation);
- to prevent the accidents with the radiation consequences and mitigation of possible consequences if such accidents have taken place.

«Safety Rules for Management of Radioactive Wastes of Nuclear Power Plants (NP-002-04)» establish safety principles and requirements for management of RW of NPPs.

Norms and rules NP-019-2000, NP-020-2000, NP-021-2000 establish requirements to ensure safety by the collection, reprocessing, storage and conditioning of liquid, solid and gaseous radioactive wastes, correspondingly, at nuclear facilities, radiation sources, storage

facilities of nuclear materials and radioactive substances (NF, RS, SF for NM and RS), and RW storage facilities.

«**Disposal of Radioactive Wastes. Principles, criteria and main safety requirements (NP-055-04)**» establishes principles, criteria and main safety requirements by the near-surface RW disposal and by the RW disposal in deep geological formations.

«**Near-surface Disposal of Radioactive Wastes. Safety requirements (NP-069-06)**» develops and concretizes the requirements of Federal norms and rules NP-058-04 and NP-055-04 regarding safety achievement by the near-surface disposal of RW.

«**Rules of Assignment of Nuclear Materials to the Category of Radioactive Wastes**» (NP-072-06) establish the requirements to the set of measures to assign to the category of RW the materials not subject for the further use; to the withdrawal of the nuclear materials, which they contain, from the State accounting, and to the setting of the RW formed from these products and containing nuclear materials to the State accounting.

In Russian Federation the normative legal basis for safety regulation of the implementation of **cross-border transportations** of nuclear materials (including SNF), radioactive substances and RW are the Federal norms and rules, elaborated on the base of International Codes for transportation of the hazardous goods (IMDG, ICAO, RID, ADR) (Annex E).

«**Safety Rules by the Transportation and Storage of Radioactive Materials**» (NP-053-04 and NP-061-05) establish main technical and organizational requirements for systems of storage and transportation of nuclear materials, RS and RW, including SNF, aimed to ensure safety during the storage and transportation of nuclear materials, RS and RW at the objects of use of atomic energy.

Requirements for Contents of Safety Analysis Reports (OOB) for the WWER reactors, for the BN reactors, research nuclear facilities, facilities of NFC, marine nuclear propulsion units, storage facilities for nuclear materials and radiation sources (NP-006-98, NP-018-05, NP-049-03, NP-051-04, NP-023-2000, NP-066-05, NP-039-02) establish volume and quality of the information, which must ensure the possibility to evaluate the appropriateness of the technical solutions and technical and organizational measures used to ensure safety of nuclear facilities and their compliance with the requirements of normative documents for safety. The requirements of the above-mentioned documents concern the new located, designed, constructed and decommissioned nuclear facilities. The contents of OOB are corrected in the appropriate order and must reflect the actual status of nuclear facilities as a result of the construction, reconstruction and upgrade, introduction of the changes in the project, changes of the circumfluent conditions which may influence safety, changes of the valid legislative Acts and normative documents for the safety of nuclear facilities.

The valid system of the Federal norms and rules ensured the possibility of the elaboration of national program of safety evaluation for Russian NPPs after the emergency at Fukushima-1 NPP.

Visiting Russia in 2009 IAEA mission for comprehensive evaluation of activity of State safety regulatory authorities (Integrated regulatory review service IAEA mission (IRRS)) has noticed as a positive practices of Russian Federation the wide use of IAEA standards by the elaboration of national Federal norms and rules and safety guidelines.

After the presentation of Second National Report has been elaborated a series of new Federal norms and rules in order to provide the compliance of the normative requirements being established with the achieved level of science and technology and taking into account of both Russian and foreign experience in the field of use of atomic energy (s. Annex E).

The changes of policy and practices by the RW management, first of all elaboration and approval of Federal Law «On the Radioactive Wastes Management and on the Changes in Some Legislative Acts of Russian Federation» in 2011 have required the change of the normative base in the field of use of atomic energy. At the present time is elaborated new project of Federal norms and rules in the field of RW management entitled «Requirements to the acceptability criteria to dispose the radioactive wastes», as well as the proposals to introduce changes in the following Federal norms and rules:

- NP-058-04 «Safety by the management of the radioactive wastes. General provisions»;
- NP-055-04 «Disposal of the radioactive wastes. Principles, criteria and the main safety requirements»;
- NP-069-06 «Near-surface disposal of the radioactive wastes. Safety requirements».

By the amendment of the documents are also taken into account the provisions of the following IAEA documents: SF-1 Fundamental Safety Principles. (2007), GSR Part 4. Safety Assessment for Facilities and Activities (2009) and GSR Part 5. Pre-disposal Management of Radioactive Waste (2009) as well as safety series SSR-5. Disposal of Radioactive Waste (2011).

The main changes and proposals concern, primarily, the classification of RW in order to dispose them and to define the acceptability criteria of RW for disposal.

The list of the valid and new Federal norms and rules, elaborated after the presentation of the Second National Report of Russian Federation is given in the Annex E.

E.2.1.4. Guiding Documents and Safety Guides of Rostekhnadzor

Guiding documents contain organizational norms which establish rules and procedures for one or other activity under the jurisdiction of Rostekhnadzor.

In particular, guiding documents define requirements for the structure of documents required to substantiate nuclear and radiation safety of nuclear facilities, radiation sources and SNF and RW storage facilities; the requirements for their contents; procedure for verification of authenticity of data contained in the documents submitted for licensing; as well as the procedure for organization of nuclear and radiation safety expert examination.

According to the «Procedure of elaboration and approval of administrative regulations for implementation of State competences and of administrative regulations to provide State services» approved by the Ordinance of the Government of Russian Federation № 679 of 11.11.2005, since 2008 have been approved the corresponding administrative regulations of Rostekhnadzor.

Safety guidelines (guides) (actually Provisions) establish acceptable for Rostekhnadzor ways and methods to comply with requirements of Federal norms and rules and determine required sequence of actions and conditions to carry out such actions. Provisions to regulate the safety of objects of use of atomic energy are the facultative Acts, which are not normative legal Acts. Provisions contain recommendations of Federal environmental, industrial and nuclear supervision service:

- Recommendations to prepare documents, substantiating safety of objects of use of atomic energy and any types of activity on these objects;
- Recommendations of methods to evaluate documents, substantiating safety of objects of use of atomic energy and any types of activity on these objects;
- Recommendations about the structure, contents and tendencies of the scientific works, substantiating safety of objects of use of atomic energy and any types of activity on these objects;

- Other recommendations, aimed to regulate nuclear and radiation safety of objects of use of atomic energy and any types of activity on these objects;

The list of safety guidelines elaborated and put into force by the Federal environmental, industrial and nuclear supervision service is given in the Annex E to this Report.

E.2.2. Licensing of Spent Nuclear Fuel and Radioactive Waste Management (Article 19-2(II, III))

According to the Article 26 of the Federal Law «On the Use of Atomic Energy» is established that any activity in the field of use of atomic energy, subject to licensing by the State safety regulatory authorities is prohibited if there is no license to carry it out.

According to the Article 14.1 of «Code of Russian Federation on Administrative Violations» № 195-FL of 30.12.2001 the implementation of the activity without a license, if such license is mandatory, brings to an administrative fine to be imposed on citizens.

According to the Article 171 of the Criminal Code of Russian Federation is envisaged the criminal punishment for the implementation of the activity without a license, if such license is mandatory.

The procedure and conditions for licensing of the activity in the field of use of atomic energy are established by the «Provision for licensing of activities in the field of use of atomic energy» (approved by Ordinance of the Government of Russian Federation № 865 of 14.07.1997).

A list of activities related to this Convention includes:

- location, construction, operation and decommissioning of nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances and RW storage facilities;
- management of nuclear materials and radioactive substances, including during exploration and mining of uranium ores, production, use, reprocessing, transportation and storage of nuclear materials and radioactive substances;
- management of radioactive wastes during their storage, reprocessing, transportation and disposal;
- the use of nuclear material and/or radioactive substances by research and development;
- design and construction of nuclear facilities, radiation sources and storage facilities for nuclear materials and radioactive substances and RW storage facilities;
- construction and manufacture of the equipment for nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances and RW storage facilities;
- expert examination of the design documentation, engineering and technological documentation and the documents which substantiate nuclear and radiation safety of nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances and RW storage facilities as well as activities related to the management of nuclear materials, radioactive substances and radioactive wastes.

According to the Provision «On the Federal environmental, industrial and nuclear supervision service» (approved by Ordinance of the Government of Russian Federation № 401 of 30.07.2004) the licensing of the activity in the field of use of atomic energy is executed by the Federal environmental, industrial and nuclear supervision service (Rostechndzor).

The procedure of the implementation by Rostekhnadzor of the State function for licensing of activity in the field of use of atomic energy has been established by the «Administrative regulations for implementation of the State function for licensing of the activity in the field of use of atomic energy by the Federal environmental, industrial and nuclear supervision service», approved by the Ministry of Natural Resources and Environment of Russian Federation in the order № 262 of 16.10.2008 (further Administrative Regulations).

In the Administrative regulations are established the requirements to the procedure of the implementation of the State function for licensing of activity, administrative procedures, delimitations of competences between the central authorities of Rostekhnadzor and its territorial authorities by the implementation of the State function for licensing, maximum terms of the expert examination of documents, submitted to obtain the license, as well as the requirements to the composition of the set of documents, substantiating nuclear and radiation safety by the location, construction, operation and decommissioning (closure) of nuclear facilities, sources of radiation and storage facilities.

While reviewing the application for licensing any activity in the field of use of atomic energy Rostekhnadzor organizes and carries out an inspection of the applicant's readiness to execute this type of activity and a verification of the authenticity of information presented in the documents substantiating safety. The decision to grant a license or to refuse to do it is made taking into account the results of the executed inspection.

By the review of the set of documents, substantiating achievement of nuclear and radiation safety of nuclear facilities, sources of radiation and storage facilities and/or of declared type of activity, Rostekhnadzor analyzes:

- compliance of the design, engineering and technological solutions with Federal norms and rules in the field of use of atomic energy, compliance of competence of workers with the established requirements and availability of conditions to maintain it at the proper level, as well as availability of the systems of RW collection, storage, reprocessing and disposal and compliance of these systems with the established requirements during the implementation of the declared activity;
- completeness of technical and organizational measures to ensure nuclear and radiation safety by the implementation of declared activity;
- availability of the adequate conditions for storage and organization of accounting and control of nuclear materials, radioactive substances and RW, achievement of the physical protection of nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances, RW storage facilities;
- Plans of actions to protect workers of the object of use of atomic energy and population in the case of an accident and preparedness to implement them, as well as the quality assurance system and availability of the necessary engineering and technical support of the declared activity;
- ability of the applicant to ensure conditions for the safe cessation of the declared activity and decommission the object of use of atomic energy, as well as availability of the appropriate design materials.

According to the Annex to the Administrative regulations granting of the licenses for location, construction, operation and decommissioning of the facilities, which have regional importance and aimed for RW storage, or licenses for the RW management, is subject to the competence of interregional territorial authorities of Rostekhnadzor. Licensing of the activity for location, construction, operation and decommissioning of the SNF storage facilities and

facilities aimed for RW storage, which have interregional importance, as well as RW disposal facilities (independently upon the status of disposal facility) is carried out by the central authorities of Rostechнадзор.

The positive statement of the State ecological expert examination as well as the availability of sanitary and epidemiologic statement issued by the authorities of sanitary and epidemiologic supervision are mandatory conditions to obtain the license for SNF and RW management.

If any circumstances unknown earlier and related to safety of the activity being licensed are revealed or new Federal norms and rules valid in the field of use of atomic energy are put into force, Rostechнадзор may require from the applicant to present additional documents substantiating safety of the activity being licensed and make a decision to amend the license conditions.

E.2.3. System of Institutional and Regulatory Control, Documentation and Reporting (Accounting) (Article 19-2 (IV))

E.2.3.1. Institutional Control

The institutional control over SNF and RW management, registration of documentation and accounting are carried out in accordance with the allocation of the responsibilities between the State executive authorities and operating organization.

Herewith the common functions are:

- planning, organization and implementation of inspections;
- elaboration of the industry-wide norms, rules and safety requirements;
- analysis of plans, discrepancies and violations; elaboration of recommendations;
- organization of granting permits and participation in it;
- organization of training and attestation of the personnel;
- implementation of research and development works and introduction of their results.

According to the Article 35 of the Federal Law «On the Use of Atomic Energy», the operating organization elaborates and implements the measures to control safety of nuclear facilities, radiation sources or storage facilities.

Conditions of the license granted by the authority regulating safety establish that the operating organization must take corresponding measures so that the control, inspections and tests of equipment and systems important for safety would be carried out in accordance with the established procedures and schedules.

If the operating organization fails to ensure safety of the mentioned objects, the competent Federal authority administering in the field of use of atomic energy is made responsible for safety and proper management until a new operating organization is determined.

E.2.3.2. Regulatory Control

The State supervision over safety of the use of atomic energy means activity of the competent State authorities regulating safety and of their regional bodies, which includes acquisition and analysis of information related to safety, organization and implementation of inspections, decision-making, and imposing of sanctions if violations of safety requirements for the use of atomic energy are revealed. In accordance with its competences Rostechнадзор has approved and put into force the «Provisions for organization of state supervision over safety by the use of atomic Energy» (RD-03-43-98), as well as other guiding documents of Ros-

technadzor, which determine the procedures to carry out the inspections and scope of issues reviewed during the inspections.

According to the Ordinance of the Government of Russian Federation № 401 Rostekhnadzor controls and supervises over:

- compliance with the norms and rules in the field of use of atomic energy;
- compliance with conditions of licenses granting the right to carry out works in the field of use of atomic energy;
- nuclear, radiation, technical and fire safety (at the objects of use of atomic energy);
- physical protection of nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances, systems for the State control and accounting of nuclear materials, radioactive substances and RW.

In the regional bodies (authorities) of Rostekhnadzor have been made the divisions – inspection offices – which supervise over activity in the field of use of atomic energy in the organizations and at the enterprises of nuclear industry. These divisions are staffed with inspectors having the appropriate specialties and necessary authority and regularly carry out the State supervision over safety of all nuclear facilities, radiation sources and SNF and RW storage facilities.

Annually, Rostekhnadzor compiles plans to carry out the inspections both by the representatives of regional authorities (special-purpose, operative) and by representatives of the central headquarters of Rostekhnadzor (comprehensive and special-purpose).

The sanitary and epidemiologic supervision authorities control over the compliance with the sanitary and hygienic norms and rules, including those in the field of radiation safety. The above-mentioned authorities issue statements about the compliance of SNF and RW management facilities or transporting vehicles with the requirements of sanitary norms and rules.

According to the Article 3 of the Federal Law «On the Use of Atomic Energy» objects, containing or using nuclear materials and radioactive substances in quantities and with the activity (and /or emitting ionizing radiation with the intensity and energy) less than the values established by the Federal norms and rules valid in the field of use of atomic energy are not subject to the law, correspondingly they are exempted from the sphere of safety regulation in the field of use of atomic energy.

The procedure and criteria for exemption of an activity from the regulatory control are regulated by the norms of radiation safety NRB-99/2009 and by the sanitary rules OSPORB 99/2010.

It has been established that the requirements of norms and rules are not valid for sources of radiation (and corresponding activity) creating by any conditions of their management:

- individual annual effective dose not more than 10 mSv;
- collective annual effective dose not more than 1 man • Sv, or when by the collective dose more than 1 man • Sv the evaluation according to the principle of optimization shows inexpediency of reduction of collective dose;
- individual annual effective dose in skin not more than 50 mSv and in the eye's crystalline lens not more than 15 mSv.

In the point 3.11.3 of sanitary rules OSPORB-99 valid until 26.04.2010 was established that there are no limitations on use of any solid materials, raw materials and articles with the specific activity of radionuclides in them less than 0,3 kBq/kg in the economical purposes. In

accordance with the federal authority having competence to carry out the State sanitary and epidemiological supervision for some beta emitting radionuclides may be established higher values of specific activity of raw materials, materials and articles appropriate for unlimited use.

In the sanitary rules OSPORB-99/2010 have been introduced new criteria for exemption of materials from the regulatory control, which are valid for all materials –solid, liquid and gaseous. According to the point 3.11.3 of sanitary rules OSPORB-99/2010 are introduced no limitations for use in the economical purposes of any materials, raw materials and articles with the specific activity of man-induced radionuclides in them less than values, shown in Annex 3 of OSPORB-99/2010.

In practice the exemption of the substances in the liquid and gaseous state from the regulatory control on the basis of the values, shown in Annex 3 of OSPORB-99/2010 is not carried out at the present time. According to the rules of the State control and accounting of radioactive substances and RW such substances are subject to the accounting as radioactive wastes with the corresponding requirements for their management.

E.2.3.3. Documentation and Reporting (Accounting)

According to the Federal Law «On the Use of Atomic Energy» and Federal norms and rules valid in the field of use of atomic energy the operating organization must ensure the preparation and presentation of the periodical reports with the state of safety of the object of use of atomic energy to the State authority regulating safety by the use of atomic energy and to the State authority, which administers the use of atomic energy. It includes information about:

- provision of the nuclear and radiation safety; discharges and releases of radioactive substances, SNF and RW management;
- preparation of the personnel and its admission to work;
- emergency preparedness;
- violations of the normal operation and their consequences.

Information about the violations must contain analysis, investigating the causes and the conditions of the occurred violations of the requirements to ensure safety and data of the efficiency of the measures taken by the operating organizations to prevent the violations of the requirements to ensure safety, as well as the analysis of the causes and conditions evoking these violations.

The order of the presentation of the information about the violations in the work and the reports about the state of safety on the objects of use of atomic energy to Rostekhnadzor and to its territorial authorities is established by Rostekhnadzor.

All obtained information and the reports with the state of safety of objects of use of atomic energy are subject to registration and processing in the corresponding divisions of the central headquarters of Rostekhnadzor and its territorial authorities.

The procedure of processing and analysis of information, the goals of analysis and concrete measures, taken according to its results, are established by the guiding documents of Rostekhnadzor.

The operating organization must ensure the storage of the design documentation, documentation about the construction, maintenance and reparation of systems (elements) important for safety, as well as storage of materials of investigations of the violations in the work during all the lifetime of object of use of atomic energy.

In the case of change of design, engineering, technological and operational documentation, which influences on the provision of nuclear and radiation safety, the corresponding materials regarding changes, which lead to the correction of the license conditions, together with the corrected documents substantiating safety (reports, additions to reports and so on) obligatorily are presented by the licensee (operating organization) to Rostekhnadzor in order to organize their review and to make decision to introduce necessary changes in the license conditions.

E.2.4. Enforcement of Applicable Regulations and of the Terms of Licenses (Article 19-2(v))

According to the Federal Law «On the Use of Atomic Energy» the State authorities regulating safety within the scope of their competences have the right to use the measures of administrative enforcement in the order established by the legislation of Russian Federation.

According to the Ordinance of the Government of Russian Federation № 865 of 14.07.1997 Rostekhnadzor carries out the State supervision over the compliance of the licensee with the license conditions and, if they are not complied with, imposes sanctions established by the legislation of Russian Federation.

According the valid legislation of Russian Federation and according to the Provision on the Federal environmental, industrial and nuclear supervision service its officials have the right to take the following measures of the administrative enforcement (sanctions):

- to suspend or cease the validity of licenses issued by Rostekhnadzor and its territorial authorities to organizations (legal entities) for declared types of activity in the field of use of atomic energy, if they carry out such activities with the violations of the requirements for nuclear and radiation safety or conditions of these licenses;
- to prohibit the use of equipment and technologies, which do not comply with requirements for nuclear and radiation safety;
- to issue the prescriptions for elimination of the revealed violations of Federal norms and rules, as well as the prescriptions for disqualification of personnel according to the Code of the administrative violations;
- to impose the administrative penalties in form of warnings and fines on organizations (legal entities) and on facilities officials for violations of norms and rules valid in the field of use of atomic energy;
- to submit to the law enforcement authorities the materials about the violations of the legislation of Russian Federation in the field of use of atomic energy, requirements of Federal norms and rules in the field of use of atomic energy, license (permit) conditions, which have elements of crime according to the criminal legislation of Russian Federation.

Rostekhnadzor may deprive the licensee of the right to carry out the activity shown in license, suspending the license validity or canceling it in the following cases:

- the violation by the licensee of federal laws or other normative legal Acts of Russian Federation valid in the field of use of atomic energy;
- the detection of the incorrect information in the documents submitted to get the license;
- the violation of the license conditions by the licensee;
- the failure to implement the prescription of Rostekhnadzor or other State authorities regulating safety by the licensee;

- the failure of licensee to comply with the prescriptions or ordinances of the State authorities or with the prescription for suspension of the activity of licensee issued by these authorities according to the legislation of Russian Federation;

The Code on administrative violations of Russian Federation envisages the imposition of the administrative fine on citizens, officials and legal entities in the case of disobedience to the legal prescription or demand of the official of the State supervision authority or prevention to this official to fulfill his duties, as well as in the case of execution of the activity with the violation of the license conditions. The Code also envisages the administrative suspension of the activity for the time up to 90 days in the case of a threat to the life or health of people, occurrence of the radiation accident or man-induced disaster, substantial damage to the environment.

E.2.5. Division of Responsibilities of the Bodies (Authorities) Involved at Different Stages of Spent Nuclear Fuel and Radioactive Waste Management (Article 19-2(VI))

The principles of legal regulation in the field of use of atomic energy have been established by the Federal Law «On the Use of Atomic Energy». The law defines competence, rights and authorities of different parts of legal regulation in the field of use of atomic energy and establishes the responsibilities and obligations of the operating organization to ensure safety of a nuclear facility, source of radiation and storage facility.

According to the provisions of the Federal Law «On the Use of Atomic Energy» the competence of authorities administering the use of atomic energy inter alia includes:

- implementation of the State scientific, technical, investment and organizational policy in the field of use of atomic energy;
- elaboration of the measures to ensure safety by the use of atomic energy;
- creation and implementation of RW management programs.

The Ordinance of the Government of Russian Federation № 412 of 03.07.2006 « On the Federal executive authorities and authorized organizations, exercising the state administration of the use of atomic energy and state regulation of safety by the use of atomic energy» defines as the authorities of the State administration of use of atomic energy the following organizations:

- State Atomic Energy Corporation «Rosatom» (Rosatom);
- Ministry of industry and trade of Russian Federation (Minpromtorg of Russia);
- Ministry of public health and social development of Russian Federation (Minzdravsocrazvitiya of Russia);
- Ministry of regional development of Russian Federation (Minregion of Russia) (in the part concerning management of RW with low-level and intermediate-level activity and the sources of ionizing radiation, which don't pertain to the nuclear, power and military complexes of the country);
- Ministry of energy of Russian Federation (Minenergo of Russia);
- Ministry of education and science of Russian Federation (Minobrnauki of Russia);
- Federal agency for subsoil management (Rosnedra);
- Federal agency for technical regulation and metrology (Rosstandart);
- Federal agency for marine and river transport (Rosmorrechflot);
- Federal medical and biological agency (FMBA of Russia).

In the decision-making concerning creation of the facilities, reprocessing SNF and RW, as well as SNF and RW storage facilities take part also the State authorities of the subjects of Russian Federation.

The Federal Law «On the Management of Radioactive Wastes and on the Changes of Some Legislative Acts of Russian Federation» regulates the status and competences of different participants in the activities of RW management, establishes the right of ownership on RW and RW storage facilities, as well as the procedure of the transfer of rights from one participant to another.

E.3. State Safety Regulation by the Use of Atomic Energy (Article 20)

Article 20. Regulatory Authorities

20-1 Each Contracting Party shall establish or designate a regulatory authority entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfill the responsibilities assigned to it.

20-2 Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions in the cases when organizations are involved in both spent fuel or radioactive waste management and in their regulation.

E.3.1. Regulatory Bodies (Authorities) (Article 20.1)

Article 20. Regulatory authorities

20-1 Each Contracting Party shall establish or designate a regulatory authority entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfill the responsibilities assigned to it.

The Federal Law «On the Use of Atomic Energy» established that the State regulation of safety by the use of atomic energy provides for the activity of the corresponding Federal State executive authorities aimed to organize of the elaboration, approval and introduction of norms and rules in the field of use of atomic energy, granting of the permissions (licenses) giving right to carry out works in the field of use of atomic energy, the implementation of the supervision over the safety, execution of expert examination and inspection, control over elaboration and realization of measures for protection of workers of objects of use of atomic energy, population and environment in the case of accident by the use of atomic energy.

The article 24 of the law establishes, that the State regulation of safety by the use of atomic energy is carried out by the Federal executive authorities – State authorities regulating safety, which carry out the regulation of nuclear, radiation, technical and fire safety.

By the Ordinance of the Government of Russian Federation № 412 of 03.07.2006 has been established that the State regulation of safety by the use of atomic energy is carried out by:

- Federal environmental, industrial and nuclear supervision service (Rostekhnadzor);
- Ministry for civil defense, emergencies and elimination of consequences of natural disasters (MChS of Russia) of Russian Federation;
- Ministry of natural resources and environment of Russian Federation (Minprirody);
- Federal service on supervision in sphere of wildlife management (Rosprirodnadzor);

- Federal service customers' rights protection and human well-being surveillance (Rosspotrebnadzor)
- Federal medical and biological agency (FMBA of Russia).

In 2007 after the approval of the Federal Law «On the State Atomic Energy Corporation «Rosatom»» in the article 23 of the Federal Law «On the Use of Atomic Energy» has been introduced the change, according to which the State regulation of safety by the use of atomic energy envisages also the activity of Rosatom.

The competences of State authorities regulating safety are established by the article 25 of Federal Law «On the Use of Atomic Energy».

The competence, structure and human resources of the State authorities regulating safety have been defined by the corresponding Ordinances of the Government of Russian Federation.

The volumes of the budget financing of the activity of State authorities regulating safety are approved By the State Duma of Russian Federation and the Federation Council of Russian Federation within the frames of budget of Russian Federation for the current year.

Federal Environmental, Industrial and Nuclear Supervision Service

Federal environmental, industrial and nuclear supervision service (Rostekhnadzor) is the Federal executive authority, which carries out functions of the State regulation of safety in the field of use of atomic energy and regulating authority according to the Convention on nuclear safety and the Joint Convention on safety of SNF and RW management, as well it is a competent authority of Russian Federation according to the Amendment to the Convention on the physical protection of nuclear material. In the «Provision about the Federal environmental, industrial and nuclear supervision service» № 401 of 30.07.2004 (further – Provision) have been introduced the corresponding changes by the Ordinance of the Government of Russian Federation № 717 of 13.09.2010.

According to the Provision Rostekhnadzor carries out the following main authorities in the field of use of atomic energy:

- presents to the Government of Russian Federation projects of federal laws, normative legal Acts of the President of Russian Federation and the Government of Russian Federation;
- approves independently the following normative legal Acts in the sphere under its competence:
 - ♦ Federal norms and rules in the field of use of atomic energy according to the legislation of Russian Federation;
 - ♦ procedure of granting permissions to the workers of the objects of use of atomic energy to carry out works in the field of use of atomic energy;
 - ♦ requirements to the structure and contents of the documents, substantiating provision of safety of nuclear facilities, sources of radiation, storage facilities and (or) of safety the activities carried out in the field of use of atomic energy, which documents are necessary for licensing of the activity in this field; as well as the procedure for implementation of the expert examination of the above-mentioned documents;
 - ♦ order of the organization and implementation of the supervision over system of the State control and accounting of nuclear materials;
 - ♦ order of the compilation and running of the files necessary by the execution of the State building supervision, as well as the requirements to the documentation included in such files;

- ♦ Codes of the rules according to the legislation of Russian Federation concerning technical regulation;
- ♦ methodological drafts and introduction of normative standards setting the minimum permissible releases of radioactive substances in the atmospheric air and the normative standards setting minimum permissible discharges of the radioactive substances in the water objects;
- ♦ procedure of granting of permissions and form of permissions for releases and discharges of radioactive substances;
- ♦ carries out control and supervision over:
 - ♦ observation of norms and rules in the field of use of atomic energy, of conditions of validity of licenses (permissions) giving right to implement works in the field of use of atomic energy;
 - ♦ nuclear, radiation, technical and fire safety (on the objects of use of atomic energy);
 - ♦ physical protection of nuclear facilities, sources of radiation, storage facilities for nuclear materials and radioactive substances, as well as of systems of unified State control and accounting of nuclear materials, radioactive substances and radioactive wastes;
 - ♦ observation of the international obligations of Russian Federation in the field of safety achievement by the use of atomic energy;
 - ♦ observation of the requirements of the legislation of Russian Federation in the field of RW management within the scope of its competence;
 - ♦ timely restitution of the irradiated fuel assemblies of nuclear reactors as well as the products of their reprocessing to the country producer, with which Russian Federation has made the international agreement;
 - ♦ observation of the requirements of technical regulations in the sphere under its competence;
- implements according to the legislation of Russian Federation licensing of activity in the field of use of atomic energy;
- grants the permissions for:
 - the right to carry out the works in the field of use of atomic energy to the workers of the objects of use of atomic energy;
- releases and discharges of the radioactive substances into the environment;
 - ♦ establishes normative standards of minimum permissible releases of radioactive substances in the atmospheric air and normative standards of minimum permissible discharges of radioactive substances in the water objects;
 - ♦ in the sphere under its competence carries out verifications (inspections) of the observation of the requirements of legislation of Russian Federation, normative legal Acts, norms and rules by the legal entities and physical persons;
 - ♦ coordinates:
- qualification guides for the posts of leading managers and specialists (employees), in which are determined the qualifying requirements to the workers obtaining permissions to carry out works in the field of use of atomic energy;
- the lists of radioisotope production, whose importation and exportation doesn't demand any licenses;
 - ♦ organizes and guarantees functioning of the system of control over the objects of use of atomic energy in emergency cases;

- ♦ creates, develops and supports functioning of the automated system of informational and analytical service, appropriate inter alia for the purposes of unified State automated system of control over the radiation status in the territory of Russian Federation;
- ♦ issues statements about the compliance of the constructed, reconstructed, repaired object of the capital construction with the requirements of the technical regulation and design documentation.

In its activity Rostechнадзор uses the quality assurance system according to the requirements of «Provision on the quality system of Federal environmental, industrial and nuclear supervision service in the field of State safety regulation by the use of atomic energy» (RD-03-29-2008), which is aimed to ensure quality and efficiency of implementation by Rostechнадзор of functions for State regulation of safety by the use of atomic energy. The quality (assurance) system of Rostechнадзор takes into account the provisions of international standards ISO of series 9000 and IAEA recommendations.

Implementation of the functions imposed on Federal environmental, industrial and nuclear supervision service is provided by the central headquarters and interregional territorial authorities for supervision of nuclear and radiation safety formed in accordance with established procedure. The structure of the central headquarters and territorial authorities of Rostechнадзор with indication of personnel numbers is given on site <http://www.gosnadzor.ru>.

The central headquarters and interregional territorial authorities of Rostechнадзор for supervision of nuclear and radiation safety are staffed with the personnel having necessary qualification, which is subject to the requirements set forth by the Federal Law № 79-FL of 27.07.2004 «On the State Civil Service», by the decree of the President of Russian Federation № 1131 of 27.09.2005 and by other normative Acts.

The procedure of professional training of specialists of Rostechнадзор is defined according to the document RD-20-06-2008 «Provision for the organization of professional preparation of personnel of the Federal environmental, industrial and nuclear supervision service».

The support of the qualification of the State employees of Rostechнадзор is carried out in the planned manner within the scope of the existing system of professional development, which includes:

- Additional professional educational programs, extension courses;
- Educational institutions, which insure necessary contents and quality of the additional professional education for State employees;
- Structural subdivisions of Rostechнадзор, which administer the system of professional development of personnel.

Rostechнадзор periodically prepares and publishes the reports about the activity of the service, which contain information with the status of activities in control, supervision, licensing and granting of permissions, analysis of safety and stability against emergencies of the production activities and objects under control, including analysis of the negative man-induced impact on the environment and the results of expert activity. The reports also contain the information about the violations in the work of the objects under control, including the objects, which carry out the activities connected with RW and SNF management. These reports are situated on the open site of Rostechнадзор, are published in the theoretical and practical quarterly «Nuclear and radiation safety» (is published since 1998) and are within reach of the public.

In 2009 according to the agreement between IAEA and the Government of Russian Federation has been carried out the full-scale mission of IAEA in order to provide its services for comprehensive evaluation of the activity of the regulating authorities (IRRS). Within the scope of the mission the representatives of IAEA have evaluated the efficiency of the activity of State authorities regulating safety, including Rostekhnadzor by the use of atomic energy and compliance with the requirements of the international conventions and obligations, assumed by the Government of Russian Federation. According to the results of the work of IAEA mission in Rostekhnadzor has been elaborated and approved «Plan of actions», in which are formulated the concrete measurements to improve the State regulation of safety by the use of atomic energy. The planned terms of the realization of these measurements: 2011-2012 years.

Under the jurisdiction of Rostekhnadzor there are two organizations of technical support in the field of nuclear and radiation safety – Federal budget institution «Scientific and technical centre for nuclear and radiation safety» (FBI «SEC NRS») (<http://www.secnr.ru>) and Federal State Unitary Enterprise FSUE«VO Safety» (<http://vosafety.ru>), which carry out the scientific and technical support of the activity of Rostekhnadzor in the field of regulation of nuclear and radiation safety.

Federal Service on Customers' Rights Protection and Human Well-being Surveillance (Rospotrebnadzor) according to the Ordinance of the Government of Russian Federation № 322 of 30.06.2004 is the federal executive authority, which carries out the functions of State sanitary and epidemiological supervision over the observation of sanitary legislation.

Federal Medical and Biological Agency (FMBA of Russia) has been established by the Decree № 1304 of the President of Russian Federation of 11.10. 2004 entitled «On the Federal medical and biological agency» and created in order to develop the system of specialized sanitary and epidemiological supervision and medical and sanitary provision of the workers of organizations of some industry branches, operating in particularly hazardous working conditions.

According to the Ordinance of the Government of Russian Federation № 206 of 11.04.2005 have been established the competences of the Federal medical and biological agency; one of the priorities of the agency is implementation of the functions of control and supervision in the field of the sanitary and epidemiological well-being of personnel of organizations operating in some industry branches, which have particularly hazardous working conditions, as well as of the population of some territories.

One of the main directions of the activity of FMBA of Russia in the field of achievement of radiation safety is the State regulation of safety by the use of atomic energy. These competences are executed through the system of the State sanitary and epidemiological normative standardization regarding elaboration and approval of binding for the operating organizations sanitary rules and hygienic normative standards which are elaborated by the research organizations subject to FMBA of Russia.

The scientific institutions of FMBA of Russia implement the scientific support for the execution of radiation hazardous works, their medical and hygienic accompaniment and the expert examination in this field.

Its functions to implement the State sanitary and epidemiological supervision (control) FMBA of Russia carries out both per se and through its territorial authorities (interregional and regional departments).

Radiation control over the working conditions of personnel of the objects of use of atomic energy under control, including RW and SNF management, and over the status of radiation safety of the population in some territories is carried out by the industrial sanitary laboratories (radiation hygienic laboratories) and by the laboratories of internal dosimetry (inhouse radiation monitoring laboratories), which are the part of the centers for hygiene and epidemiology of FMBA of Russia.

According to the Ordinance of the Government of Russian Federation No 712 of 01.12.2005 the **Ministry of Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters** (MChS of Russia) carries out the State supervision in the field of the protection of population and territories against natural and man-induced emergencies.

Ministry of Natural Resources and Environment of Russian Federation (Minprirodi of Russia) according to the Ordinance of the Government of Russian Federation No 404 of 28.05.2008 carries out the functions of the elaboration of the State policy and normative and legal regulation in the field of study, use, regeneration, and protection of the natural resources, including the sphere of regulation of the radiation control and monitoring.

Federal Service on Supervision in Sphere of Wildlife Management (Rosprirodnadzor) according to the Ordinance of the Government of Russian Federation № 400 of 30.07.2004 carries out the functions of control and supervision in the field of the environmental protection (State ecological control) and of the State ecological expert examination.

E.3.2. Independence of Safety Regulatory Bodies (Authorities) (Article 20-2)

Article 20. Regulatory Authorities

20-2 Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions in the cases when organizations are involved in both spent fuel or radioactive wastes management and in their regulation.

According to the legislation of Russian Federation the State safety regulatory authorities are independent of other State authorities, as well as of organizations whose activities relate to the use of atomic energy, as established in the Article 24 of the Federal Law «On the Use of Atomic Energy».

The activities of the Federal environmental, industrial and nuclear supervision service since 2010 are administered directly by the Government of Russian Federation (Decree of the President of Russian Federation № 780 of 23.06.2010 «Issues of the Federal Environmental, Industrial and Nuclear Supervision Service»).

The activities of the Ministry for civil defense, emergencies and elimination of consequences of natural disasters of Russian Federation are administered by the President of Russian Federation (decree of the President of Russian Federation № 649 of 20.05.2004).

The activities of the Federal service on customers' rights protection and human well-being surveillance are administered by the Ministry of public health and social development of Russian Federation (decree of the President of Russian Federation № 649 of 20.05.2004).

The activities of the Federal medical and biological agency are administered by the Ministry of the public health and social development of Russian Federation (decree of the President of Russian Federation № 1304 of 11.10.2004).

The activities of the Ministry of natural resources and environment of Russian Federation are administered by the Government of Russian Federation (Decree of the President of Russian Federation № 649 of 20.05.2004).

The activities of the Federal service on supervision in sphere of wildlife management are administered by the Ministry of natural resources and environment of Russian Federation (decree of the President of Russian Federation № 649 of 20.05.2004).

According to the Federal Law «On the Use of Atomic Energy» the activities of the State safety regulatory authorities are financed by the federal budget.

Effective guaranteeing of the independence of the functions of the regulatory authorities and administrative authorities operating in the field of use of atomic energy is achieved by the following measures:

- distinct division of functions and competences of the administrative authorities and regulatory authorities on the legislative level;
- definition of the necessary size of staff for the central headquarters and territorial regulatory authorities by the Government of Russian Federation;
- financing of the expenditures of authorities regulating safety from the federal budget;
- availability of the open and transparent procedures for the elaboration of normative documents (requirements), licensing of any types of activities in the field of use of atomic energy, implementation of the State supervision over the safety by the use of atomic energy;
- availability of the system of enforcement of the organizations carrying out the activities of SNF and RW management and possibility to impose the administrative sanctions in the case of violation of the requirements of legislation and normative safety documents;
- use of the system of quality assurance according to the «Provision on the quality system of Federal environmental, industrial and nuclear supervision service in the field of State safety regulation by the use of atomic energy» (RD-03-29-2008) in its work.

Section F. Other General Safety Provisions

F.1. Responsibility of the License Holder (Article 21)

Article 21. Responsibility of the Licence Holder

21-1 Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.

21-2 If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.

The Federal Law «On the Use of Atomic Energy» (Article 34) stipulates that the operating organization, i.e. the license holder, is fully responsible for the safety of the nuclear facility, radiation source, storage facility as well as for the proper management of SNF, RW and other radioactive material.

The operating organization is an organization established in accordance with the legislation of the Russian Federation and acknowledged by a relevant body for control over the uses of atomic energy as capable of operating a nuclear facility, radiation source or storage facility and carrying out, on its own or with involvement of other organizations, siting, design, construction, operation and decommissioning of the nuclear facility, radiation source or storage facility as well as management of nuclear materials and radioactive substances.

The acknowledgement of the operating organization is effected by a relevant body for control over the uses of atomic energy, and the licensing is carried out by the state bodies regulating safety at the uses of atomic energy.

According to Article 34, the operating organization must have authorities, financial, material and other resources sufficient for carrying out designated functions.

According to Article 26, any activity in the field of the use of atomic energy that is subject to licensing by the state safety regulatory authorities is not allowed without a permit (license) for its conduct. The operating organization must have a license granted by the state safety regulatory authority with documented conditions which must be followed by the operating organization while operating in the field of the use of atomic energy.

According to Article 35, the operating organization should ensure:

- the use of the nuclear installation, radiation source and storage facility only for the purposes for which it is intended;
- the organization and coordination of development and implementation of quality assurance programs at all stages of development, operation and decommissioning of nuclear facilities, RS and SF;
- the development and implementation of measures to prevent accidents at nuclear facilities, RS and SF and mitigate their adverse consequences for nuclear facilities, RS and SF employees, population and environment;
- the security of rights of the nuclear facility employees for social and economic compensations;
- the accounting of individual exposure doses of the employees of nuclear facilities;
- the development and implementation, within its jurisdiction, of measures to protect the employees and public in the event of an accident at nuclear facilities, RS and SF;
- control and accounting of nuclear material and radioactive substances;

- physical protection of nuclear facilities, RS, SF, NM and radioactive substances;
- the development and implementation of fire safety measures;
- the radiation monitoring in the CA and surveillance zone;
- recruitment, training and maintaining competences of employees of nuclear facilities, RS and SF, and creation of necessary social and amenity conditions at work for them;
- public information on the radiation situation in the CA and surveillance zone;
- execution of other authorities as established by regulatory legal acts.

The license holder is made fully responsible for:

- the nuclear and radiation safety;
- the development and implementation of measures to improve safety at SNF and RW management;
- radiological protection of the personnel, public and environment;
- the financial coverage of civil liability for nuclear damage.

If the operating organization's permit (license) to operate the nuclear facility, radiation source or storage facility is cancelled, it continues being responsible for safety of the nuclear facility, radiation source or storage facility until the said objects have been transferred to another operating organization or a new permit (license) has been granted. If the operating organization fails to ensure safety of the said objects, the responsibility for safety and proper management rests with the relevant body for control over uses of atomic energy.

F.2. Human and Financial Resources (Article 22)

Article 22. Human and Financial Resources

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

- qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;*
- adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;*

F.2.1. Human Resources (Article 22 (i))

In accordance with the Federal Law «On the Use of Atomic Energy», the operating organization is to recruit, train and maintain competences of workers of the nuclear facility, radiation source, storage facility and is to create necessary social and amenity conditions at work.

In accordance with requirements established by the federal norms and rules in the field of the use of atomic energy (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-11), the operating organization which manages SNF and RW and other radioactive materials must provide for:

- before the commissioning of nuclear facilities, RS, or SF, an adequate number of employees of required competence who are permitted, in accordance with the established procedure, to work independently;
- recruitment, training and maintaining of the required competence of nuclear facilities, RS or SF employees;
- a system of recruitment and training of the employees, which is aimed at achieving, control and maintaining their competences as required for safe operation of nuclear facilities, RS, SF;

- a permit to work system to allow the employees of the required competence to perform permitted activities;
- regular emergency drills to master the employees' actions in case of operational events, including accidents, and accounting of lessons learned from previous accidents and errors;
- building the employees' safety culture.

According to conditions of licenses granted by Rostekhnadzor, the license holder undertakes a number of obligations, in particular:

- to ensure that the permitted activity is carried out only by employees having corresponding competence and work experience as well as relevant permits;
- to maintain the number and level of competence of the personnel responsible for safety ensurance;
- availability of plans (measures) to monitor any changes in the organizational structure or resources of the operating organizations which may affect safety of nuclear facilities, RS, SF or permitted activity;
- to arrange for training, examination, re-training and advanced training of the employees;
- to obtain permits from the Rostekhnadzor to perform works in accordance with the List of Positions of Nuclear Facility Personnel (the decree of the Government of the Russian Federation № 240 of 3.03.1997) (the qualification requirements for employees who are to be granted the said permits as per the list of positions are determined by the industry-wide qualification handbooks of positions of managers and specialists (employees) agreed upon with the Rostekhnadzor and Minzdravsotsrazvitiya of Russia);
- to obtain permits from the Rostekhnadzor to perform certain works in the field of the use of atomic energy by employees of radioactive waste storage facilities (specialized enterprises for RW management) and enterprises (institutions, organizations) which operate RS as per the List of Positions of Employees of RW Storage Facilities (Specialized Enterprises for RW Management) and Enterprises (Institutions, Organizations) which Operate RS.

In the Rostekhnadzor Headquarters and interregional offices the commissions have been established and operate, which review applications and grant permits to employees of the operating organizations to carry out works in the field of use of atomic energy.

Rostekhnadzor has developed guides on supervision over how the required level of competence is maintained of the employees who operate a nuclear facilities or SF (RD-04-28-97, RD-03-19-2007, RD-03-20-2007, RB-034-05 and other).

In the course of their inspections, Rostekhnadzor's inspectors who supervise over the permitted activities of operating organizations do regular reviews of issues related to the organization and implementation of training and permitting the employees to nuclear and radiation hazardous works, as well as they participate in the work of qualification commissions set up at enterprises.

In case the operating organization outsources other organizations to perform safety related works, it is made responsible for competence and experience of the outsourced employees.

Building the safety culture of the employees (personnel) should be a component of the content of training, permitting to work independently and maintaining of competence of the employees (personnel).

The safety culture requirements for employees of nuclear facilities, RS and SF are defined in the General Safety Provisions (NP-001-97, NP-16-05, NP-038-11, NP-033-01 and other).

Main measures to build the safety culture are:

- determining and publishing by the operating organization a safety policy adopted at facilities and organizations which execute works and (or) render services to the operating organization, which facilitates building a job climate and conditions appropriate for individuals to conduct safety related activities and which clearly defines goals of the organization and social commitment to the facility safety objectives;
- establishing clear boundaries between structural divisions accordingly to responsibilities and authorities as relates to the conduct of safety related activities at facilities and in organizations which execute works and (or) render services to the operating organization;
- determining of resources necessary for safety ensuring (financial, human, energy etc.);
- organizing regular checks and monitoring of the activity the facility safety depend on, learning from and introduction of experience in the facility safe operation.

Rosatom is the federal body for control over the uses of atomic energy in the Russian Federation in the designated area and is the most involved entity as regards the activity areas, functions and responsibilities thereof.

The maintaining of the existing multi-tier system of training, advanced training and qualification of the personnel in safety issues in nuclear power and industry is an important constituent of Rosatom's activities.

The federal plan of staff training and education for Rosatom's organizations for 1.01.2011 involved 53 federal-level educational institutions; the training and education were in 99 professions.

Managers and specialists were and are trained and educated at the industry-related advanced training institute, the Non-governmental Educational Institution of Supplemental Professional Education – Central Institute for Continuing Education and Training (CICE&T, Obninsk) and its branches (in Moscow and St. Petersburg).

Further enhancement of the nuclear industry staff training system is envisaged in the framework of the program for establishment and development of the National Research Nuclear University MEPhI (NRNU MEPhI). A specialist training structure at NRNU MEPhI includes pre-university vocational training, vocational secondary education, bachelor, master, post-graduate and doctoral candidacy, supplementary training, re-training and advanced training.

Conferences (including international), meetings, workshops and other events to discuss problem areas and exchange experience are among most effective methods for improving safety competencies of the personnel.

On the whole, the industry-wide system of the personnel training is capable of meeting the demand of enterprises and scientific institutions in accordance with the adopted «Strategy of Nuclear Power Development».

F.2.2. Financial Resources (Article 22 (ii))

Article 22. Human and Financial Resources

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

- ii) adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;*

According to Article 34 of the Federal Law «On the Use of Atomic Energy», the operating organization should have financial, material and other resources sufficient to support its functions.

Also, the law stipulates that, the operating organization jointly with the corresponding bodies for the control over the uses of atomic energy should raise a fund, within the limits provided by budgets of relevant tiers, to cover expenditures arising from decommissioning of the nuclear facility, radiation source or storage facility and to finance research and development to justify and improve safety of these facilities. The procedure, sources and use of this fund are established by Decree of the Government of the Russian Federation № 367 of 02.04.1997.

Target cash amounts written in cost of services of the operating organization are the source of financing the costs to ensure nuclear and radiation safety of such facilities. According to the Rules of Payment, the organizations which operate nuclear and radiation hazardous productions and facilities allocate cash to generate resources required to ensure safety of the said productions and facilities at their all life and development stages, including decommissioning (the decree of the Government of the Russian Federation № 576 of 21.09.05).

According to the «Provisions for Licensing of Activities in the Field of Use of Atomic Energy» (the Government of the Russian Federation Decree № 865 of 14.07.1997), to get a Rostekhnadzor's license, the applicant must provide documents which confirm that the funding sources for decommissioning of nuclear facilities, RS or SF, including a special fund to finance costs related to decommissioning these facilities, and to finance research and development to improve safety of these facilities, are available to the applicant.

Besides, the documentary package for getting a Rostekhnadzor's license by the applicant must include documents which confirm that the applicant has a financial coverage of the civil liability for damages and harm caused by radiation impact, as stipulated in the legislation of the Russian Federation.

On the 13-th of August 2005 the Vienna Convention on the Civil Liability for Nuclear Damage (the Vienna Convention) of 1963 came into force, which provisions stipulate that:

- in case of a radiation accident (nuclear incident) at nuclear installation the operator of this nuclear installation is fully (absolutely and exclusively) responsible for possible nuclear damage to third parties;
- the operator's nuclear damage liability cannot be less than US \$ 5m as per gold parity as of April 29, 1963;
- when obtaining a nuclear installation operating license the operator should provide a documented financial security of its liability (a financial guarantee of the capability to reimburse the nuclear damage). The financial security of liability can be provided in the form of civil liability insurance.

The Government of the Russian Federation is involved in the process of loss or damage indemnification through provision of compensation payments for the loss or damage caused by radiation. The operator is liable for that loss or damage which exceeds the liability limit established for this operator.

The Federal Law of the Russian Federation «On the State Atomic Energy Corporation «Rosatom»» establishes the procedure for raising funds to maintain safety of SNF and RW management facilities.

Rosatom can create special reserve funds to maintain safety of SNF and RW management facilities to last through their service lives and those for their decommissioning; these funds are to include:

- a fund to finance costs of nuclear, radiation, industrial and fire safety insurance; keeping and equipping emergency rescue teams and paying for their works (services) to prevent and eliminate consequences of emergencies;
- a fund to finance costs of physical protection, control and accounting of nuclear material, radioactive substances and RW;
- a fund to finance costs related to decommissioning of nuclear facilities, RS or SF; SNF management; research and development to justify and improve safety of these facilities;
- a fund to finance cost of upgrading of organizations within the nuclear power and industry complex of the Russian Federation; development of nuclear science and technology; design and survey and implementation of other investment projects;
- a fund for financing expenses incurred by RW disposal.

Rosatom's special reserve funds will be raised through payments by enterprises and organizations which operate especially radiation and nuclear hazardous productions and facilities.

The FTP «Nuclear and Radiation Safety» provides for a massive financing of measures to ensure nuclear and radiation safety at SNF and RW management. Some of measures envisaged by this program are given in section B.

F.3. Quality Assurance (Article 23)

Article 23. Quality Assurance

Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.

According to Article 35 of Federal Law «On the Use of Atomic Energy», the operating organization is responsible for organizing and coordinating the drafting and implementation of quality assurance programs at all stages of development, operation and decommissioning of a nuclear facilities, RS and SF. Therefore, when managing SNF and RW, the operating organizations and those that perform the activities and provide the services must assure their quality at all stages of development, operation and decommissioning of the facility through proper implementation of the quality assurance programs.

Requirements for the composition and content of the quality assurance program are determined in a number of federal norms and rules and regulations by Rostekhnadzor (NP-041-02, NP-011-99, RB-003-98) developed on the basis of the Federal Law «On the Use of Atomic Energy» with consideration of recommendations of the IAEA and provisions of the international ISO 9000 series standards.

According to these documents, the objective of a quality assurance program, which is implemented by the operating organization and organizations that carry out works and render services to the operating organization, is the regulation of quality assurance activities aimed at meeting main safety principles and criteria for nuclear facilities, RS and SF.

The regulations define that the quality assurance policy should prioritize nuclear and radiation safety; set main quality assurance targets; define tasks to be solved to achieve a quality assurance target and way of solving thereof; define responsibilities as regards quality assurance of the top management of the organization which is the author of the quality assurance program (programs).

The operating organization implements quality assurance activities and organizes drafting of the quality assurance program (programs), as well as controls over the quality assurance activities of organizations that carry out works and render services to the operating organization. Organizations that carry out works and render services to the operating organization develop local quality assurance programs with account taken of requirements of the operating organization. The operating organization plans the quality assurance activities and controls implementation of quality assurance programs.

Availability of a quality assurance program and its implementation plan are the compulsory requirements for obtaining licenses granted by Rostekhnadzor and complying with license conditions. Rostekhnadzor reviews quality assurance issues in the course of inspections at enterprises and organizations which carry out activities in the field of the use of atomic energy.

Russia's nuclear industry pays much attention to implementation and certification of management systems for conformance to requirements of international standards of ISO 9000, ISO 14000 series. For example, as of 01.01.2011, large companies such as Rosenergoatom Concern OJSC and JSC TVEL certified to ISO 9001 the following enterprises:

- Smolensk, Rostov and Balakovo NPP;
- JSC NCCP, JSC MSZ, JSC CMP, JSC MCMP, JSC SCC, JSC UECC, JSC AECC, JSC PA ECP, JSC KMP, JSC Uralpribor.

Environmental management systems as per standard GOST R ISO 14000-2007 are implemented at the following enterprises:

- Rosenergoatom Headquarters, Balakovo, Rostov, Smolensk, Kola, Leningrad, Kursk, Novovoronezh, Kalinin, Beloyarsk, and Bilibino NPPs;
- JSC NCCP, JSC CMP, JSC MSZ, JSC MCMP, JSC PA ECP, JSC UECC, JSC SCC, JSC AECC, JSC KMP.

In 2008 Rosatom approved the «Basics of the Environmental Policy» (Environmental Policy). In the framework of implementation of the Environmental Policy in 2009 sixty five enterprises of Rosatom adopted internal environmental policies where the enterprises undertook to solve specific environmental problems aiming at reducing impacts on the environment and continuous improvement of the environmental management system; they also published environmental safety reports.

F.4. Operational Radiation Protection (Article 24)

Article 24. Operational Radiation Protection

24-1 Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility:

- i) the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;*
- ii) no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection; and*
- iii) measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.*

24-2 Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:

- i) to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and*
- ii) so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.*

24-3 Uncontrolled and Unplanned Releases

Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented to control the release and mitigate its effects.

In the Russian Federation, radiation protection of the personnel of nuclear facilities, RS and SF and the public is regulated by the following main federal laws and regulatory legal acts as follows:

- Federal Law «On the Use of Atomic Energy»;
- Federal Law «On the Radiation Safety of the Population»;
- Federal Law «On the Environmental Protection»;
- Radiation Safety Standards (NRB-99/2009);
- Basic Sanitary Rules of Radiation Safety (OSPORB-99/2010);
- General Safety Provisions of nuclear facilities, RS and SF (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-058-04, NP-038-02).

These documents reflect internationally acknowledged principles of radiation safety and are consistent with recommendations of the International Commission for Radiation Protection (ICRP) and **the IAEA Safety Standards Series. Fundamental safety principles (2007) (previous IAEA document No 110 «Safety of Nuclear Installations»), No 115 «Basic Safety Standards», etc.**

The Federal Law «On the Use of Atomic Energy» stipulates that a CA and surveillance zone are to be established for the purposes of population protection near the site of a nuclear facilities, RS or SF. In addition, the operating organization should ensure:

- for nuclear facility workers and population, safe handling of nuclear material and radioactive substances and their storage;
- accounting of individual exposure doses of nuclear facility workers;
- radiation monitoring in the CA and surveillance zone;
- public information on the radiation situation in the CA and surveillance zone.

The Federal Law «On the Radiation Safety of the Population» stipulates three basic principles of radiation safety and their implementation mechanism:

- dose limitation principle, i.e. permissible limits of dose burdens to the population and personnel should not be exceeded;
- justification principle, i.e. no use of ionizing radiation sources should be authorized unless the practice produces sufficient benefit to man and society to offset the radiation harm that it might cause in addition to the natural radiation exposure;
- optimization principle, i.e. while using any ionizing radiation source to keep the individual exposure doses and the number of exposed individuals as low as reasonably achievable, economic and social factors taken into account.

The law establishes the following basic hygienic guidelines (permissible dose limits) of exposure to ionizing radiation sources (including SNF and RW management) in the Russian Federation:

- for the public – an average annual effective dose is equal 0.001 Sv or effective dose over the life period (70 years) is equal to 0.07 Sv; it is permissible at certain years to have higher values of the effective dose, provided the average annual effective dose calculated over five sequential years will not exceed 0.001 Sv;
- for the personnel – an average annual effective dose is equal to 0.02 Sv or an effective dose over the labor period (50 years) is equal to 1 Sv; the exposure to an annual effective dose up to 0.05 Sv is permissible, provided the average annual effective dose calculated over five sequential years will not exceed 0.02 Sv.

Reference levels of monitored parameters (dose size, dose rate, radioactive contamination, permissible releases and discharges) are established for the purposes of operational radiation protection to avoid exceedence of permissible dose limits, to keep up to the achieved level of radiation safety, to further reduce exposure of the personnel and population and radioactive contamination of the environment.

The personnel exposure to dose limits in excess of established values in the course of an accident elimination or prevention can be permitted only if it is necessary to rescue humans and (or) prevent their exposure. The operating organization administration should inform workers involved in such operation on a possible risk of exposure in excess of established dose limits and get their consent for such involvement, as well as it should get a relevant permit from FMBA of Russia or its regional offices.

Federal norms and rules (NRB-99/2009, OSPORB-99/2010, SPORO-2002, NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-11) stipulate that the administration of nuclear facilities, RS and SF should ensure accounting of exposure doses of the personnel and outsourced employees, as well as should develop and implement measures to reduce the personnel exposure to a reasonably achievable level.

In an organization, the availability of an operating radiation and health physics monitoring system is a binding condition for executing SNF and RW management activities. Radiation monitoring is carried out by enterprises and organizations (in-process monitoring) and by supervisory and bodies of sanitary & epidemiological oversight of Russia (state-level monitoring).

At the SNF and RW management, the in-process monitoring is carried out in respect of all main radiation factors which determine exposure levels of the personnel and population. In each organization a radiation monitoring system should include a specific list of controls, types of radiation-measurement and dose-measurement instrumentation, measurement points and frequency of monitoring, and is subject to coordination with FMBA of Russia.

Internal irradiation is monitored by internal radiation monitoring laboratories which are within the FMBA of Russia's hygiene and epidemiology centers. The personnel effective doses and, as necessary, equivalent exposure doses to individual organs, are calculated basing on results of the in-process monitoring with the account taken of the radiation monitoring data obtained by regional offices of FMBA of Russia.

For individual monitoring it is necessary to account the annual effective and equivalent doses, effective dose for 5 sequential years as well as a total dose accumulated over the entire period of the work in a profession. Results of the individual monitoring of the personnel exposure doses should be kept for 50 years. FMBA of Russia has set up and is maintaining a cumulative databank of individual health physics monitoring of Rosatom's employees and special medical and exposure registers.

In Russia, a reduction of exposure of the personnel at nuclear facilities, RS and SF is achieved through implementation of a set of technical and administrative measures aimed at improving radiation protection, safety culture and organization of labor.

An annual average exposure dose to the personnel of Rosatom's enterprises was: in 2008 — 2.01 mSv, in 2009 — 1.74 mSv, and in 2010 — 1.72 mSv.

Regulations establish requirements that a design of nuclear facilities or RS or SF includes a set of engineered features and administrative measures to limit radionuclide releases to the environment during normal operation, design basis accidents and elimination of consequences of these accidents.

The OSPORB-99 establishes that the permissible releases and discharges from radiation facilities are calculated proceeding from the requirement that the effective dose to the population over 70 years of life due to annual releases and discharges does not exceed the established dose limit quota.

At large nuclear facilities, RS and SF, conditions of radiation protection of the personnel and releases of RS into the environment are continuously monitored by radiation safety units. Monitoring results are submitted to regulatory authorities as monthly, quarterly and annual reports.

In the event of an unanticipated or uncontrolled release of radioactive substances into the environment in excess of the established limits the operating organization must undertake measures to identify the cause of release and bring the facility back to normal operation. Operational events at nuclear facilities, RS and SF, including accidents, are subject to investigation with the results submitted to the regulatory body for review.

The following arrangements have been made functional in Russia: the Unified State System for Monitoring and Accounting for Exposure Doses to the Population of the Russian Federation (ESKID), the Unifies State Automated Radiation Monitoring System in the Russian Federation (EGASKRO), the Radiation and Hygienic Certification System for facilities that use ionizing radiation sources and for territories if the Russian Federal Subjects.

In 2008-2010, gaseous and aerosol releases and water discharges of radionuclides from nuclear enterprises were within the established limits. No accidents which consequences could adversely affect the environment were reported. A further reduction of the man-induced impact to the environment (within the established guidelines) took place.

A total activity of radionuclides released to the environment by nuclear power and industry enterprises in 2010 reduced by 15% as compared to 2009. Releases of key dose-contributing

radionuclides – strontium-90, iodine-131, cesium-137 – did not exceed 6% of the established guidelines.

Radionuclide releases with discharge water to the drainage network, on the whole for the nuclear industry, was about 50% for alpha-emitting nuclides and less than 2% for beta-emitting nuclides of the established guidelines.

A categorization of potential radiation hazardous facilities is given in Appendix F of this Report.

F.5. Emergency Preparedness (Article 25)

Article 25. Emergency Preparedness

25-1 Each Contracting Party shall ensure that before and during operation of a spent fuel or radioactive waste management facility there are appropriate on-site and, if necessary, off-site emergency plans. Such emergency plans should be tested at an appropriate frequency.

25-2 Each Contracting Party shall take the appropriate steps for the preparation and testing of emergency plans for its territory insofar as it is likely to be affected in the event of a radiological emergency at a spent fuel or radioactive waste management facility in the vicinity of its territory.

In Russia, protection of the personnel and population in case of accidents at nuclear facilities, RS and SF is subject to a set of federal laws and regulatory legal acts, specifically:

- Federal Law «On the Use of Atomic Energy»;
- Federal Law № 68-FL of 11.11.1994 «On the Protection of the Population and Territories against Emergencies of Natural and Man-caused Origin»;
- Federal Law «On the Radiation Safety of the Population»;
- «Provisions for the Unified State System for Prevention and Elimination of Emergencies» (approved by Decree of the Government of the Russian Federation № 794 of 30.12.2003, as amended);
- General Safety Provisions (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-11);
- Requirements to Content of a Personnel Protection Plan in the Event of an Accident and to Emergency Preparedness (NP-075-06, NP-015-2000, NP-077-06, NP-078-06);
- Requirements for Planning and Preparedness for Elimination of Consequences of an Accident at Transportation of Nuclear Material and Radioactive Substances (NP-074-06).

These documents have been developed taking account of the Russian and international experience and recommendations of the IAEA safety guides:

- ***GS-R-2. Preparedness and response for a Nuclear or Radiological Emergencies (2002);***
- ***GS-G-2.1. Arrangements for Preparedness for a Nuclear and Radiological Emergencies (2007).***

The said regulations are to prevent initiation and development of emergencies and to reduce damage thereof. They set guidelines for protection of the Russian Federation citizens and foreign nationals, as well as the environment, against natural and man-induced emergencies; and determine principles of organization, force and capabilities, and interaction of emergency responders.

The Russian Federation is a party to international agreements dealing with emergency preparedness issues, including accidents involving transboundary consequences:

- The Convention on Environmental Impact Assessment in a Transboundary Context, 1991;

- Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency, 1987;
- Convention on Early Notification of a Nuclear Accident, 1986.

The Federal Law «On the Use of Atomic Energy» (Article 36) defines responsibilities of the operating organization as regards protection of the nuclear facility workers, population and environment in the event of an accident at a nuclear facilities, RS or SF.

The operating organization's actions and interaction with different bodies as regards implementation of measures to protect nuclear facility workers and population in the event of an accident should be provided by action plans.

The operating organization should develop and implement measures to prevent accidents at a nuclear facility, radiation source and storage facility and to reduce their adverse consequences; it should develop and implement a plan of measures to protect workers (personnel) in the event of an accident at nuclear facilities, RS and SF which should be available before commissioning of operation of a nuclear facilities, RS and SF.

The Law (Article 36) also stipulates that in the event of an accident that led to a release of radioactive substances in excess of the established limits to the environment, the operation organization should be fast in reporting on the radiation situation to relevant federal authorities, local authorities and population of the most threatened territories, state bodies for control over uses of atomic energy, state safety regulatory bodies, units of the system for the state monitoring over radiation situation in the Russian Federation and Russian system for emergency prevention and response.

Plans for protection of the personnel and population in the event of accidents and for elimination of their consequences are developed with the account taken of the facility category as regards its potential radiation hazard and contain decision-making criteria for protection actions. Emergency procedures for the personnel should be developed for all facilities of potential radiation hazard.

The operating organization develops emergency training and exercise methodologies and (or) programs to master personnel actions in the event of accidents and arranges for periodic exercises in this regard.

In the course of licensing, the regulatory body assesses a degree of justification and sufficiency of engineering and administrative solutions which ensure preparedness of the operating organization for elimination of accidents and their consequences.

A review statement may include proposals related to the license conditions as regards improvement of emergency preparedness of the operating organization, which eventually are considered by Rostekhnadzor in formulating license conditions.

Preparedness of the operating organization for elimination of accidents and their consequences is checked by both Rostekhnadzor's inspections during the entire life of nuclear facilities, RS and SF and during checks conducted by Rosatom (departmental oversight at Rosatom's enterprises).

The Unified State System for Emergency Prevention and Elimination (RSChS) has been created and operated in the Russian Federation. The system covers all territory of Russia and is operated by the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Natural Disaster Consequences (EMERCOM of Russia).

The system includes the functional subsystem of Rosatom which is an industry-wide emergency prevention and elimination system (OSChS) for the nuclear industry enterprises. The system has been set up to organize and operate in the area of protection of the personnel and plots of enterprises against emergencies and to ensure preparedness and response to potential nuclear or radiation accidents in organizations which operate specially nuclear and radiation hazardous productions and facilities.

The OSChS of Rosatom incorporates controlling bodies, force and capabilities of Rosatom's emergency rescue units and operates at federal and facility levels. Control system, force, capabilities and preparedness of OSChS for emergency response and elimination were described in the First National Report.

Development and advancement of the federal systems for ensuring and monitoring nuclear and radiation safety in normal operation and accidents is one of activity areas under the FTP «Nuclear and Radiation Safety» which funding amounts to about RUR20bn.

In 2008-2010 territorial emergency response systems and automatic radiation monitoring systems were established in Murmansk and Tver Regions. The works are underway to develop territorial radiation monitoring systems and emergency response systems in Arkhangelsk and Kursk Regions (completion in 2011), Kaluga Region, Moscow; similar works are planned to execute in Volgograd, Voronezh, and Nizhniy Novgorod Regions.

A hygienic support of tactical medical aid during radiation accident is rendered by FMBA. An exhaustive database on emergency support during radiation accident has been generated.

Practical experience in medical aid during radiation accidents has resulted in setting up emergency teams to render the said assistance and to minimize radiation accident consequences.

In 2010, basing on the existing radiation hygiene entities three regional health physics centers of FMBA of Russia were established. Their activities are aimed at development and improvement of methods for assessment of radiation accident consequences and planning of medical and hygienic measures during elimination of their consequences.

F.6. Decommissioning (Article 26)

Article 26. Decommissioning

Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that:

- i) qualified staff and adequate financial resources are available;*
- ii) the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;*
- iii) the provisions of Article 25 with respect to emergency preparedness are applied; and*
- iv) records of information important to decommissioning are kept.*

In Russia decommissioning of nuclear facilities, RS and SF is regulated by a set of federal laws and regulatory legal acts:

- Federal Law «On the Use of Atomic Energy»;
- «Provisions for the Procedure, Sources of Funding and Rules of the Use of the Special Fund to Cover Expenses Incurred by Decommissioning of Nuclear Installations, Radiation Sources, Storage Facilities for Nuclear Materials, Radioactive Substances and RW, and to

Cover Expenses Incurred by Research and Development to Justify and Improve Safety of these Facilities», as approved by Decree of the Government of the Russian Federation № 367 of 02.04.1997;

- Rules of safety insurance at decommissioning of nuclear facilities, RS and SF (NP-057-04, NP-012-99, NP-028-01 etc.).

The Federal Law «On the Use of Atomic Energy» Article 33 stipulates that the procedure and measures to ensure decommissioning of nuclear facilities, radiation sources and storage facilities should be foreseen in the nuclear facility design as per norms and rules in the field of the use of atomic energy.

The procedure for creating funding sources for the decommissioning of nuclear facilities, radiation sources and storage facilities is established by the Government of the Russian Federation and should be determined before commissioning of the said facilities.

The operating organization jointly with relevant bodies for control over the uses of atomic energy establishes, with cash amounts provided out of budgets of relevant levels, a special fund to cover expenses associated with decommissioning of a nuclear facilities, RS or SF. The fund operating procedure and sources of funding are defined by the Government of the Russian Federation (Decree of the Government of the Russian Federation № 367 of 02 April 1997). The Federal Law «On the State Atomic Energy Corporation «Rosatom»» changed the procedure for raising financial resources for maintaining safety of SNF and RW management facilities, i.e. special reserve funds are raised and managed by Rosatom (see section F.2.2).

Federal norms and rules in the field of use of atomic energy (NP-057-04, NP-012-99, NP-028-01 etc.) establish that organizational and technical measures related to design, construction and operation of nuclear facilities, RS and SF should be carried out considering their future decommissioning (closure).

Decommissioning (closure) of nuclear facilities, RS and SF should be carried out in accordance with nuclear facilities, RS and SF decommissioning program (closure program) and decommissioning (closure) project.

The nuclear facilities or SF decommissioning project must be developed in advance, i.e. before the end of their service:

- for facilities pertaining to category 1 of the radiation hazard (Annex F2) – not less than 5 years prior;
- for facilities pertaining to category 2 of the radiation hazard – not less than 3 years prior;
- for facilities pertaining to category 3 of the radiation hazard – not less than 1 year prior.

The decommissioning (closure) of nuclear facilities, RS and SF should be preceded by an integrated engineering and radiation survey of nuclear facilities, RS and SF. Basing on the survey outcomes, the operating organization develops the decommissioning (closure) project and drafts a safety analysis report for the decommissioning (closure).

The operating organization should ensure safety at decommissioning (closure) of nuclear facilities, RS and SF, including the development and implementation of administrative and technical measures to prevent accidents and mitigate their consequences, safe management of radioactive substances and radioactive waste, its control and accounting, physical protection of nuclear facilities, RS and SF, RW and SNF, environmental monitoring on nuclear facility site, in CA and surveillance zone.

The administrative and technical measures being implemented in the course of preparation for decommissioning of nuclear facilities, RS and SF should be aimed at reducing radiation

impact to workers (personnel), population and environment down to as low as reasonably achievable, economic and social factors taken into account.

A nuclear facilities, RS and SF being decommissioned should be staffed with workers (personnel) of necessary competence and permits to work independently issued in accordance with the established procedure. The operating organization is responsible for recruitment, training, issue of permits for independent work and maintaining of the workers' (employees') qualifications. The system of recruitment and training of nuclear facilities, RS and SF workers (personnel) should be aimed at maintaining the level of their skills required for safe decommissioning of nuclear facilities, RS and SF.

During decommissioning of a nuclear facilities and storage facility the operating organization should keep records and information necessary for decommissioning, including design and operating documentation.

Rosatom has adopted the «Concept of Decommissioning of Nuclear Installations, Radioactive Sources and Storage Facilities» which aims at generating basic provisions as to create a system for decommissioning of nuclear and radiation hazardous facilities in jurisdiction of Rosatom.

This goal is achieved through:

- improvement and development of the legal regulatory basis that regulates safe decommissioning process through to exemption of the facility from regulatory control by the state nuclear and radiation safety regulatory bodies;
- development of economic mechanisms to support decommissioning activities, social and human resources factors taken into account (creation of conditions);
- scientific, technical and technological support of decommissioning activities (creation of a possibility).

By present the Russian Federation has shut down but has not decommissioned over 120 nuclear and radiation hazardous facilities, including:

- 4 nuclear power units;
- 13 production uranium-graphite reactors;
- 11 research reactors.

Urgent solutions are needed for 20 open-air storage reservoirs for RW, including decommissioning (care and maintenance) of the most contaminated industrial reservoirs at PA Mayak: V-9 (Lake Karachai), V-17 (Lake Staroye Boloto).

In 2008-2010, under the FTP «Nuclear and Radiation Safety» the following key decommissioning efforts on nuclear and radiation hazardous facilities were carried out:

- open-air storage reservoir № 354 at MCC was put under care and maintenance;
- diffusion equipment of Building 8 and Site 115a at SCC was disposed of;
- VVRL-02,03 reactor installations at FSUE NIIP were decommissioned;
- Installation for reprocessing of uranium metal at ChMP was decommissioned.

Section G. Safety of Spent Fuel Management

G.1. General Safety Requirements (Article 4)

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- i) ensure that criticality and removal of residual heat generated during spent fuel management are adequately addressed;*
- ii) ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;*
- iii) take into account interdependencies among the different steps in spent fuel management;*
- iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;*
- v) take into account the biological, chemical and other hazards that may be associated with spent fuel management;*
- vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;*
- vii) aim to avoid imposing undue burdens on future generations.*

The legal framework of the Russian Federation provides for the measures to be taken at all stages of spent nuclear fuel management in order to ensure a proper protection of the personnel, population and environment against the radiation impact associated with the above management.

Main requirements for the safe management of SNF and safety ensuring of installations for SNF management are set forth by the following federal laws and federal standards and rules:

- Federal Law № 170-FL «On the Use of Atomic Energy»;
- Federal Law «On the Radiation Safety of Population»;
- Federal Law «On the Environmental Protection»;
- Radiation Safety Standards (NRB-99/2009);
- Basic Sanitary Rules of Radiation Safety (OSPORB-99/2010);
- General Safety Provisions of nuclear facilities, RS and SF (NP-001-97, NP-033-01, NP-022-2000, NP-016-05,);
- Accounting of External Natural and Man-Induced Events to Nuclear Facilities (NP-064-05);
- Facilities for Reprocessing of Spent Nuclear Fuel. Safety Requirements. (NP-013-99);
- Dry Storage Facilities for Spent Nuclear Fuel. Safety Requirements. (NP-035-02);
- Rules of Safety at Storage and Transportation of Nuclear Fuel on Sites of Nuclear Facilities (NP-061-05).

A complete list of regulatory documents is given in Annex E of this Report.

G.1.1. Criticality and Removal of Residual Heat (Article 4 (i))

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- i) ensure that criticality and removal of residual heat generated during spent fuel management are adequately addressed.*

The federal norms and rules in the field of the use of atomic energy envisage a comprehensive set of measures developed in order to ensure nuclear safety during the SNF management and removal of residual heat resulting from the SNF management, including stages of: on-site storage, transportation, storage and reprocessing at the SNF reprocessing plants.

Nuclear safety at SNF management is regulated by NP-063-05, NP-013-99, NP-035-02 and Safety Rules of Storage and Transportation of Nuclear Fuel at Nuclear Facilities (NP-061-05), which cover NPPs, including separate storage facilities on the plant sites, SNF storage facilities outside nuclear facilities and SF plots, research nuclear facilities, coastal and floating SNF storages of ships and other waterborne vehicles.

According to the Russian legal framework, during the management of spent nuclear fuel the effective neutron multiplication factor (Keff) must be maintained as low as practicably acceptable and should not exceed 0.95 during normal operation. In case of any single failure Keff should not exceed 0.98 (NP-063-05).

Development of technologies, design of equipment, engineering, construction, operation and decommissioning of SNF management facilities should ensure:

- that a self-sustained chain fission reaction (SCR) is avoided both under normal conditions and any initiating event considering in the safety case;
- prevention of uncontrolled and unauthorized reprocessing, accumulation, movement, transfer and transportation of nuclear fissile material (substances) (NFM(S));
- prevention of violation of conditions and requirements of nuclear safety as established in design, engineering and technology documents, nuclear safety regulations both for normal operation and initiating events of accidents;
- preferable use of safe equipment, process media and automation;
- nuclear safety parameters are controlled in combination with interlocks;
- a conservative approach is used for safety case.

Design solutions should be selected with the preferable use of equipment which design and geometry features exclude a possibility of SCR.

Nuclear safety of SNF storage is ensured through, including:

- limitations on placement of SNF in shrouds, racks, stacks, transportation packages (TUK);
- limitations on a number of fuel rods and assemblies in shrouds, racks, drums with SNF and TUKs;
- limitations on a number of packages, shrouds in a group and packages in a stack;
- limitations on placement of shroud groups, stacks, racks, SNF drums, on-site TUKs;
- the use of neutron absorbers;
- control over positions of fuel rods and assemblies, heterogeneous absorbers, packages, shrouds, racks, stacks;

- control over presence, condition and composition of the cooling media and occurrence of moderator in SNF dry storage facilities;
- observance of process parameters of the SNF storage and transportation system.

Nuclear safety of an SNF reprocessing facility is achieved through:

- limitations on geometry and size of equipment;
- limitations on mass of nuclear hazardous fissile nuclides, substance, material, their isotopics and concentration;
- limitations on concentration of nuclear hazardous fissile nuclides;
- the use of neutron absorbers;
- limitations on isotopics of nuclear hazardous fissile material;
- limitations on mass fraction of neutron moderators in the nuclear hazardous fissile material;
- limitations imposed on reflectors and placement of equipment;
- a combination of above methods and limitations.

Measures for residual heat removal (passive and active systems) are compulsory to implement at all stages of the spent nuclear fuel management so that normal operation limits be observed, while preference is given to the passive systems.

A design of the SNF storage and transportation system should include measures or devices which exclude a possibility of an increase in fuel cladding temperature during storage and transportation in excess of values established for normal operation of the storage and transportation system and operational events, including design basis accidents.

SNF spent fuel pools should be fitted with systems for heat removal from the cooling media which are necessary for safety ensurance.

A heat removal system should be designed so that temperature of the cooling media in spent fuel pools does not exceed design limits during normal operation and operational events, including design basis accidents.

In case of dry storage of SNF, the design should identify a cooling method (forced circulation and (or) natural convection) that excludes a possibility of an increase of fuel cladding temperature in excess of values established by design for normal operation and operational events, including design basis accidents.

At the stages of design, construction and operation of installations and devices used in the SNF management lists of initiating events of design basis accidents and a list of beyond design basis accidents should be developed to include initiating events, development paths and consequences.

It is mandatory to include in the list the accidents associated with SCR and disruption of residual heat removal.

G.1.2. Minimization of Generation of Radioactive Waste (Article 4 (ii))

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- ii) ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;*

Federal norms and rules (NP-058-04 etc.) stipulate that in the course of design and operation of nuclear facilities, RS and SF conditions (engineering solutions and administrative measures) should be provided where generation of radioactive waste is kept to the minimum practicable quantity.

According to the General Safety Provisions (NP-016-05, NP-058-04 etc.), the operating organization should ensure safe management of RW, including:

- timely RW reprocessing and conditioning;
- prevention of unplanned RW accumulation;
- limitation of RW generation to the minimum practicable;
- establishing norms for generation of liquid and solid RW and periodic revision thereof, good practices of RW management taken into account;
- avoidance of storage of unconditioned RW which is not foreseen in the design and operating documentation;
- avoidance of releases (discharges) of radionuclides into the environment in excess of limiting permissible levels.

According to the Rostekhnadzor's guiding documents (for example, RD-05-15-02), a plan of reduction of releases and discharges should be included in the licensing package by the operating organization when applying for a license.

The FTP «Nuclear and Radiation Safety» plans for a set of measures to reduce quantities of RW accumulated during the past activities, which provide for timely reprocessing of RW being generated. This information is given in section B of this Report.

G.1.3. Interdependence among the Different Steps in Spent Fuel Management (Article 4 (iii))

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- iii) take into account interdependencies among the different steps in spent fuel management;*

The system of regulation of the design, construction, operation, maintenance and repair, inspection and testing of SNF facilities, as well as accounting and review of their operational events, existing in Russia, allows for continuous ensuring safety of management of SNF at all stages.

The task of development of an up-to-date system for the safe management of SNF is defined in the Federal Law «On the State Atomic Energy Corporation «Rosatom»», FTP «Development of Nuclear Power Industrial Complex» and FTP «Nuclear and Radiation Safety» as a top priority. Having in mind a realistic projection of SNF generation and accumulation in on-site storage facilities, the nuclear industry of the Russian Federation has started developing centralized storage facilities for SNF and reprocessing facilities.

The FTP «Nuclear and Radiation Safety» foresees a federal budget financing of development of SNF management infrastructure.

New SNF reprocessing technologies are being developed, which can substantially reduce a quantity of waste. At MCC it is planned to set up a Pilot demonstration center (PDC) for SNF reprocessing using innovative technologies with a capacity of up to 100 tons per year at MCC. It is also planned to substantially reduce RW generation during SNF reprocessing. At the PDC it is planned to experimentally verify and test several SNF reprocessing technologies.

In 2010 the state regulatory authorities granted a positive review statement to the PDC project, a «cold» bench was developed and equipment tests started. It is planned that by 2015 the PDC will be commissioned.

Results of pilot commercial operation of the PDC will be used as a basis for choosing of technological and engineering solutions for development of a large-scale plant for SNF reprocessing, RT-2, which is planned to commission by 2025–2030.

G.1.4. Protection of Individuals, Society and Environment (Article 4 (iv))

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;*

Radiation safety regulation and existing regulatory requirements for protection of the personnel, population and environment, assessment of radiation impact to the nuclear facilities, RS and SF personnel, procedure for radiation monitoring of the personnel exposure and contamination of the environment due to releases and discharges resulted from SNF management, as well as the state supervision over the radiation protection of the personnel, population and environment are described in detail in section F.4 (Article 24).

The issue of whether the impact to the environment is permissible is solved in the course of the state environmental review and decision-making on granting permits (licenses) to carry out a certain activity.

When applying for a license for siting, construction, operation and decommissioning of a SNF management facility, a licensee should submit, within a document package, a SAR which should contain, among other, an assessment of radioactive releases and discharges, projected radiological impact on the public and environment, and a justification that engineering features and administrative measures for ensuring safety of the personnel, public and environment are adequate.

Permissible levels of releases/discharges are calculated and approved for each nuclear facility in accordance with methodologies and approved by Rostekhnadzor and coordinated with FMBA of Russia. Their observance guarantee that the public exposure dose limit of 1 mSv per year from all radiation sources via all possible irradiation paths is not exceeded.

The regulatory bodies review the submitted safety analysis of the facility and make a decision on whether to grant a license or not. If necessary, the regulatory body may grant a license which will restrain the SNF facility operations by certain special conditions.

Compliance with requirements of the legal regulatory framework developed in the Russian Federation ensures fulfillment of the population and environment safety requirements; with that, it is assumed that the environmental monitoring standards required to ensure the radiation protection of humans at the state-of-the-art level guarantee that biota is also protected.

During operation of a SNF management facility the operating organization carries out a monitoring to ensure that releases and discharges of radioactive substances into the environment and content of radionuclides in the natural environment objects are within the established limits. Local or federal competent authorities also implement an independent monitoring program.

On-line information on the radiation situation in regions where enterprises of the Russian Federation are located as supplied by the automated radiation monitoring system can be obtained in the Internet at <http://www.russianatom.ru>

The Russian Federation undertakes rehabilitation of territories affected by radiation contamination, including that under the federal target programs and other projects and programs aimed at radiation safety ensuring in a contaminated region.

The radioecological monitoring being carried out during SNF transportation and storage is an important constituent of the environmental safety. Monitoring results are presented in annual reports. In 2010, a content of airborne radionuclides at industrial sites of enterprises handling SNF, within CA boundaries and nearby settlements was substantially lower than the permissible levels set forth by NRB-99/2010.

As to the projects of importation of SFAs for storage and reprocessing in the Russian Federation, the unified project implementation procedure provides for implementation of special environmental programs (SEP) at the expense of the project funds.

The unified projects of RR SFA importation include a number of SEP as follows:

1. «Reduction of Radiation Risks in the PA Mayak Region: development of transportation capabilities to ensure radiation safety of operations to eliminate industrial reservoir V-9»;
2. «Improvement of Radiation Monitoring in the PA Mayak Region: development of dosimetry, radiometry, spectrometry monitoring systems and computer-based and methodological means of data analysis and processing»;
3. «Rehabilitation Measures at Radiation-contaminated Sections of the River Techa Floodlands within Muslyumovo Railway Station Boundaries»;
4. «Rehabilitation of Radiation-contaminated Sections of PA Mayak Territory»;
5. «Rehabilitation of Muslyumovo Village territory and, partially, Muslyumovo Railway Station where inhabitants are resettled in accordance with the Agreement between the Federal Atomic Energy Agency and the Chelyabinsk Region Government of 14.11.2006.»

G.1.5. Taking into Account Biological, Chemical and other Hazards that May be Associated with Spent fuel Management (Article 4 (v))

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- v) take into account the biological, chemical and other hazards that may be associated with spent fuel management;*

According to the Federal Law «On the Environmental Protection», main principles of the environmental protection are observance of the right of the humans for a favorable environment and mandatory environmental impact assessment when decisions are made concerning carrying out economic or other activities.

In accordance with this federal law, all factors of an adverse impact of the exercised activity that affect the environment, including its physical, chemical, biological and other parameters, should be taken into account in the course of planning and implementation of SNF management.

When decisions are made on realization of a SNF management activity, an impact assessment should be made which is aimed at identification, analysis and accounting of direct, indirect and other consequences of environmental impact of the planned activity.

A positive statement by the state review authorities is a mandatory condition of granting a siting, construction, operation and decommissioning license of SNF management facilities.

Biological, chemical and other risks associated with SNF management are insignificant as compared to radiological impact.

In terms of chemical impacts, the nuclear industry pertains to the industries that produce insignificant impact on the environment. The industry's share in chemical pollutant releases from stationary sources in Russia is less than 0.3%, in polluted water discharges — 0.6%, in production and consumption waste being generated – 0.8%.

Fire and explosion risks are subject to federal laws on fire safety, «Rules of Fire Safety in the Russian Federation» (PPB 01-03), Technical Regulation on Fire Safety Requirements, as well as federal norms and rules, safety guides (provisions) developed by Rostekhnadzor, which establish fire and explosion safety requirements and recommendations for fire and explosion safety at nuclear facilities, including in the course of SNF management, including for SNF re-processing processes.

Other risks are regulated by relevant regulations, including general industry regulations which establish requirements for limiting chemical, biological and other (non-radiation) impacts.

G.1.6. Analysis of Actions that Impose Predictable Impacts on Future Generations (Article 4 (vi))

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;*

The principle of protection of future generations is implemented through the fulfillment of requirements for the analysis of projected levels of radiation impacts to future generations resulting from SNF management; these levels should not exceed the permissible exposure levels for the population as established by the existing regulatory documents (Appendix E).

Legal provisions for environmental protection are stipulated in the Federal Law «On the Environmental Protection». Main principles of environmental protection are the observance of the human right for favorable environment and mandatory environmental impact assessment when making decisions on economic or other activities.

G.1.7. Minimization of Burdens on Future Generations (Article 4 (vii))

Article 4. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- vii) aim to avoid imposing undue burdens on future generations.*

The regulatory document requirements (Appendix E) stipulate that the undue burdening of future generations with the necessity to ensure safety during SNF management should be avoided.

The FTP «Nuclear and Radiation Safety» provides for solving a large number of accumulated problems related to reduction of burden on future generations (see section D).

G.2. Existing Facilities (Article 5)

Article 5. Existing Facilities

Each Contracting Party shall take the appropriate steps to review the safety of any spent fuel management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility.

The safety of SNF management facilities is ensured through achieving compliance with requirements of legislative and regulatory documents of the Russian Federation which govern activities in the field of the safety of SNF management and are determined when an operating license is granted.

In Russia the existing regulatory system for the siting, design, construction operation, maintenance and repair of SNF management facilities, as well as that of monitoring of a current safety level of facilities and review of their operational events allows to continuously ensure safety in the course of the SNF management at all stages.

All existing nuclear facilities and SF where SNF management is carried out have licenses granted by the Federal Environmental, Industrial and Nuclear Supervision Service for operation and handling of nuclear material. Operating licenses are granted after the safety assessment basing on results of the review and expert evaluation of submitted documents which justify safety of operation and results of inspection of safety ensuring at operation of the facility. A similar procedure is employed when license conditions are amended.

In the course of licensing reviews Rostekhnadzor conducts inspections to:

- assess safety ensurance directly at nuclear facilities and SF;
- check on credibility of the submitted information;
- assess the applicant's ability and availability of conditions for conduct of the declared activity.

According to requirements of the Federal Law «On the Use of Atomic Energy» (Article 35), the operating organization continuously monitors safety and submits safety information of nuclear facilities and SF to the state safety regulatory authorities.

In accordance with regulatory documents, the operating organization should continuously monitor all safety important activities at nuclear facilities and SF. In addition, during operation of the facility the operating organization should collect, process, analyze, systematize and store information on failures of components of safety important systems and erroneous actions of the employees (personnel). The operating organization should investigate operational events at nuclear facilities and SF, including accidents, and develop and implement measures aimed at recurrence of violations.

The operating organization also should prepare and submit to the state safety regulatory authority and to the body which control uses of atomic energy periodic safety reports of nuclear facilities and SF. All enterprises which operate installation for SNF management should provide annually such report as per provisions of the «Composition and Content of an Annual Report on Nuclear and Radiation Safety of Nuclear Fuel Cycle Facilities» (RB-043-08).

Therefore, operation of all SNF management facilities is carried out in accordance with Rostekhnadzor's license conditions granted to the operating organization and giving it the right to operate relevant installations, handle nuclear materials and transport SNF; meeting of these conditions is confirmed in the course of inspections.

To determine a volume of necessary engineering solutions and organizational measures aimed at improving safety of the SNF management facility, the operating organization carries out an analysis of its current safety level. Basing on results of this analysis, measures are developed and implemented to meet requirements of federal standards and rules.

When the facility approaches the end of its assigned (or 30-year) service life, the operating organization should carry out an assessment of a possibility of continuation of the facility operation in accordance with requirements of federal standards and rules.

G.3. Siting of Proposed Facilities (Article 6)

Article 6. Siting of Proposed Facilities

6-1 Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility:

- (i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;*
- (ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment;*
- (iii) to make information on the safety of such a facility available to members of the public;*
- (iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*

6-2 In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.

Siting of SNF management facilities and acknowledging the site as suitable for construction and safe operation of SNF management facilities is regulated by federal laws, federal norms and rules, guiding documents issued by Rostekhnadzor, construction norms and rules and other documents listed in section E. The main documents are:

- Federal Law «On the Use of Atomic Energy»;
- Federal Law «On the Environmental Protection»;
- Resolution by the Government of the Russian Federation № 306 of 14.03.1997 «On the Rules for Decision-Making on Siting and Construction of Nuclear Facilities, Radiation Sources and Storage Facilities»;
- NPP Siting. Basic Safety Criteria and Requirements (NP-032-01);
- Siting of Nuclear Fuel Cycle Facilities. Principal Criteria and Safety Assurance Requirements (NP-050-03);
- Accounting of External Natural and Man-Induced Events to Nuclear Facilities (NP-064-05).

According to the Federal Law «On the Use of Atomic Energy», a decision regarding siting and construction of nuclear facilities, RS and SF owned by the state or being of federal or interregional significance or sited and constructed in the territories of closed administrative territorial formations to which all RW management facilities pertain, are made by the Government of the Russian Federation in accordance with the procedure established by the Government of the Russian Federation.

Decisions regarding siting and construction of nuclear facilities, RS and SF are made with the account taken of an assessment of their impact on the environment.

Decisions regarding siting and construction of nuclear facilities, RS and SF were made and are made on the basis of statements of the state environmental review and taking account of outcomes of reviews conducted by non-governmental organizations.

Documents on the radiation impact assessment of a nuclear facilities, RS or SF, in a package with other necessary documents on the said nuclear facilities, should be submitted by the corresponding body that controls the uses of atomic energy or operating organization for the state environmental review.

A siting decision is taken with the consideration of:

- the need for the facility for the economics of the Russian Federation and its individual regions;
- the availability of conditions to site the above facilities, which should comply to the norms and rules in the field of use of atomic energy;
- the lack of threat to safety of a nuclear facility, radiation source or storage facility posed by nearby civil industrial facilities;
- possible social and economic consequences of siting of the above nuclear facilities for industrial, agricultural, social and cultural development of the region.

A study of natural and man-made conditions in the nuclear facilities, RS and SF siting region is conducted in accordance with:

- NPP Siting. Basic Safety Criteria and Requirements (NP-032-01);
- NPP Seismic Design Standards (NP-031-01);
- Accounting of External Natural and Man-Induced Events Impacts to Nuclear Facilities (NP-064-05)
- Siting of Nuclear Fuel Cycle Facilities. Principal Criteria and Safety Assurance Requirements (NP-050-03).

The above documents take into account recommendations of the following IEAE documents:

- ***NS-R-3. Site evaluation for Nuclear Installations (2003);***
- ***SSG-9. Seismic Hazards in Site Evaluation for Nuclear Installations (2010) (previous document Earthquakes and Associated Topics in Relation to Nuclear Power Plant Siting, Safety Series 50-SG-S1, 1994).***

At the stage of feasibility study of the nuclear facilities and SF construction survey work and research of processes, phenomena and factors capable of impacting nuclear facilities and SF safety are carried out.

In the course of the feasibility study/justification of nuclear facilities and SF project it should be confirmed that the site conforms with the set safety criteria:

- limitation of impacts of natural and man-induced processes, phenomena and factors revealed in the siting region and site of a newly sited nuclear facilities and SF, their unfavorable combinations taken into account;
- limitation of man-induced impacts on nuclear facilities and SF from existing nuclear facilities located near and on site of nuclear facilities and SF;
- limitation of radiation impact of nuclear facilities and SF on the population of the emergency planning zone and the environment considering contribution of the existing nuclear facilities located near and on site of nuclear facilities and SF;
- consideration of characteristics of the environment which facilitate transfer or accumulation of radioactive substances;
- ensurance of safe transportation of SNF, radioactive substances and RW;
- selection of sizes of the emergency planning zone and evacuation planning zones considering medical, biological, demographic and other characteristics of the region;

- creation of conditions for timely evacuation of the population;
- justification of a possibility to eliminate consequences of design basis and beyond design basis accidents, as well as to take prompt measures to prevent unauthorized actions towards nuclear facilities and SF.

The nuclear facilities and SF site is assessed for suitability in terms of nuclear facilities and SF safety assurance considering natural and man-induced processes, phenomena and factors, as well as in terms of safety assurance of the population and environment against radiation impacts during normal operation and design basis accidents.

It is not allowed to site nuclear facilities and SF within a territory which is not suitable for nuclear facilities and SNF SF as per environmental protection legislation and special requirements in the field of radiation safety of the population, civil defense and fire safety requirements for special-purpose buildings.

The content of the works executed in the process of engineering survey to study the natural conditions of the sites of nuclear facilities, is determined by the Ministry of Regional Development of the Russian Federation in coordination with Rostekhnadzor (the Decree of the Government of the Russian Federation of 19.01.2006 № 20).

G.4. Design and Construction of Facilities (Article 7)

Article 7. Design and Construction of Facilities

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

- (i) the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;*
- (ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;*
- (iii) the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.*

Design and construction of spent fuel management facilities is an activity subject to licensing and is regulated by Russian normative legislative basis (E.2.2).

Main principles and requirements to be met in the course of design and construction of nuclear facilities and SF are described in federal norms and rules:

- General Safety Provisions (NP-001-97, NP-033-01, NP-022-2000, NP-016-05,);
- NPP Seismic Design Standards (NP-031-01);
- Accounting of External Natural and Man-Induced Events Impacts to Nuclear Facilities (NP-064-05);
- Fire Safety Rules of the Russian Federation (PPB 01-03);
- Sanitary Rules «Hygienic Requirements for Design of Enterprises and Installations of Nuclear Industry» (SPP PUAP-03);
- Sanitary Rules of Design and Operation of Nuclear Power Plants (SP AES-03);
- SNF Dry Storage Facilities. Safety Requirements (NP-035-02);
- Spent Nuclear Fuel Reprocessing Facilities. Safety Requirements (NP-013-99).

In compliance with safety requirements a facility for RW management should be designed and built in such a way, that its radiation impact on personnel, public and environment during normal operation and operational events, including design basis accidents, should not result in exceeding normative levels of exposure of the personnel and the public, normative levels of releases and discharges of radioactive substances and concentration of radioactive substances in the environment.

The requirements of the federal norms and rules (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-11) determine that organizational and technical measures for the design and construction of SNF management facility should be performed with the consideration of its future decommissioning.

Technical and organizational approaches used to ensure safety of SNF management facilities should be justified by the previous experience or by tests, studies, and experience in operation of prototypes. This approach is used in the design of the facilities, development and manufacture of the equipment, construction, renovation and upgrading of its systems (components).

In case at any stage of the construction of a facility some additional factors are revealed, which may result in decreasing the safety level of the facility, or which may affect the environment or result in any unfavorable consequences, the construction should be stopped or suspended. The proposals for the review of the decision on construction may be put forward by the state authorities, by the local government and non-governmental organizations (associations).

The FTP «Nuclear and Radiation Safety» plans for establishing a Pilot demonstration center for SNF reprocessing using innovative technologies with a production capacity of up to 100 tons/year at MCC. The PDC is assumed to experimentally verify and test several SNF reprocessing technologies. In 2010 the state review authority granted a positive statement regarding the PDC project.

At MCC a dry storage facility for SNF of RBMK-1000 reactors is under construction and a dry storage facility for SNF of WWER-1000 reactors is planned.

G.5. Assessment of Safety of Facilities (Article 8)

Article 8. Assessment of Safety of Facilities

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

- (i) before construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;*
- (ii) before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).*

According to the legislation of the Russian Federation, when a decision is made concerning siting and construction of a nuclear facility (in particular, a SNF management facility), a mandatory condition is to carry out an integrated safety assessment of the facility and assessment of its impact on the environment, which should be commensurate with the risk associated with the facility and covering the entire period of its operation.

A mandatory condition of obtaining a license to carry out a planned activity is a positive statement by the state environmental review. A package of documents subject to the state

environmental review should include materials of the environmental impact assessment of the planned activity.

The statement by the state environmental review should be submitted to Rostekhnadzor within a package of justification documents intended for obtaining a license for construction and operation of a SNF management facility.

Within the package of documents necessary to obtain a Rostekhnadzor license an applicant should provide documents which justify nuclear and radiation safety of the facility and (or) declared activity; requirements to composition of such documents are established by Rostekhnadzor depending on a type of facility and activity subject to licensing.

In case of siting of a SNF management facility, a preliminary safety analysis report should be submitted. Such report should contain all justifications, as required by applicable regulatory documents, of the selected site, description of all aspects related to safety, general description of the facility and its safety for the environment and public, including a preliminary analysis of safety and physical protection.

In case of construction of a SNF management facility, a safety analysis report with a detailed safety analysis should be provided.

Siting and operation license conditions for a SNF management facility may include, as necessary, requirements for development and implementation of measures to rectify and (or) compensate for non-conformities of the SNF management facilities with requirements of regulatory documents, elimination and (or) compensation for issues outlined in the review statement on the facility safety. Corrective measures may include re-assessment or more detailed assessment of the safety, execution of a program of additional surveys and studies, as well as amendment of the facility safety justification in accordance with issues raised by the review process, outcomes of inspections and with consideration of other revealed factors affecting the facility safety; also, due dates of implementation of such measures and submission of related implementation reports to Rostekhnadzor may be also included.

G.6. Operation of Facilities (Article 9)

Article 9. Operation of Facilities

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

- (i) the license to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;*
- (ii) operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;*
- (iii) operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;*
- (iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;*
- (v) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;*
- (vi) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;*
- (vii) decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.*

G.6.1. Safety Justification and Granting of Operating Licenses for SNF Management Facilities after Construction

The procedure for obtaining licenses to operate SNF management facilities is defined in the «Procedure for Licensing of Activities in the Field of the Use of Atomic Energy» Resolution of the Government of the Russian Federation № 865 of 14.07.1997). A decision on granting the SNF management facility operating license is made by Rostekhnadzor after the operating organization submits license application documents.

A composition of documents justifying nuclear and radiation safety of nuclear facilities, and SNF SF being commissioned after construction is defined by the Administrative Regulation for the Federal Environmental, Industrial and Nuclear Supervision Service's execution of the state function of licensing of activities in the field of the use of atomic energy (№ 262 of 16.10.2008). To obtain an operating license, the operating organization submits the following main documents:

- safety analysis report;
- quality assurance program during operation of nuclear facilities, SF;
- information on recruitment, training, maintaining skills and permits to work independently of the employees;
- accident elimination procedure;
- beyond design basis accident management guide;
- plan of personnel protection measures in case of an accident;
- nuclear safety procedure for storage, transportation and reloading of nuclear fuel;
- record of control and accounting of nuclear materials and (or) radioactive waste;
- record of physical protection arrangements;
- nuclear facilities and SF commissioning program;
- Operating procedures for main process systems of the nuclear fuel storage facility.

Operation of nuclear facilities and SNF SF is allowed only after all startup and alignment works have been completed and integrated system (component) run has been carried out and provided there is a Safety Analysis Report, as revised considering results of startup and alignment works and the integrated run of systems (components).

G.6.2. Setting and Updating Safe Operation Limits and Conditions

Basing on documentation written by designers of the equipment, processes and design, the operating organization before the integrated run of systems (components) should develop operating documentation of nuclear facilities and SNF SF.

The operating documentation contains rules and main approaches to safe operation, general safety related operation procedures, safe operation limits and conditions, specific instructions to employees (personnel) on to how to perform in normal operation and operational events, including pre-accident states, employees' (personnel's) actions to ensure safety in design basis and beyond design basis accidents.

The operating documentation is updated basing on the facility commissioning results.

A procedure for keeping, storing and revising the operating documentation is established by the operating organization with account taken of regulatory document requirements.

Frequency of safety assessments of the facility, which provide for confirmation or revision of the safe operation limits and conditions (considering operating experience and technical support conditions), is determined by a nature of the facility operation and conditions; this safety assessment is carried out each time when it is necessary to renew the license (issue another license), as well as in case of substantial modernization, refurbishment etc. which necessitate amending the license conditions.

Before introducing changes to the operating documentation, which affect safety of the facility, the updated safety documentation (reports, supplements etc.) is submitted to Rostechнадзор for review and decision-making on changing the license conditions.

G.6.3. Regulation of Maintenance and Repairs, Inspection and Testing of Nuclear Facilities

To keep up safety important systems operable, they are maintained, repaired, tested and checked. The said work is carried out in accordance with the corresponding operating documentation, programs and schedules generated in accordance with the procedure established by the operating organization basing on design requirements.

Basing on the existing regulatory and institutional documents, the enterprise administration drafts a specific maintenance and repair program for which implementation the maintenance and repair schedules are generated and approved.

The operating organization should carry out planned preventive and (or) capital repairs of equipment of nuclear facilities and SF related to SNF management as per their schedules.

The work is carried out in accordance with procedures for maintenance and repairs of safety important systems and as per a schedule approved by the enterprise administration.

In the course of execution of work related to operation of a SNF management facility, in particular, maintenance and repair, the operating organization should ensure that this work is carried out by the personnel of appropriate qualification and involve for execution of the work and rendering of service the organizations which have relevant licenses to execute this work.

After the maintenance and repairs the system components and systems themselves are subjected to performance tests and checks for compliance with design characteristics, check results being documented.

Normally, safety important systems (components) are subjected to a direct and comprehensive check as to their compliance with design indicators at the commissioning, after repair and periodically throughout the entire service life of nuclear facilities and SF related to SNF management.

A necessity of unscheduled maintenance and repair of equipment and systems is determined by results of monitoring of their conditions.

During operation oversight and monitoring by Rostechнадзор, as well as departmental oversight and inspections are carried out.

G.6.4. Engineering, Technical and Scientific Support of Operation

The operating organization over the entire life of a SNF management facility should provide for a necessary scientific and engineering support on its own and with involvement of out-sourced contractors.

At stages of nuclear facilities and SF construction, commissioning, operation and decommissioning, types and ways of technical and engineering support vary depending on tasks the operating organization and specific facility are facing.

According to the federal Law «On the Use of Atomic Energy» Article 37, organizations which carry out scientific research and surveys, design, construction and decommissioning of nuclear facilities and SF, design and manufacture equipment thereof, other work and rendering services in the field of the use of atomic energy ensure execution of work and rendering services in an amount and of quality which meet norms and rules in the field of the use of atomic energy and bear responsibility for quality of executed work and rendered services during the entire design service life of a nuclear facilities or SF or equipment manufactured thereof. The body controlling the uses of atomic energy recommends an organization responsible for design of a nuclear facilities or SF.

As a rule, the operating organization involve specialist research, development, repair, adjustment and other organizations, and nuclear facilities and SF equipment producers in performance of necessary work and rendering necessary services, provided they have appropriate experience and licenses for rendering services in the field of the use of atomic energy.

G.6.5. Accounting of Nuclear Facilities and SF Safety Significant Operational Events

According to requirements of the Federal Law «On the Use of Atomic Energy», the operating organization continuously controls over safe operation of the nuclear installation at all its life stages.

At present, the analysis and accounting of nuclear facilities and SF operational events, including safety significant ones, is regulated by:

- Provisions regarding investigation and accounting procedures of operational violations (NP-004-97, NP-047-11, NP-27-01 and other),
- General Safety Provisions (NP-001-97, NP-033-01, NP-016-05),
- Departmental documents of the operating organization which regulate procedures for nuclear facilities and SF operational event investigation and accounting.

The facility operational events, including accidents, are duly investigated. The operating organization should develop and implement measures aimed at prevention of event recurrence. The operating organization should provide for operational event information of the state nuclear safety regulatory body.

Findings of investigation into operational events at nuclear facilities or SF should be kept throughout its service life.

The control and inspection system being implemented by the operating organization is aimed at an early detecting and preventing deficiencies in the facility performance and their timely elimination.

G.6.6. Nuclear Facilities and SF Operating Experience Information Collection and Analysis

During operation of nuclear facilities and SF, the operating organization should duly collect, process, analyze, systematize and store information on nuclear facilities and SF operating experience, failures of safety important system components and erroneous actions of em-

ployees (personnel), violations of safe operation limits and conditions and ensure prompt transfer of such information to the organizations which have necessary authorities for subsequent analysis.

The operating organization should ensure storage of the design documentation of a NFC facility, executive documentation for maintenance and repair of safety systems (components) and safety important components throughout the service life of the facility, and some documents, until the end of the facility decommissioning.

G.6.7. Decommissioning program

Organizational and technical measures in the course of design, construction and operation of nuclear facilities and SF should be carried out having in mind its eventual decommissioning.

The Federal Law «On the Use of Atomic Energy», federal norms and rules in the field of the use of atomic energy establish requirements for SNF management facility decommissioning.

According to «Provisions for Licensing of Activities in the Field of the Use of Atomic Energy» Article 18, in the process of granting a license for siting, construction and operation of nuclear facilities or SF and review of the document package justifying nuclear and radiation safety if nuclear facilities or SF and (or) declared activity, Rostechнадзор compulsory analyzes an ability of the applicant to ensure safe termination of the declared activity and decommissioning of the nuclear facility, as well as availability of related design materials.

Decommissioning should be carried out in accordance with a decommissioning program and project.

Decommissioning of nuclear facilities or SF should be preceded by an integrated engineering and radiation survey.

Basing on the survey materials, the operating organization develops a decommissioning project of nuclear facilities or SF and prepares a decommissioning safety analysis report.

The decommissioning program and project should be developed considering modernizations carried out and consequences of incidents occurred.

nuclear facilities or SF shut down for decommissioning are considered as being in operation until nuclear materials have been removed from its systems (components). All requirements set forth for a facility in operation are valid during this period of time.

G.7. Disposal of spent fuel (Article 10)

Article 10. Disposal of Spent Fuel

If, pursuant to its own legislative and regulatory framework, a Contracting Party has designated spent fuel for disposal, the disposal of such spent fuel shall be in accordance with the obligations of Chapter 3 relating to the disposal of radioactive waste.

Presently, disposal of spent fuel in the Russian Federation is not carried out.

The FTP «Nuclear and Radiation Safety» plans a study of disposal possibilities for non-reprocessable SNF, including:

- development of assessment criteria and methodology of a geological host environment and a site selection for a disposal facility for non-reprocessable SNF, a safety assessment

methodology of SNF underground storage facilities, as well as radionuclide migration models in geological environment;

- integrated geological studies.

Section H. Safety of Radioactive Waste Management

H.1. General Safety Requirements (Article 11)

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- (i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;*
- (ii) ensure that the generation of radioactive waste is kept to the minimum practicable;*
- (iii) take into account interdependencies among the different steps in radioactive waste management;*
- (iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;*
- (v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;*
- (vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;*
- (vii) aim to avoid imposing undue burdens on future generations.*

In the Russian Federation safety of RW management is regulated by federal laws, of which the Federal Law «On the Use of Atomic Energy» is of fundamental importance.

Article 48 of this Federal Law states that in the storage or disposal of radioactive waste must be reliably isolated from the environment, and the present generation and future generations and biological resources must be protected against exposure to radiation above the limits laid down by the rules and regulations in the sphere of the use of atomic energy.

The Russian Federation regulatory basis provides for measures to ensure that the personnel, population and environment are reliably protected against radiation impact incurred by related handling at all stages of RW management (collection and sorting, conditioning, storage, transportation, disposal).

Basic requirements for RW management are established by the following federal laws and federal norms and rules:

- Federal Law «On the use of Atomic Energy»;
- Federal Law «On the Radioactive Waste Management»;
- Federal Law «On the Radiation Safety of the Public»;
- Federal Law «On the Environmental Protection»;
- Radiation Safety Standards (NRB-99/2009);
- Basic Sanitary Rules of Radiation Safety (OSPORB-99/2010);
- Sanitary Rules of the Radioactive Waste management « (SPORO-2002);
- General Safety Provisions of nuclear facilities, RS and SF (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-058-04, NP-038-11);
- Accounting of External Natural and Man-Induced Impacts on Nuclear Facilities (NP-064-05);
- Safety at Radioactive Waste Management. General Provisions. (NP-058-04);

- Collection, Reprocessing, Storage and Conditioning of Liquid Radioactive Waste. Safety Requirements. (NP-019-2000);
- Collection, Reprocessing, Storage and Conditioning of Solid Radioactive Waste. Safety Requirements. (NP-020-2000);
- Disposal of Radioactive Waste. Safety Principles, Criteria and Main Requirements. (NP-055-04);
- Near-Surface Disposal of Radioactive Waste. Safety Requirements. (NP-069-06).

A complete list of regulations is given in Appendix E.

According to NP-058-04, safety objectives of the RW management are:

- reliable protection of the personnel and population against radiation impacts from RW above safety levels established by radiation safety standards;
- reliable isolation of RW from the environment, protection of the present and future generations, biological resources against radiation impact above limits established by radiation safety standards;
- prevention of environmental releases (discharges) during RW management in quantities exceeding maximum permissible releases (discharges).

H.1.1. Criticality and Residual Heat Removal (Article 11 (i))

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- (i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;*

Nuclear safety in the course of collection, reprocessing, storage and conditioning of RW containing nuclear hazardous fissile materials is regulated by federal norms and rules in the field of use of atomic energy which define rules of nuclear safety (NP-063-05, NP-019-2000, NP-020-2000, NP-021-2000, NP-058-04 and other).

Federal norms and rules in the field of safe management of RW pay proper attention to criticality and removal of residual heat generated in course of RW management.

According to NP-019-2000, NP-020-2000, NP-021-2000, design and geometrical sizes of the equipment intended for collection, reprocessing, storage and conditioning of RW, content of nuclear hazardous fissile materials in conditioned RW and geometry of its packages, as well as handling procedures should exclude initiation of SCR.

Premises where the equipment for collection, reprocessing, storage and conditioning of RW containing nuclear hazardous fissile materials is located should be fitted with automated alarm systems which should be ready to detect SCR at all times. SRW containing nuclear hazardous fissile materials, which compression can lead to SCR, should not be subjected to compaction.

In case of disposal of RW (NP-058-04) containing nuclear fissile substances (material) there should be engineering solutions and organizations measures in place that are aimed at prevention of SCR initiation. Properties of engineering and natural barriers should exclude SCR

due to possible concentration of radionuclides in the course of their migration within the RW disposal system.

The «Sanitary Rules of Radioactive Waste Management» (SPORO-2002) stipulate that heat release by primary waste should be considered when selecting forms of RW conditioning. A volume of conditioned RW should be minimal as conditioned, in particular, by specific heat release and heat removal conditions.

In case of RW disposal, the host rock should withstand heat impact of heat-releasing RW, retain their isolating properties and provide for heat conditions that do not lead to degradation of the engineering barriers integrity in the radioactive waste deep geological disposal facility.

H.1.2. Minimizing of Radioactive Waste Generation (Article 11 (ii))

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

ii) (ii) ensure that the generation of radioactive waste is kept to the minimum practicable;

The Russian regulations establish requirements according to which generation and accumulation of RW in the course of RW management should be kept at the minimum practicable level (the principle of control over RW generation).

According to NP-016-05, NO-058-04 and other, the operating organization should ensure implementation of the following measures to reduce RW generation and prevent its accumulation:

- timely reprocessing and conditioning of RW;
- prevention of unplanned accumulation of RW;
- limitation of RW generation to a minimum practicable level;
- establishment of norms for generation of liquid and solid RW and periodically revise these norms with an account taken of RW management best practices achieved;
- prevent storage of unconditioned RW which is not provided in the project or operating documentation;
- prevent releases (discharges) of radionuclides in excess of limiting permissible values.

A requirement has been set forth that during design and operation of nuclear facilities, RS and SF it is necessary to provide conditions (engineering solutions and organizational measures) where a minimum practicable quantity of RW is generated.

Specific engineering solutions, means and organizational measures to minimize RW quantities should be developed and implemented during the elaboration of design and operating documentation for RW management facilities.

To achieve a significant reduction of RW volumes it is planned to build a number of new RW conditioning and reprocessing facilities at nuclear power plants described in section B.

The work to develop and build RW management facilities which would minimize volumes of RW are carried out in the framework of the FTP «Nuclear and Radiation Safety», including:

- development of a complex for SRW reprocessing at PA Mayak;
- construction of a low-level RW clean-up facility at PA Mayak;
- construction of a combined sewerage system at PA Mayak;

- construction of a facility for treatment of organic LRW at SCC and other.

H.1.3. Interdependence among Different Steps of RW Management (Article 11 (iii))

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

(iii) take into account interdependencies among the different steps in radioactive waste management;

The Russian regulations in the field of RW management including phases of their collection, segregation, processing, conditioning, storage, transportation and disposal (NP-058-04, NP-019-2000, NP-020-2000, NP-053-04, NP-055-04, NP-069-06) establish requirements under which the principle of consideration of interdependencies among steps of RW generation and management should be taken into account.

According to the documents listed below the compliance with the following requirements provide taking into account different stages of RW generation and RW management:

- receiving reliable and complete information about the quantitative and qualitative composition of RW at sites of their generation, collection, processing, storage and conditioning;
- quality control organization for technological processes of collection, processing, storage and conditioning of RW, RW quality control and testing of RW packages;
- establishment of RW quality criteria system which the RW have to meet after their collection, processing, storage and conditioning;
- establishment of RW eligibility criteria for waste disposal and control of RW compliance with these criteria;
- organization of an effective system of records and documentation storage during RW collection, processing, storage, conditioning and disposal.

The Federal Law «On the Radioactive Waste Management» defines the interdependency of the radioactive waste generation stage and stages of RW management as a functional principle of the USS RW.

To implement this principle, the law obliges RW generators to bring RW in compliance with the acceptability criteria within interim storage period of RW and transfer it to the national operator for disposal. Also, the law establishes requirements for management of accumulated RW and its storage facilities.

The FTP «Nuclear and Radiation Safety» provides for solving a large number of tasks to eliminate problems occurred in the past due to breaks of interdependencies between different stages of RW management (see section B). A number of especially hazardous facilities built in the past will be rendered safe: by 2015 mothballing of the most contaminated industrial reservoir V-9 (Lake Karachai) at PA Mayak is planned; mothballing of industrial reservoir V-17 (Staroye Boloto) – by 2025. It is also planned to solve delayed problems at MCC and SCC (including mothballing of reservoirs B-1, B-2, B-25, slurry storages PKh-1, PKh-2 and other).

H.1.4. Protection of Individuals, Society and Environment (Article 11 (iv))

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

The Russian regulations establish requirements under which at all stages of RW management (mining and processing of ores of radioactive substances and other minerals, collection, reprocessing, storage and disposal of RW) the principles of ensuring acceptable levels of protectiveness of workers (personnel) and population against radiation impact from RW should be observed in accordance with the principles of justification, dose limitation and optimization (the principle of protection of human health) and the principles of ensuring acceptable levels of protectiveness of the environment against adverse radiation impact of RW (the principle of the environmental protection).

The main objective of ensuring safety of a RW management facility is the protection of employees (personnel), population and environment against its radiation impact.

Measures to protect individuals, society as a whole and environment in the course of RW management are generally similar to those described in section G.1.4.

In the course of management of RW accumulated in the surface reservoirs – LRW storage reservoirs and tailing dumps – there are engineering means and organizational measures in place to prevent exposure of employees (personnel) and population in excess of levels established by radiation safety standards, contamination of the environment, including contamination of surface water reservoirs and ground water with radionuclides, transfer of radioactive aerosols by wind, dust formation and dust losses of radionuclides.

The Federal Law «On Special Environmental Programs for Rehabilitation of Radiation-Contaminated Sections of Territories» provides for special measures to ensure radiation safety of the population, reduction of general risk of radiation impact and improvement of the ecological situation at radiation-contaminated sections of territories (see section G).

H.1.5. Taking Account of Biological, Chemical and other Risks that May be Associated with Radioactive Waste Management (Article 11 (v))

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

Measures being undertaken in the Russian Federation to address biological, chemical and other risks that may be associated with RW management are generally similar to the measures described in section G.1.5 for SNF management.

In the process of RW disposal, biological, chemical and other risks are taken account of through establishing RW acceptability criteria for disposal. Existing federal norms and rules for RW disposal (NP-055-04, NP-069-06) stipulate that the design of a RW disposal facility should define RW acceptability criteria for disposal considering a content of harmful substances, chemically toxic substances, pathogenic and infectious materials.

The Russian Federation has accumulated good practices in addressing the problem of radiation safety, preventing environmental damage due to radioactive and chemical waste disposal as well as the provision of a reliable isolation during LRW disposal by controlled pumping into deep geological layer-collectors. Accumulated experience as well as calculation and observation results show that the deep disposal of liquid radioactive waste provides a long-term isolation, chemical and biological risks reduce within the projected time due to decomposition of organic pollutants. Radio-ecological monitoring of the environment (water, air, soil, vegetation), which includes in addition to radiation factors control, control of their pollution by chemicals is carried out at storage sites designed for large amounts of RW (water reservoirs – LRW storage facilities, tailing dumps, deep storage facilities for LRW and SRW storage facilities), control areas and environment.

H.1.6. Analysis of Actions that Have Predictable Consequences for Future Generation (Article 11 (vi))

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;*

The principle of protection of future generations is implemented through meeting requirements for an analysis of projected levels of radiation impacts on future generations due to RW management; these levels should not exceed permissible exposure levels of the population, as established by the existing regulations (Appendix E).

Basic principles of the environmental protection established by the Federal Law «On the Environmental Protection» are observance of the human right for a favorable environment and mandatory environmental impact assessment in making decisions on an economic or other activity.

The Federal Law «On the Radioactive Waste Management and on Introducing Changes to Separate Legal Acts of the Russian Federation» gives priority to the protection of human health and life, current and future generations, and environment against adverse impacts of RW as a functional principle of the USS RW.

According to the federal norms and rules (NP-058-04), one of the main objectives is a reliable isolation of LRW and SRW from the environment, protection of current and future generations, and biological resources against radiation impacts that exceed limits established by radiation safety standards.

NP-058-04 stipulates that in the course of RW management, the following principles should be observed in respect of future generations:

- projected exposure levels to future generations due to disposal of RW should not exceed permissible exposure levels of the population established existing regulatory documents (the principle of protection of future generations);
- avoidance of imposing an undue burden to future generations related to ensuring safety in the course of RW management (the principle of avoidance of imposing an undue burden on future generations).

The Federal Law «On the Radioactive Waste Management and on Introducing Changes to Separate Legal Acts of the Russian Federation» provides for development of a unified state system for RW management; one of the main principles of this system is the priority of protection of human health and life, current and future generations, and environment against adverse impacts of RW.

H.1.7. Minimization of Burdens to Future Generations (Article 11(vii))

Article 11. General Safety Requirements

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

vii) aim to avoid imposing undue burdens on future generations.

The Federal Law «On the Radioactive Waste Management and on Introducing Changes to Separate Legal Acts of the Russian Federation» provides for organizational and financial mechanisms to develop a RW disposal system that would exclude imposing an undue burden on future generations and adverse ecological consequences associated with RW accumulated and not isolated from the environment, and ensure timely and safe management of newly generated RW, including its disposal.

Avoidance of imposing an undue burden on future generations associated with safety ensuring in the course of RW management is also determined by requirements of regulatory documents (Appendix E).

The FTP «Nuclear and Radiation Safety» provides for solving many of accumulated problems related to reduction of burdens on future generations. Funds of RUR29.7bn are allocated to deal with key facilities of RW management (see section D).

A number of especially hazardous facilities built in the past will be rendered safe, including industrial reservoirs V-9 (Lake Karachai) and V-17 (Staroye Boloto) at PA Mayak. It is also planned to solve delayed problems of RW management at MCC and SCC.

H.2. Existing Facilities (Article 12)

Article 12. Existing Facilities and Past Practices

Each Contracting Party shall in due course take the appropriate steps to review:

- (i) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;*
- (ii) the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.*

Federal norms and rules provide corresponding measures of safety ensuring at the existing RW management facilities, including storage facilities for accumulated RW.

Procedures for licensing and amending of license conditions of the existing RW management facilities that are currently under operation is generally similar to that described in section G.2.

In addition, according to the Russian regulations, a current safety level analysis and projection calculations for safety assessment of the RW storage system should be conducted to identify the necessity of technical solutions implementing and organizational measures aimed at improvement of safety of the existing RW storage facilities. Results of such analysis and projection calculations should be laid as the basis for implementation of all reasonably practicable measures aimed at meeting the requirements of norms and rules.

When deciding on implementation of protective measures (intervention) aimed at safety enhancement at accumulated RW storage facilities, one should be guided following principles established in NRB-99/2009:

- planned intervention should incur more benefit for the society and, in the first place, for exposed individuals than harm, i.e. a reduction of damage due to the dose reduction should be sufficient to justify harm and costs of the intervention, including its social costs (the principle of justification of the intervention);
- forma, scale and duration of the intervention should be optimized so that the net benefit of the dose reduction, i.e. the benefit of reducing the radiation damage, the damage due to the intervention deducted, should be maximum (the principle of optimization of the intervention).

The Federal Law «On the Radioactive Waste Management and on Introducing Changes to Separate Legal Acts of the Russian Federation» provides for activities related to rendering accumulated «legacy» RW resulted from past operations environmentally safe.

The law stipulates that when making decisions on plans for management of accumulated RW it is necessary to compare risks associated with a radiation impact or other risks, as well as expenditures incurred by its retrieval from the storage facility and subsequent management including disposal, with risks and costs associated with leaving the waste in the place of its location.

Currently, operation of RW management facilities (including those within nuclear facilities, RS and SF) is carried out in accordance with operating licenses and license conditions.

The FTP «Nuclear and Radiation Safety» provides for solving a large number of tasks to improve and modernize RW management facilities aiming at safety improvement and reducing of risks of adverse impacts, including:

- buildings for placing electric furnaces EP-500/5 and vitrified RW storage facility, equipment for reprocessing of accumulated LRW at PA Mayak;
- RW management complex at IPPE;
- system for management of accumulated RW at FSUE PA Sevmash.

H.3. Siting of Proposed Facilities (Article 13)

Article 13. Siting of Proposed Facilities

13-1 Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:

- (i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;*
- (ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;*
- (iii) to make information on the safety of such a facility available to members of the public;*
- (iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*

13-2 In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 11.

The Federal Law «On the Use of Atomic Energy», Federal Law «On the Environmental Protection», Urban Planning Code, Decree of the Government of the Russian Federation «On the Rules for Decision-Making on Siting and Construction of nuclear facilities, RS and SF», federal norms and rules (NP-050-03, NP-055-04, NP-032-01 and other) are the main regulatory documents which regulate the procedure and requirements for selecting a site for proposed RW management facilities.

According to the Federal Law «On the Use of Atomic Energy», a decision on siting and construction of nuclear facilities, RS and SF owned by the state or of federal or regional significance or sited and constructed in the territory of closed administrative territorial formations are made by the Government of the Russian Federation in accordance with the procedure established by the Government of the Russian Federation.

Decisions on siting and construction of nuclear facilities, RS and SF are made with an account taken of the environmental impact assessment.

Decisions on siting and construction of nuclear facilities, RS and SF are made basing on results of the state environmental reviews and considering conclusions of reviews carried out by non-governmental organizations.

In pursuance of the Federal Law «On the Environmental Reviews» a siting decision is made after a mandatory state environmental review.

The procedure provided by the law assumes meeting of the following principles:

- comprehensiveness of an environmental impact assessment of an economic or other activity and its consequences;
- publicity, involvement of non-governmental organizations (associations) and consideration of the public opinion in decision-making.

Decision-making on siting and construction of nuclear facilities, RS and SF is carried out considering an assessment of their radiation impact on the environment.

Documents of an environmental impact assessment of nuclear facilities, RS and SF, along with other necessary project documents for the said nuclear facilities are submitted by a relevant body that controls uses of atomic energy or operating organization for the state environmental review.

A siting decision is made taking account of:

- needs in them to solve economic tasks in the Russian Federation and its individual regions;
- availability of conditions for siting the said facilities that meet norms and rules in the field of the use of atomic energy;
- absence of a threat to the safety of the RW management facility, storage facility from nearby civil industrial facilities;
- possible social and economic consequences of siting of the said nuclear facilities for the industrial, agricultural, social, cultural and residential development of the region.

The regulatory document «Disposal of Radioactive Waste. Principles, Criteria and Main Safety Requirements» establishes principles, criteria and main safety requirements for RW near-surface disposal, RW disposal in deep geological formations, as well as for LRW disposal. A RW disposal facility (RWDF) (LRW deep disposal facility (LRW DDF)) meets post-closure safety requirements if:

- during normal (evolutionary) pace of natural processes on the RWDF (LRW DDF) site (most likely scenarios of the evolution of the RW disposal system) its radiation impact does not lead to exceeding of the annual effective dose limit above the quota established for the disposal;
- under unlikely (catastrophic) natural and man-induced external impacts on the site of RWDF (LRW DDF) (unlikely scenarios of radionuclide migration from the RW disposal system) the individual total risk limit equal to $1.0 \times 10^{-5} \text{ year}^{-1}$ for the critical group of the public is not exceeded.

Sufficiency of technical solutions to ensure safety adopted in the design of the RWDF (LRW DDF) should be justified in the first place for the entire period of the potential danger of disposed RW taking account of possible natural and man-induced external impacts in the RWDF (LRW DDF) siting region as well as taking account of physical and chemical processes which occur in the RWDF (LRW DDF).

According to section 3.1 of the document, a site is considered suitable for placing a RW disposal facility (RWDF) if there is a possibility of ensuring safe disposal of RW considering natural phenomena, processes and factors of natural and man-induced origin. A RWDF site selection should be justified in the project basing on results of an analysis of surveys and studies carried out in the region of the planned site and projection calculation made to assess safety of the RW disposal system.

It is not permitted to site RWDF in regions with intensive ground motion, high seismic and volcanic activity, as well as in regions featuring extensive industrial activities, extraction of minerals, including within boundaries of quarries, mine fields, control areas of ground water intakes, mineral deposits.

Rostechнадзор carries out an analysis of whether the siting conditions are met and whether the surveys and studies that have been carried out are sufficient when making a decision on issuing a siting license for a RW management facility.

H.4. Design and Construction of Facilities (Article 14)

Article 14. Design and Construction of Facilities

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

- (i) the design and construction of a radioactive waste management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;*
- (ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;*
- (iii) at the design stage, technical provisions for the closure of a disposal facility are prepared;*
- (iv) the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.*

Design and construction of facilities for RW management is regulated by the following federal norms and rules in the field of the use of atomic energy:

- General Safety Provisions of Nuclear Fuel Cycle Facilities. NP-016-05 (OPB OYaTTs);
- Safe Management of Radioactive Waste. General Provisions. NP-058-04;
- Collection, Reprocessing, Storage and Conditioning of Liquid Radioactive Waste. Safety Requirements, NP-019-2000;
- Collection, Reprocessing, Storage and Conditioning of Solid Radioactive Waste. Safety Requirements. NP-020-2000;
- Management of Gaseous Radioactive Waste. Safety Requirements, NP-021-2000;
- Disposal of Radioactive Waste. Principles, Criteria and Main Safety Requirements, NP-055-04;
- Near-Surface Disposal of Radioactive Waste. Safety Requirements, NP-069-06.
- Basic Sanitary Rules of Radiation Safety (OSPORB-99);
- Sanitary Rules of Design and Operation of Nuclear Power Plants (SP AS-03);
- Sanitary Rules of Radioactive Waste Management (SPORO-2002).

According to the safety requirement, a RW management facility (before RW disposal) should be designed and constructed so that its radiation impact on the personnel, public and environment in normal operation, including design basis accidents, should not lead to exceeding of established exposure dose limits for the personnel and public, guidelines for releases and discharges of radioactive substances and contents of radioactive substances in the environment.

The federal norms and rules requirements stipulate that organizational and engineering measures in the course of design and construction of a RW management facility should be carried out with an account taken of its future decommissioning (closure).

Technical and engineering solutions made to ensure safety of RW management facilities should be verified by previous experience or tests, studies, experience in operation of prototypes. This approach should be used in design of facilities, development and manufacture of equipment, construction, renovation and modernization of systems (components).

The design and operating documentation should include specific engineering solutions and organizational measures to ensure safety at management of RW pertaining to each category.

The design documentation can be approved provided there is a sanitary and epidemiological statement issued by the state sanitary and epidemiological regulatory bodies.

H.5. Assessment of Safety of Facilities (Article 15)

Article 15. Assessment of Safety of Facilities

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

- (i) before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;*
- (ii) in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;*
- (iii) before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).*

According to the legislation of the Russian Federation, when making a decision on siting and construction of a nuclear facility (in particular, a RW management facility), a mandatory condition is a comprehensive assessment of the facility safety and assessment of a radiation impact of the environment, which should be commensurate to the risk associated with the facility and cover the entire period of its operation.

A mandatory condition to obtain a permit for the planned activity is a positive statement issued by the state environmental review. A package of documents subject to the state environmental review should include an environmental impact assessment of the planned activity.

The state environmental review statement should be submitted to Rostekhnadzor as a part of the justification document package required for obtaining a license for construction or operation of a RW management facility.

To obtain a Rostekhnadzor's license, the Applicant should also submit, as a part of the license application, the documents justifying safety of the facility and (or) declared activity; requirements for composition of these documents are established by Rostekhnadzor depending on a type of the facility or activity being licensed.

In case of siting of a RW management facility, the submission should include a preliminary safety analysis report containing all justifications (as required by the regulatory documents) of the selected site and covering safety related aspects, a general description of the facility and its safety for the environment and population, including a preliminary safety analysis and physical protection.

In case of construction of a RW management facility, a safety justification report with a detailed safety analysis should be submitted.

License conditions for siting and operation of a RW management facility may include, as necessary, requirements for development and implementation of measures to eliminate and (or) compensate for nonconformance of the RW management facility to requirements of regulatory documents, elimination and (or) compensation for issues raised in the review statement on the facility safety, which may include reassessment or more detailed assessment of safety, conduct of a program of additional surveys and studies, as well as updating the safety justification of the facility basing on the review findings, inspection results and other revealed factors affecting safety with indication of their dates of implementation and submission of implementation reports to Rostekhnadzor.

The federal norms and rules requirements stipulate that organizational and engineering measures before construction of a RW management facility should be carried out with an account taken of its future decommissioning (closure).

H.6. Operation of Facilities (Article 16)

Article 16. Operation of Facilities

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

- (i) the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;*
- (ii) operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary;*
- (iii) operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;*
- (iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;*
- (v) procedures for characterization and segregation of radioactive waste are applied;*
- (vi) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;*
- (vii) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;*
- (viii) decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;*
- (ix) plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.*

H.6.1. Safety Justification and Granting of Operating Licenses for RW Management Facilities

The procedure for obtaining licenses for operation of RW management facilities is established in «Provisions for Licensing of Activities in the Field of Use of Atomic Energy» (the Government of the Russian Federational Decree № 865 of 14.07.1997). A decision to issue a license to operate RW management facilities is made by Rostekhnadzor after a review of documents justifying the application submitted by the operating organization.

A composition of documents justifying nuclear and radiation safety of RW management facilities being commissioned after construction is defined by the Administrative Regulation for the Federal Environmental, Industrial and Nuclear Supervision Service's execution of the state function of licensing of activities in the field of the use of atomic energy (№ 262 of 16.10.2008). To obtain an operating license, the operating organization submits the following main documents:

- safety analysis report;
- quality assurance program during operation of RW management facilities;
- information on recruitment, training, maintaining skills and permits to work independently of the employees;
- accident elimination procedure;

- beyond design basis accident management guide;
- plan of personnel protection measures in case of an accident;
- nuclear safety procedure for storage, transportation and reloading of nuclear fuel;
- record of control and accounting of nuclear materials and (or) radioactive waste;
- record of physical protection arrangements;
- RW management facility commissioning program;
- operating instructions or basic technological systems.

Operation of RW management facilities is allowed only after all startup and alignment works have been completed and integrated system (component) run has been carried out and provided there is a Safety Analysis Report, as revised considering results of startup and alignment works and the integrated run of systems (components).

H.6.2. Setting and Updating Safe Operation Limits and Conditions

Basing on documentation written by designers of the equipment, processes and design, the operating organization before the integrated run of systems (components) should develop operating documentation of RW management facilities.

The operating documentation contains rules and main approaches to safe operation, general safety related operation procedures, safe operation limits and conditions, specific instructions to employees (personnel) on how to perform in normal operation and operational events, including pre-accident states, employees' (personnel's) actions to ensure safety in design basis and beyond design basis accidents.

The operating documentation is updated basing on the facility commissioning results.

Before introducing changes to the operating documentation, which affect safety of the facility, the updated safety documentation (reports, supplements etc.) is submitted to Rostechnadzor for review and decision-making on changing the license conditions.

H.6.3. Regulation of Maintenance and Repairs, Inspection and Testing of RW Management Facilities

The operating organization should carry out planned preventive and (or) capital repairs of equipment of RW management facilities as per their schedules.

Basing on the existing regulatory and institutional documents, the enterprise administration drafts a specific maintenance and repair program for which implementation the maintenance and repair schedules are generated and approved. The work is carried out in accordance with procedures for maintenance and repairs of safety important systems and as per a schedule approved by the enterprise administration.

In order to sustain working capacity of safety important systems, they are maintained, repaired, tested and checked. This work is carried out in accordance with the corresponding operating documentation, programs and schedules generated in accordance with the procedure established by the operating organization basing on design requirements.

After the maintenance and repairs the system components and systems themselves are subjected to performance tests and checks for compliance with design characteristics, check results being documented.

Normally, safety important systems (components) are subjected to a direct and comprehensive check as to their compliance to design indicators at the commissioning, after repair and periodically throughout the entire service life of RW management facilities.

A necessity of unscheduled maintenance and repair of equipment and systems is determined by results of monitoring of their conditions.

Checks and tests of safety important systems are carried out in accordance with technical regulations.

According to requirements of federal norms and rules, a performance check of safety important systems should be carried out before commissioning of a RW management facility, after a capital repair, refurbishment and (or) modernization, as well as periodically as per requirements of the design, regulations and operating documentation. Frequency and scope of periodic checks should be set forth in schedules.

To carry out works related to operation of a RW management facility, in particular, maintenance and repair, the operating organization should ensure that these works are executed by the personnel having appropriate qualifications and that organizations involved in execution of these works and rendering services have appropriate licenses.

During operation oversight and monitoring by a state safety regulatory authority, as well as departmental oversight and inspections are carried out.

H.6.4. Engineering, Technical and Scientific Support of Operation

The operating organization over the entire life of a RW management facility should provide for a necessary scientific and engineering support on its own and with involvement of outsourced contractors.

The operating organization should carry out planned preventive and (or) capital repairs of equipment of RW management facilities as per their schedules. In order to sustain working capacity of safety important systems and to prevent dangerous failures, they are maintained, repaired, tested and checked.

At different stages of a RW management facility construction, commissioning and operation, types and ways of technical and engineering support vary depending on tasks the operating organization and specific facility are facing.

As a rule, the operating organization, as well as administration of enterprises, involves specialist research, development, repair, adjustment and other organizations, and RW management facility equipment producers in performance of necessary works and rendering necessary services, provided they have appropriate licenses for rendering these services.

H.6.5. Accounting of RW Management Facility Safety Significant Operational Events

According to requirements of the Federal Law «On the Use of Atomic Energy», the operating organization continuously controls over safe operation of a RW management facility at all its life stages.

At present, the analysis and accounting of nuclear facilities and SF operational events, including safety significant ones, is regulated by:

- Provisions regarding investigation and accounting procedures of operational violations (NP-004-97 and other),
- General Safety Provisions (NP-016-05 and other),
- departmental documents of the operating organization which regulate procedures for RW management facility operational event investigation and accounting.

The facility operational events, including accidents, are duly investigated. The operating organization should develop and implement measures aimed at prevention of event recurrence. The operating organization should provide for operational event information to the state body for control over the safety use of atomic energy.

The control and inspection system being implemented by the operating organization is aimed at an early detecting and preventing deficiencies in the facility performance and their timely elimination.

H.6.6. RW Management Facility Operating Experience Information Collection and Analysis

During operation of RW management facility, the operating organization should duly collect, process, analyze, systematize and store information on RW management facility operating experience, failures of safety important system components and erroneous actions of employees (personnel), violations of safe operation limits and conditions and ensure prompt transfer of such information to the organizations which have necessary authorities for subsequent analysis.

The operating organization should ensure storage of the design documentation of a RW management facility, executive documentation for construction of nuclear facilities and SF, tests records and executive documentation for maintenance and repair of safety systems (components) and safety important components throughout the service life of the facility.

In case of RW disposal, the operating organization should document and store information required for RWDF (LRW DDF) closure, including design and operating documentation, as well as information on changes introduced to the process systems, carried out refurbishments, levels of contamination with radioactive substances of surfaces before works to close the facility, as well as of RWDF sites, on quantity and radionuclide composition of waste accumulated during operation and stored on the RWDF (LRW DDF) site, its characteristics and storage locations, quantities of disposed RW, its radionuclide composition and specific activity, storage capacity and free volumes of RW storage facilities for RW placement, accidents at RWDF (LRW DDF) led to a radioactive contamination of systems, components, rooms and building structures.

H.6.7. Decommissioning Program

The Federal Law «On the Use of Atomic Energy», legal regulatory acts, federal norms and rules in the field of the use of atomic energy establish requirements for RW management facility decommissioning (closure).

According to «Provisions for Licensing of Activities in the Field of the Use of Atomic Energy» Article 18, in the process of granting a license for siting, construction and operation of nuclear facilities or SF and review of the document package justifying nuclear and radiation safety if nuclear facilities or SF and (or) declared activity, Rostechнадзор compulsory analyzes an ability of the applicant to ensure safe termination of the declared activity and decommissioning of the nuclear facility, as well as availability of related plans, programs and design materials.

Organizational and engineering measures in the course of design, construction and operation of a RW management facility, including disposal, should be carried out with an account taken of its future decommissioning (closure).

Decommissioning of a RW management facility (closure of RW disposal facility) should be carried out in accordance with a decommissioning (closure) program and decommissioning (closure) project.

Decommissioning (closure) of a RW management facility should be preceded by an integrated engineering and radiation survey. Basing on the survey results, the operating organization provides for development of a RW management facility decommissioning project and writes a decommissioning (closure) safety analysis report.

The decommissioning program and project should be developed considering modernizations that have been carried out and consequences of incidents that have occurred.

H.7. Institutional Measures after Closure (Article 17)

Article 17. Institutional Measures after Closure

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

- (i) records of the location, design and inventory of that facility required by the regulatory body are preserved;*
- (ii) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and*
- (iii) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.*

The federal norms and rules provide for the corresponding procedure of closing RW storage facilities and procedure of controls after its closure.

Requirements for institutional controls after closure of a RW storage facility are regulated by federal norms and rules NP-058-04 «Safety of Radioactive Waste Management. General Provisions» and NP-055-04 «Disposal of Radioactive Waste. Safety Principles, Criteria and Main Safety Requirements.»

After closure of a RWDF (LRW DDF), monitoring of the RW disposal system, including monitoring of conditions of engineering and natural barriers, environmental monitoring, should be carried out during a period of time justified in the RWDF (LRW DDF) closure project. Duration of the monitoring of the RW disposal system is set and justified in the RWDF (LRW DDF) closure project depending on a total activity of disposed RW and its radionuclide composition.

To verify safety of RW DDF a monitoring of LRW DDF should be carried out to determine an outline of LRW propagation in the geologic environment and its changes, timely obtaining of information on position of LRW and its components in the geologic environment and ongoing processes related to disposal, assessment of technical conditions of main structures of LRW DDF, identification of signs of failures and emergencies development at an early stage, documenting and storing reference observation data and their processing results in the format of periodically supplemented databases.

A LRW DDF monitoring system should include a mathematical model which describes LRW DDF processes which is periodically supplemented by reference observation data, and software.

The operating organization ensures safety of the closed RWDF (LRW DDF), storage of documentation on the closed RWDF (LRW DDF) during a period of time established in the RWDF

(LRW DDF) closure project, as well as maintains engineering barriers in conditions determined in the project in accordance with requirements of federal norms and rules.

In case the monitoring of the RW disposal system reveals departures from the end state of RWDF (LRW DDF) determined in the RWDF (LRW DDF) closure project that lead to degradation of its safety level, all practicable measures aimed at ensuring safety of the closed RWDF (LRW DDF), including measures to reduce migration of radionuclides, decontamination of soil, clean-up of surface and groundwater, removal of water from disposal cells and other necessary measures should be implemented.

Monitoring of conditions of the closed RWDF (LRW DDF) should be carried out in accordance with a program developed and implemented by the operating organization. The program should define a procedure, conditions and planned term of the following measures:

- safety monitoring of the closed RWDF (LRW DDF);
- monitoring of the RW disposal system including monitoring of conditions of engineering and natural barriers;
- environmental monitoring;
- protection of engineering barriers from damages associated with penetration of animals and vegetation roots;
- dismantling and elimination of systems and equipment intended for monitoring of the RW disposal system;
- prevention of inadvertent human interference.
- The program should define:
 - a procedure for storing documentation on the closed RWDF (LRW DDF);
 - a description of the end state of the RWDF (LRW DDF) after the RW disposal system monitoring has finished.

Раздел I. Transboundary Movement (Article 27)

Article 27. Transboundary Movement

27-1 Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments.

In so doing:

- (i) a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;*
- (ii) transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;*
- (iii) a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;*
- (iv) a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;*
- (v) a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.*

27-2 A Contracting Party shall not license the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.

27-3 Nothing in this Convention prejudices or affects:

- (i) the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;*
- (ii) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;*
- (iii) the right of a Contracting Party to export its spent fuel for reprocessing;*
- (iv) rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.*

In the Russian Federation, the transportation of nuclear material and radioactive substances, including importation of SNF, is regulated by the following documents:

- The Basel Convention on the Control of the Transboundary Movement of Dangerous Wastes and Their Disposal;
- The Vienna Convention on the Civil Liability for Nuclear Damage;
- The Federal Law «On the Use of Atomic Energy»;
- The Federal Law «On the Environmental Protection»;
- The Federal Law «On the Radioactive Waste Management and on Introducing Changes to Separate Legal Acts of the Russian Federation»
- The Federal Law «On the Sanitary and Epidemiological Well-being of the Public»;
- On the Procedure of Importation of Irradiated Fuel Assemblies of Nuclear Reactors to the Russian Federation (Decree of the Government of the Russian Federation No 418 of 11.07.2003);
- The Federal Law «On Special Environmental Programs for Rehabilitation of Contaminated Sections of Territories» (№ 92-FL of 10.07.2001);
- On the State Competent Authority for Nuclear and Radiation Safety at Shipments of Nuclear Material, Radioactive Substances and Products Made Thereof (Decree of the Gov-

ernment of the Russian Federation No 204 of 19.03.2001 as in rev. № 751 of 15.09.2009; rev. 78 of 15.02.2011).

According to the Federal Law «On the Use of Atomic Energy» Article 63, the exporting and importing of nuclear materials, including nuclear fuel, radioactive substances, as well as radiation sources, should be carried out in accordance with the international obligations of the Russian Federation on the nonproliferation of nuclear weapons and the international agreements of the Russian Federation in the sphere of the use of atomic energy.

The importing of SNF from foreign states to the Russian Federation territory for temporary technological storage and (or) reprocessing is carried out in accordance with the procedure established by the Russian Federation legislation and international agreements of the Russian Federation.

The importation of foreign-made irradiated fuel assemblies to the Russian Federation is carried out basing of the positive statement produced by a special commission called for by the President of the Russian Federation.

The importation of irradiated fuel assemblies of nuclear reactors from foreign states to the Russian Federation for temporary technological storage and (or) their reprocessing is permitted only provided the state environmental review and other state reviews of the related project have been conducted, as provided by the legislation of the Russian Federation, a general reduction of risk of radiation impact and increase of environmental safety as a result of implementation of the corresponding project has been justified.

According to the Federal Law «On the Environmental Protection» (Articles 48 and 51), the importation of RW to the Russian Federation from foreign states on the basis of agreements for storage, including those for the purposes of disposal and neutralization, is prohibited.

According to the Federal Law «On the Radioactive Waste Management and on Introducing Changes to Separate Legal Acts of the Russian Federation» Article 31, the importation of radioactive waste to the Russian Federation for storage, reprocessing and disposal is prohibited except for cases envisaged by this article.

The procedure of importation to the Russian Federation of irradiated fuel assemblies of nuclear reactors, as well as return of these irradiated fuel assemblies or their reprocessing products (including RW) to the supplying state is defined in the Government of the Russian Federation Decree № 418 of 11.07.2003 «On the Procedure of Importation of Irradiated Fuel Assemblies of Nuclear Reactors to the Russian Federation».

According to the Decree, the importation to the Russian Federation of irradiated fuel assemblies was carried out provided there was the positive statement by the state environmental review on the unified project developed by authorized organizations and coordinated with the Ministry of the Russian Federation for Atomic Energy (now, Rosatom) and the Federal Environmental, Industrial and Nuclear Supervision Service, as well as provided the authorized organizations had relevant licenses granted by the Federal Environmental, Industrial and Nuclear Supervision Service.

The importation of SNF to the enterprises of the Russian Federation is performed in compliance with the international legal norms and Russian legislative basis, in particular:

- Agreement between the Government of the Russian Federation and the Government of Ukraine on Scientific, Technical and Economic Cooperation in the Area of Atomic Energy of 14.01.1993;

- Agreement between the Government of the Russian Federation and the Government of Republic of Bulgaria on Cooperation in the Area of Nuclear Power of 19.05.1995;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Uzbekistan on Scientific and Technical cooperation in the Area of Peaceful Use of Atomic Energy of 22.12.1997;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Kazakhstan on Scientific and Technical Cooperation in the Area of Peaceful Use of Atomic Energy of 23.09.1993;
- Agreement between the Government of the Russian Federation and the Government of the Czech Republic on Scientific and Technical Cooperation in the Field of Nuclear Power of December 4, 1994 and the Supplement to the Agreement between the Government of the Russian Federation and the Government of the Czech Republic on Scientific and technical Cooperation in the Field of Nuclear Power of 15.04.1999;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Latvia on Cooperating in Importation of SNF of the Research Reactor to the Russian Federation of 03.01.2007;
- Agreement between the Government of the Russian Federation and the Government of the Socialist Republic of Vietnam Concerning Cooperation in Building a Nuclear Power Plant in the Territory of the Socialist Republic of Vietnam of 31.10.2010.
- Agreement between the Government of the Russian Federation and the Government of the Republic of Belarus on Cooperation in the Area of Peaceful Use of Atomic Energy of 28.05.2009;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Belarus on Cooperation in the Importation to the Russian Federation of Irradiated and Fresh Highly Enriched Fuel of Research Reactors and in Supply to the Republic of Belarus of Fresh Low Enriched Nuclear Fuel of 08.10.2010;
- Agreement between the Government of the Russian Federation and the Great Socialist People's Libyan Arab Jamahiriya Concerning Cooperation in the Area of Peaceful Use of Atomic Energy of 01.11.2008;
- Agreement between the Government of the Russian Federation and the Great Socialist People's Libyan Arab Jamahiriya Concerning Cooperation in the Importation to the Russian Federation of Irradiated Nuclear Fuel of the Research Reactor of 21.10.2009;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Poland Concerning Cooperation in the Importation to the Russian Federation of Irradiated Nuclear Fuel of the Research Reactor of 01.09.2009;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Serbia Concerning Cooperation in the Importation to the Russian Federation of Irradiated Nuclear Fuel of the Research Reactor of 10.06.2009;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Romania Concerning Cooperation in the Importation to the Russian Federation of Irradiated Nuclear Fuel of the Research Reactor of 19.02.2009;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Hungary Concerning Cooperation in the Importation to the Russian Federation of Irradiated Nuclear Fuel of the Research Reactor of 22.07.2008;
- Agreement between the Government of the Russian Federation and the Government of the Republic of Bulgaria Concerning Cooperation in the Importation to the Russian Federation of Irradiated Nuclear Fuel of the Research Reactor of 18.01.2008.

Transportation of irradiated fuel assemblies and their reprocessing products within the territory of the Russian Federation is carried out in accordance with the federal norms and rules in the field of the use of atomic energy, special rules for transportation, rules of shipment of dangerous goods, as well as taking account of the existing international guidelines for safe transportation of radioactive materials, including:

- Safety Rules of Transportation of Radioactive Material (NP-053-04);
Regulation NP-053-04 was developed taking account of recommendations of the IAEA presented in Safety Series documents TS-R-1 (ST-1, Rev.). Regulations for the Safe Transport of Radioactive Material(2000).
- Basic Rules of Control and Accounting of Radioactive Substances and Radioactive Waste in an Organization (NP-067-05);
- Rules of Physical Protection of Radioactive Substances and Radioactive Sources during their Transportation (NP-073-06);
- Basic Sanitary Rules of Radiation Safety (OSPORB-99);
- Radiation Safety Standards (NRB-99) and other.

An annual amount of SNF to be imported to the territory of the Russian Federation is established by the Government of the Russian Federation.

One of the obligatory preconditions of importing SNF from foreign countries to the Russian Federation for interim technological storage and (or) reprocessing is the availability of the positive statement of the state environmental review issued on the relevant unified project.

Unified project is the documents prepared in relation to the expected signing of a foreign trade contract for performing the operations with irradiated fuel assemblies, the documents being subject to state ecological review. The documents should be developed and coordinated in compliance with the established requirements, including the following documents:

- a draft foreign trade contract;
- a SEP the implementation of which is performed at the cost of the funds resulting from the foreign trade operations with irradiated fuel assemblies;
- documents justifying a total reduction of risk of radiation impact and enhancement of environmental safety level as a result of implementation of the unified project, as well as the documents justifying the time constraints of the interim technological storage of the irradiated fuel assemblies and the products of reprocessing thereof, envisaged by the foreign trade contract.

A carrier of nuclear material and radioactive substances should have a permit (license) granted by the corresponding state safety regulatory authority to perform works in the field of use of atomic energy.

A foreign trade contract for the importation of foreign-made irradiated fuel assemblies should provide for subsequent return of radioactive waste to the supplying state unless otherwise is stated in the international agreements of the Russian Federation.

The return of reprocessing products is carried out under the following conditions:

- the return of reprocessing products should be carried out with meeting of the obligations of the Russian Federation on nonproliferation of nuclear weapons;
- an international agreement of the Russian Federation should include provisions which provide for obligations and guarantees of the supplying state to receive reprocessing products, as well as to provide an opportunity to verify that the necessary conditions for the receipt and safe operation thereof are in place;

- a foreign trade contract should include types, composition, physical form, quantity, type of package of the reprocessing products subject to the return.

A quantity of reprocessing products subject to the return to the supplying state is determined using methodologies agreed upon by the parties proceeding from the condition of activity equivalency of the irradiated fuel assemblies earlier imported for reprocessing and the reprocessing products being returned with the account taken of natural decay of radionuclides in the course of operations of the interim technological storage of the irradiated fuel assemblies and reprocessing products, as well as in the course of reprocessing of the irradiated assemblies.

The state oversight over nuclear, radiation and fire safety, as well as the state environmental safety control at all stages of management of irradiated fuel assemblies and their reprocessing products is carried out by Rostekhnadzor, bodies for sanitary and epidemiological supervision, the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Natural Disaster Consequences and the Federal Supervisory Natural Resources Management Service.

In compliance with the contracts in effect, spent fuel is imported from Ukraine and Bulgaria.

On 27.05.2004, in Moscow the Agreement between the Government of the Russian Federation and the Government of the United States of America on cooperation in importing into the Russian Federation of nuclear fuel of research reactors of Russian (soviet) origin, was signed.

According to the Agreement nuclear fuel of Russian origin, potentially suitable for nuclear weapons manufacturing, should be repatriated to Russia.

By present, RR SNF has been repatriated from Uzbekistan (2005-2006), Czech Republic (2007), Latvia (2008), Bulgaria (2008-2009), Hungary (2008), Kazakhstan (2009), Romania (2009), Libya (2009), Poland (2009-2010), Belarus (2010), Ukraine (2010), and Serbia (2010).

In coming years it is planned to repatriate RR SNF from Vietnam, Germany.

Transportation of SNF within the territory of Russia is carried out by rail and by road.

Transportation of packages with spent fuel from Ukrainian nuclear power plants is performed by rail by through train.

Transportation of packages with SNF from Kozloduy NPP (Bulgaria) is performed by water transport and by rail as this NPP is located on the Danube River and has no local railways.

To transport packages from Kozloduy NPP along the Danube the non-self-propelled barge «Nautilus» is used, and the reloading of the packages to the railcars is performed in the river port of Izmail (Ukraine).

In doing this:

- certified packagings are used, and the justification of the design of the packages to the requirements of the rules for safe shipment of radioactive substances is performed both by computational and experimental methods using the mock-ups of the packagings and their components. The results of these justifications of the design of the packages and safety of shipment thereof are given in different calculations, explanatory notes, reports and statements;
- special railcars and special vessels for transportation of packages are used;
- the transportation is organized by special trains under special shipment conditions;

- continuous control of shipments is performed.

All shipments are performed in full compliance with the international legal norms as well as the legal and regulatory frameworks of Russia, Bulgaria, Ukraine, Uzbekistan, Czech Republic, Latvia, Hungary, Kazakhstan, Romania, Libya, Poland, Belarus, Serbia and only in case the transportation permits granted by the relevant competent authorities of these states are available.

Transportation of NPP SNF of WWER-1000 reactors to MCC is performed in transportation packages TUK-13/1V, TUK-10V and TUK-13V according to the existing Rostekhnadzor's license for handling of nuclear material in transport № GN-05-401-2337 of 01.04.2010 basing on the presently valid:

- certificate-permit the design and transportation of transportation package TUK-13/1V RU/052/B(U)F-96T (Rev.6);
- certificate-permit for the design and transportation of transportation package TUK-10/V RU/050/B(M)F-96T (Rev.6);
- certificate-permit for the design and transportation of transportation package TUK-13V RUS/046/B(U)F-96T (Rev.7).

Transportation of NPP SNF of WWER-440 reactors to PA Mayak is performed in transportation packages TUK-6 on the basis of the presently effective certificate-permission RU/042/B(M)F-96T(Rev. 6) in accordance with the procedure determined by Rostekhnadzor license for the management of nuclear material in transport № GN-05-401-2381 of 01.06.2010.

The Federal Law № 139-FL of 04.11.2005 «On the Ratification of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management» guarantees, in particular, the fulfillment of the provision of the Convention Article 27-2 that the Russian Federation does not license shipments of its SNF or RW to a destination south of latitude 60 degrees South for storage or disposal.

Section J. Disused Sealed Sources (Article 28)

Article 28. Disused Sealed Sources

28-1 Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner.

28-2 A Contracting Party shall allow for reentry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.

In compliance with the current legislation of the Russian Federation, the disused sealed radionuclide sources (SRS) are categorized as RW, if their assigned service life has expired or they are acknowledged as defective.

The RW, including disused SRS, importation to Russia is prohibited by the Russian Federation Law «On the environmental protection».

According to data of the state system for control and accounting of RS and RW, on average 40,000 SRSs with an expired assigned operation life are written off every year in the Russian Federation.

The PA Mayak, the main producer of category 1 or 2 SRS, accepts the SRS of its own production, written off during a year, from the users in the Russian Federation.

Other disused SRS are transferred in accordance with the established order to RosRAO for long-term storage.

The legal basis for regulating the management of SRS, including unused ones, are the federal laws in the area of the use of atomic energy and protection of the environment, the Decree of the Government of the Russian Federation № 1298 of 11.10.1997 «On the Approval of the Rules for Organizing the System for State Accounting and Control of Radioactive Substances and Radioactive Waste in the Russian Federation» (with changes of 4 February 2011), «Provisions on the State Accounting and Control of Radioactive Substances and Radioactive Waste in the Russian Federation» (as approved by Minatom of Russia on 11 October 1999), and federal norms and rules in the field of the use of atomic energy issued by regulatory authorities, which establish requirements for control and accounting of radioactive substances and RW in the organization and their disposal.

In accordance with the Federal Law «On the Radioactive Waste Management and on the Changes in Some Legislative Acts of Russian Federation» № 190-FL of 11.07.2011 the return of spent SRS produced in the Russian Federation is allowed, including the purpose of their reprocessing or disposal.

In accordance with the Federal Law «On the Use of Atomic Energy», the owners of RS and radioactive substances should control their security and proper use.

The operating organization should provide for control and accounting of RS and RW.

Rules of control and accounting of RS and RW, including disused SRS are established by NP-067-05.

The SRS, which assigned service life has expired, are subject to writing off as radioactive substances re-categorized to RW, with relevant entries made to the Radioactive Substances Receipt-Release Log and the RW Accounting Log and formalizing a relevant record, or their

service life is extended with a related entry made to the Radioactive Substances Receipt-Release Log.

In case the receiving organization reveals through a cross-check of the supplying organization data a loss or theft or unauthorized use, or a lack (excess) of SRS, it should inform on that the relevant controlling bodies within the state system for control and accounting of radioactive substances and RW (a federal-level body for controlling the State system for control and accounting, a regional-level body for controlling the state system for control and accounting, an institutional-level body for controlling the State system for control and accounting), the State safety regulatory body in the field of the use of atomic energy which supervises over the state system for control and accounting of RS and RW within 24 hours upon revealing the above facts.

An organization should effect and maintain a system of measures aimed at ensuring the keeping of SRS and unsealed radiation sources (URS) records during 10 years after SRS and URS were put under the category of RW or transferred to other organizations.

In the Russian Federation Rostekhnadzor controls safety of IRS management.

Rostekhnadzor licenses activities associated with SRS management, controls compliance with licensing requirements and requirements of legal regulatory acts.

At the present time, the organizations are subject to informative procedure as regards transfers of sources. With that, both the supplier of the source (after the off-shipment) and recipient (after the receipt) should provide the related information.

Transportation and storage (disposal) of disused SRS is performed by specialized organizations, which have licenses issued by Rostekhnadzor for such activity while the requirements of the federal norms and rules in the field of the use of atomic energy observed.

Active work on disposal of high-level SRS, including RTGs, is performed in frames of both the national program and the international cooperation, including that with the IAEA.

Section K. Planned Activity in Safety Enhancement

For the purposes of implementing «Fundamentals of the State Policy in the Area of Ensuring Nuclear and Radiation Safety of the Russian Federation for the Period of Up to 2010 and Beyond», the FTP «Nuclear and Radiation Safety» was approved (Decree of the Government of the Russian Federation № 444 of 13 July 2007).

The main program objective is to comprehensively solve nuclear and radiation safety problems in the Russian Federation associated with SNF and RW management, decommissioning of nuclear and radiation hazardous facilities, improvement of systems which are necessary for ensuring and controlling nuclear and radiation safety.

According to decision of the Government of the Russian Federation № 1950-r of 11.10.2011, to continue solving accumulated problems in the field of SNF, RW management and decommissioning of nuclear and radiation hazardous facilities, and improvement of systems of monitoring, emergency response and medical and sanitary support required for nuclear and radiation safety ensuring, it has been planned to develop a national program «Development of the Nuclear Power and Industry Complex in 2011-2015 and until 2020».

In the Russian Federation it is planned to develop a legal basis in the field of safety regulation at SNF and RE management. It is envisaged to draft and adopt regulations provided by the Federal Law «On the Radioactive Waste Management and on the Changes in Some Legislative Acts of Russian Federation».

The issues related to the planned activities to enhance safety are described in more detail in the corresponding sections on SNF and RW management safety.

Section L. Appendices

Appendix B1. SNF Management and Reprocessing SNF of Russian reactors

Table B1.1. SNF locations

Location		Facility type
NPP		
Kola NPP	WWER-440	Storage
Novovoronezh NPP	WWER-440	
	WWER-1000	
Balakovo NPP	WWER-1000	
Volgodonsk NPP	WWER-1000	
Kalinin NPP	WWER-1000	
Kursk NPP	RBMK-1000	
Leningrad NPP	RBMK-1000	
Smolensk NPP	RBMK-1000	
Beloyarsk NPP	BN-600	
	AMB	
Bilibino NPP	EGP-6	
NFC		
PA Mayak	WWER-440, AMB	Reprocessing Facility Storage
MCC	WWER-1000	Storage
RR		
National Research Center «Kurchatov Institute»	MR	Storage
	IR-8	
Institute of Physics and Power Engineering (IPPE)	AM-1	
	BR-10	
FSUE IRM	IVV-2	
RIAR	MIR.M1	
	SM-3	
	RBT-10/2	
	BOR-60	
	VK-50	
	KORO	
PNPI RAS	VVR-m	
Branch FSUE Karpov IPC	VVR-ts	
MEPhI	IRT	
SSU TPU SRI NF	IRT-T	
NPI		
MSC, FMB Lotta		Storage
Container storage of icebreaker SNF		

Table B1.2. Quantities of SNF of different types of reactors at the enterprises, as of 01.01.11

Operating organization and its branches	Fuel type	SNF quantity, metric tons
Kola NPP	WWER-440	96.9
Novovoronezh NPP	WWER-440	76.2
	WWER-1000	200.9
Balakovo NPP	WWER-1000	420.8
Rostov NPP	WWER-1000	101.2
Kalinin NPP	WWER-1000	253.0
Kursk NPP	RBMK-1000	5,023.9
Leningrad NPP	RBMK-1000	4,906.6
Smolensk NPP	RBMK-1000	2,662.0
Beloyarsk NPP	BN-600	29.1
	AMB	190.9
Bilibino NPP	EGP-6	150.4
PA Mayak	WWER-440, AMB	319.8
MCC	WWER-1000	6,029.7
IPPE	AM-1	12
Atomflot, FMB Lepse		2.52*
Atomflot, FMB Lotta		3.58*
Atomflot, FMB Imandra		1.01*
Atomflot, SNF container SF of nuclear icebreakers		1.34*

* recalculated to uranium metal

Appendix B2. RW generation

Table B2.1. LRW generation in 2010

Total LRW	Volume	Activity
	3.04 mln m³ — 100%	1.8·10¹⁸ Bq — 100%
LLW	92.69%	0.009%
ILW	6.84%	4.81 %
HLW	0.47%	95.18 %

Table B2.2. SRW generation in 2010

Total SRW	Mass	Activity
	1.39 mln t (100%)	9.65·10¹⁸ Bq (100%)*
LLW	99.22%	0.003%
ILW	0.45%	1.09%
HLW	0.33%	98.91%

* considering activity of graphite stack of 2 decommissioned production reactors at MCC re-categorized as RW.

Annex E. Information of the Principal Legal Documents

In the Annex E is given the list of the main normative legal Acts (international agreements, Federal Laws, decrees and orders of the President of Russian Federation, ordinances of the Government of Russian Federation) which regulate the activities of the RW and SNF management, as well as the list of the main normative documents.

1. Principal International Agreements of Russian Federation

№	Title of the document	Year
1.	International Convention for the Safety of Life at Sea	1965
2.	Convention on Early Notification of a Nuclear Accident	1986
3.	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	1986
4.	Convention on the Physical Protection of Nuclear Material	1987
5.	Convention on Environmental Impact Assessment in a Transboundary Context	1991
6.	Convention on Nuclear Safety	1996
7.	Convention on Civil Liability for Nuclear Damage	1996
8.	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	1998

2. Federal Laws

№	Title of the document	Registration № and the date when the document was signed
1.	On the use of atomic energy	№170-FL of November 21, 1995
2.	On subsoil resources	№ 2395-1 of February 21, 1992
3.	On ratification of the Joint Convention on the safety of radioactive waste management	No139-FL of November 04, 2005
4.	On assuring uniformity of measurements	№ 4871-1 of April 27, 1993
5.	On the protection of the population and territories against emergencies of natural and man-induced origin	№68-FL of December 21, 1994
6.	On fire safety	№69-FL of December 21, 1994
7.	Water code of Russian Federation	№74-FL of June 19, 2007
8.	On ecological expert examination	№174-FL of November 23, 1995
9.	On the radiation safety of population	№93-FL of January 09, 1996
10.	On financing of particularly radiation hazardous and nuclear hazardous production facilities and objects	№29-FL of April 03, 1996
11.	On industrial safety of hazardous production objects	№116-FL of July 21, 1997
12.	On safety of hydraulic facilities	№117- FL

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№	Title of the document	Registration № and the date when the document was signed
		of July 21, 1997
13.	On counteracting terrorism	№35-FL of March 06, 2006
14.	On sanitary and epidemiological well-being of the population	№52-FL of March 30, 1999
15.	On departmental guards	№77- FL of April 14, 1999
16.	On special ecological programs for remediation of radioactively contaminated territories	№92- FL of July 10, 2001
17.	Code of Russian Federation on administrative violations	No 195-FL of December 30, 2001
18.	On the environmental protection	No 7-FL of January 10, 2002
19.	On the technical regulation	No 184-FL of December 27, 2002
20.	On the licensing of some activities	No 128-FL of August 08, 2001
21.	On the changes and supplements to the Criminal code of Russian Federation, Procedural criminal code of Russian Federation and Code of Russian Federation on administrative violations	No 133-FL of October 31, 2002
22.	Urban development code of Russian Federation	No 190-FL of December 29, 2004
23.	On the State corporation for nuclear energy «Rosatom»	No 317-FL of December 01, 2007
24.	On the features of the management and disposition of property and stock of the organizations which carry out activities in the field of use of atomic energy, and on the changes of some legislative Acts of Russian Federation	No 13-FL of February 05, 2007
25.	Technical regulations on fire safety requirements	No 123-FL of July 22, 2008
26.	On the protection of the rights of legal entities and sole proprietors by the implementation of the State control (supervision) and municipal control	No 294-FL of December 26, 2008
27.	On the order of implementation of foreign investments in the economic entities, having strategic importance for the defense of the country and State security	No 57-FL of April 29, 2008
28.	Technical regulations on the safety of buildings and constructions	No 384-FL of December 30, 2009
29.	On the amendment to the Convention on the physical protection of nuclear material	No 130-FL of July 22, 2008
30.	Statute on the discipline of the workers of organizations, operating particularly hazardous radiation and nuclear production facilities and objects in the field of use of atomic energy	No 35-FL of March 08, 2011
31.	On the management of radioactive wastes and on the changes in some legislative Acts of Russian Federation	No 190-FL of July 11, 2011
32.	On the changes of some legislative Acts of Russian Federation regarding issues of implementation of State control (supervision) and municipal control	No 242-FL of July 18, 2011

3. Decrees and Orders of the President of Russian Federation

№	Title of a decree or an order	Registration number and the date
1.	On the control over export of nuclear materials, equipment and technologies from Russian Federation	№312, of March 27, 1992
2.	On the operating organization of nuclear power plants of Russian Federation	№1055, of September 07, 1992
3.	On the implementation by Russian Federation of intergovernmental agreements on cooperation in construction of nuclear power plants abroad	№472, of April 21, 1993
4.	On the State support of the restructuring and conversion of nuclear industry in the town Zheleznogorsk of Krasnoyarsk Kraj	№72, of January 25, 1995
5.	On the complementary measures to enhance the control over the fulfillment of the requirements of ecological safety by the spent nuclear fuel reprocessing	№ 389, of April 20, 1995
6.	On the improvement of the administration of the enterprises of nuclear fuel cycle	№166, of February 08, 1996
7.	On the approval of the List of nuclear materials, equipment, special non-nuclear materials and relevant technologies, subject to the export control	№202, of February 14, 1996
8.	Competences of the Ministry of civil defense, emergencies and elimination of the consequences of natural disasters of Russian Federation	№953, of August 02, 1999
9.	On the improvement of State administration in the field of fire safety	№1309, of November 09, 2001
10.	On special commission on the issues of import of foreign manufacturers' irradiated fuel assemblies to the territory of Russian Federation	№ 828, of July 10, 2001
11.	On the approval of the Statute of the special commission on the issues of import of foreign manufacturers' irradiated fuel assemblies to the territory of the Russian Federation and the composition of this commission	№ 858, of July 31, 2003
12.	On the restructuring of the nuclear power and industry complex of Russian Federation	No 556 of April 27, 2007
13.	On measures to create the State corporation for nuclear energy «Rosatom»	No 369 of March 20, 2008
14.	Issues of the system and structure of the Federal executive authorities	No 724 of May 12, 2008
15.	On the changes of some Acts of the President of Russian Federation according to the creation of the State corporation for nuclear energy «Rosatom»	No 460 of April 08, 2008
16.	Issues of the Federal environmental, industrial and nuclear supervision service	No 780 of June 23, 2010
17.	On the optimization of the number of Federal State civil employees and workers of Federal State authorities	No 1657 of December 31, 2010

4. Ordinances and Regulations of the Government of Russian Federation

№	Title of an ordinance	Registration number, date
1.	On the approval of the procedure for the inventory of the places and objects for the mining, transportation, reprocessing, use, collection, storage and disposal of radioactive substances and ionizing radiation sources in the territory of Russian Federation	№ 505, of July 22, 1992
2.	On the measures for comprehensive solving of the problems of management of radioactive wastes and cessation of their disposal in the seas	№ 710, of July 23, 1993
3.	On the approval of the Statute of State ecological expert examination	№ 942, of September 22, 1993
4.	On the approval of the Provision on the procedure of State ecological expert examination	№ 698, of July 11, 1996
5.	On the procedure of the elaboration of radiation hygienic certificates («passports») of organizations and territories	№ 93, of January 28, 1997
6.	On the rules of decision-making on location and construction of nuclear facilities, radiation sources and storage facilities	№ 306, of March 14, 1997
7.	On the measures to fulfill the Decree of the President of Russian Federation № 166 from February 08, 1996 «On the improvement of the administration of the enterprises of nuclear fuel cycle»	No 367, of April 02, 1997
8.	On the approval of the Provision on the procedure of State ecological expert examination	No 865, of July 14, 1997
9.	On the procedure of the elaboration of radiation hygienic certificates («passports») of organizations and territories	№ 93, of August 13, 1997
10.	On the approval of the Provision for the elaboration and approval of Federal norms and rules in the field of use of atomic energy and of the list of Federal norms and rules valid in the field of use of atomic energy	№ 1511, of December 01, 1997
11.	On export and import of nuclear materials, equipment, special non-nuclear materials and relevant technologies	№ 973, of December 15, 2000
12.	On the procedure of the implementation of State expert examination and approval of urban planning, pre-design and design documentation	№ 1008, of December 27, 2000
13.	On the approval of the Provision on State sanitary and epidemiologic service of Russian Federation and the Provision on State of sanitary and epidemiologic normative standardization	№ 554, of July 24, 2000
14.	Provision on the State supervision in the field of protection of population and territories against the natural and man-induced accidents, executed by the Ministry for civil defense, emergencies and elimination of consequences of natural disasters of Russian Federation	№ 865, of July 14, 1997
15.	On State competent authority on nuclear and radiation safety by the transportation of nuclear materials, radioactive substances and articles made from them	№ 204, of March 19, 2001
16.	On the procedure of import of irradiated fuel assemblies of nuclear reactors to Russian Federation	No 418, of July 11, 2003
17.	On the approval of the Provision on financing of special ecological programs for remediation of radioactively contaminated parts of territories	№ 588, of September 22, 2003

№	Title of an ordinance	Registration number, date
18.	On the approval of the Provision on elaboration of special ecological programs for remediation of radioactively contaminated parts of territories	№ 421, of June 14, 2002
19.	On the Federal environmental, industrial and nuclear supervision service	№ 401, of July 30, 2004
20.	On the Federal medical and biological agency	No 206, of April 11, 2005
21.	On the Federal executive authorities exercising the State administration of the use of atomic energy and the State safety regulation by the use of atomic energy	No 412, of July 03, 2006
22.	On the Federal purpose-oriented program «Development of nuclear power and industry complex of Russia in 2007-2010 and up to 2015»	No 605 of October 06, 2006
23.	On engineering researches for preparation of design documentation, construction, and reconstruction of capital construction objects	No 20, of January 19, 2006
24.	On the State building inspection in Russian Federation	No 54, of February 01, 2006
25.	On the procedure and conditions of transfers of the right of ownership for nuclear material to a foreign state or foreign legal entity	No 724, of October 31, 2007
26.	On the Federal purpose-oriented program «Provision of nuclear and radiation safety in 2008 and up to 2015»	No 444, of July 13, 2007
27.	On the approval of the rules for the physical protection of nuclear materials, nuclear facilities and storage facilities for nuclear materials	No 456, of July 19, 2007
28.	On the structure of sections of design documentation and requirements to their contents	No 87, of February 16, 2008
29.	On approval of the Provision on the system for the State control and accounting of nuclear materials	No 352 of May 06, 2008
30.	On the approval of the regulations of the State corporation for nuclear energy «Rosatom»	No 888, of November 26, 2008
31.	On the list of organizations operating particularly radiation hazardous and nuclear hazardous production facilities and objects	No 1311-r, of September 14, 2009
32.	On the changes in some Ordinances of the Government of Russian Federation on the issues of some competences of the Ministry of natural resources and environment of Russian Federation, by the Federal service on supervision in sphere of wildlife management and by the Federal environmental, industrial and nuclear supervision service	No 717, of September 13, 2010
33.	On the changes in some Acts of the Government of Russian Federation	No 48, of February 04, 2011
34.	On the approval of the Provision on the acknowledgement of the organization as appropriate to operate the nuclear facility, radiation source or storage facility and to carry out both per se or with involvement of other organizations the activities for location, design, construction, operation and decommissioning of the nuclear facility, radiation source or storage facility, as well as the activities of management of nuclear materials and radioactive substances	No 88, of February 17, 2011

5. Federal Norms and Rules in the Field of Use of Atomic Energy

No	Title of the Document	Reference number
1.	Radiation safety norms	NRB-99/2009
2.	Main sanitary rules of radiation safety	OSPORB-99/2010
3.	Sanitary rules for management of radioactive wastes	SPORO-2002
4.	Sanitary rules of design and operation of nuclear power plants	SP AS-03
5.	Hygienic requirements for design of enterprises and facilities of nuclear industry	SPP PUAP-03
6.	Sanitary protection (control) zones and zones of surveillance of radiation objects. The conditions of operation and substantiation of the boundaries	SP SZZ and ZN-07
7.	Fire safety rules of Russian Federation	PPB 01-03
8.	Fire protection of enterprises. General requirements	NPB 201-96
9.	General safety provisions of nuclear power plants (OPB-88/97)	NP-001-97
10.	Safety rules by the management of radioactive wastes of nuclear power plants	NP-002-04
11.	Provision on the procedure of the investigation and accounting of the violations in the work of nuclear power plants	NP-004-08
12.	Requirements for the contents of the reports substantiating safety of NPPs with WWER reactors	NP-006-98
13.	Requirements for the quality assurance program for nuclear power plants	NP-011-99
14.	Rules providing safety by the decommissioning of a NPP unit	NP-012-99
15.	Facilities for reprocessing of spent nuclear fuel. Safety requirements	NP-013-99
16.	Rules of investigation and accounting of violations by the management of radiation sources and radioactive substances used in national economy	NP-014-2000
17.	Typical contents of the Plan of actions for personnel protection in the case of emergency on NPP	NP-015-2000
18.	General safety provisions for nuclear fuel cycle objects (GSP NFCO)	NP-016-05
19.	Main requirements for life extension of NPP unit	NP-017-2000
20.	Requirements for contents of report substantiating safety of NPPs with fast neutron reactors	NP-018-05
21.	Collection, reprocessing, storage and conditioning of liquid radioactive wastes. Safety requirements	NP-019-2000
22.	Collection, reprocessing, storage and conditioning of solid radioactive wastes. Safety requirements	NP-020-2000
23.	Management of gaseous radioactive wastes. Safety requirements	NP-021-2000
24.	General safety provisions for marine nuclear power units	NP-022-2000
25.	Requirements for report substantiating safety of marine nuclear power units	NP-023-2000
26.	Requirements for substantiation of possibility for life extension of the objects of use of atomic energy	NP-024-2000
27.	Provision on the procedure of the investigation and accounting of the violations in the work of research nuclear installations	NP-027-01
28.	Rules providing safety by the decommissioning of the research nuclear installations	NP-028-01
29.	Location of nuclear power plants. The main safety criteria and requirements	NP-032-01
30.	General safety provisions of research nuclear installations	NP-033-01
31.	Dry storage facilities for spent nuclear fuel. Safety requirements	NP-035-02
32.	Rules providing safety by the decommissioning of marine nuclear power units	NP-037-02
33.	General safety provisions of radiation sources	NP-038-11
34.	Requirements for contents of report substantiating safety of radiation sources	NP-039-02

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No	Title of the Document	Reference number
35.	Requirements for quality assurance program for the objects of nuclear fuel cycle	NP-041-02
36.	Requirements for quality assurance program for the research nuclear installations	NP-042-02
37.	Requirements for the safe arrangement and safe operation of the lifting cranes for the objects of use of atomic energy	NP-043-03
38.	Provision on the procedure of the investigation and accounting of the violations in the work of objects of nuclear fuel cycle	NP-047-11
39.	Requirements for contents of report substantiating safety of research nuclear installations	NP-049-03
40.	Location of the nuclear facilities of nuclear fuel cycle. The main safety criteria and requirements	NP-050-03
41.	Requirements for report substantiating safety of nuclear facilities of nuclear fuel cycle	NP-051-04
42.	Rules providing safety by the temporary storage of the radioactive wastes, formed by the mining, reprocessing and use of the minerals	NP-052-04
43.	Safety rules by the transportation of radioactive materials	NP-053-04
44.	Disposal of radioactive wastes. Principles, criteria and main requirements of safety	NP-055-04
45.	Requirements for quality assurance program of marine nuclear power units	NP-056-04
46.	Safety rules by the decommissioning of nuclear facilities of nuclear fuel cycle	NP-057-04
47.	Safety by the management of radioactive wastes. General provisions	NP-058-04
48.	Safety rules by the storage and transportation of nuclear fuel on the objects of use of atomic energy	NP-061-05
49.	Rules of nuclear safety for the objects of nuclear fuel cycle	NP-063-05
50.	Accounting of the external natural and man-induced impacts on the objects of use of atomic energy	NP-064-05
51.	Requirements for the report substantiating safety of the storage facilities for the nuclear materials	NP-066-05
52.	The main rules of the accounting and control of the radioactive substances and radioactive wastes in an organization	NP-067-05
53.	Near-surface disposal of radioactive wastes. Safety requirements	NP-069-06
54.	Rules of the safe arrangement and safe operation of equipment and pipelines of the objects of nuclear fuel cycle	NP-070-06
55.	Rules of assessment of conformity of equipment, components, materials and half-finished products supplied to the objects of use of atomic energy	NP-071-06
56.	Rules of the allocation of the nuclear materials to the category of the radioactive wastes	NP-072-06
57.	Requirements for planning and provision of the preparedness to eliminate the consequences of accidents by the transportation of nuclear materials and radioactive substances	NP-074-06
58.	Requirements to contents of a Plan of actions for personnel protection in the case of an accident at research nuclear installations	NP-075-06
59.	Installations for immobilization of transuranic radioactive wastes. Safety requirements	NP-076-06
60.	Requirements to contents of a Plan of actions for personnel protection in the case of an accident in the enterprise of the nuclear fuel cycle	NP-077-06
61.	Provision on the procedure to declare the emergency preparedness and emergency and of the procedure of the prompt informing in the case of radiation hazardous situations in the enterprises of nuclear fuel cycle	NP-078-06
62.	Requirements for planning of measures for actions and protection of workers (personnel) by the radiation accidents on the marine nuclear power unit of the ship and (or) other waterborne vehicle	NP-079-06

6. Safety Guides of Rostechnadzor

№	Title of the document	Reference number
1.	Requirements for quality assurance program by the management of radioactive wastes	RB-003-98
2.	Requirements for the report substantiating safety of the storage facilities for the radioactive wastes, taking into account the external impacts	PNAE G-14-038-96
3.	Determination of the initial seismic vibrations of soil for design basis	RB-006-98
4.	Safety assessment of near-surface storage facilities for radioactive wastes	RB-011-2000
5.	Structure and contents of the report on the status of radiation safety in the radiation hazardous objects	RB-012-04
6.	Provision of safety by the management of radioactive wastes, formed by the mining, processing and use of minerals	RB-014-2000
7.	Assessment of the seismic hazard of the territories envisaged for the location of the nuclear and radiation hazardous objects according to the geodynamic data	RB-019-01
8.	Recommendations for the establishment of the criteria for the acceptability of the conditioned radioactive wastes for their storage and disposal	RB-023-02
9.	Recommendations for recruitment, training, maintaining and enhancement of competence of operating personnel of objects of nuclear fuel cycle	RB-034-05
10.	Structure and contents of report substantiating safety of temporary storage facilities for radioactive wastes, formed by the mining, processing and use of minerals	RB-035-05
11.	Monitoring of engineering and geological conditions for the location of the objects of nuclear fuel cycle	RB-036-06
12.	Structure and contents of annual report of nuclear and radiation safety of the objects of nuclear fuel cycle	RB-043-08
13.	Dynamic monitoring of the building constructions of the objects of use of atomic energy	RB-045-08
14.	Monitoring of the meteorological and aerological conditions in areas of location of objects of use of atomic energy	RB-046-08
15.	Methodology of the assessment of the safety culture level at the enterprises of the nuclear fuel cycle	RB-047-08
16.	Life extension of the transportation package units, used for transportation of the spent nuclear fuel	RB-048-09
17.	Safety assessment of the management of the radioactive wastes of Techa cascade of reservoirs by their reprocessing and storage	RB-049-09
18.	Structure and contents of report substantiating safety of storage facilities for solid radioactive wastes	RB-050-09
19.	Provision on the assignment of the nuclear materials to the category of radioactive wastes	RB-052-10
20.	Provision on the enhancement of the precision of the prognostic assessments for radiation characteristics of radioactive environmental contamination and dose exposures of personnel and population	RB-053-09
21.	Provision on the structure and contents of report substantiating safety of near-surface storage facilities of radioactive wastes	RB-058-10

7. Guiding Documents of Rostekhnadzor

№	Title of the document	Reference number
1.	Provision on the organization of the State supervision over the safety by the use of atomic energy	RD-03-43-98
2.	Instruction for the implementation of the supervision over nuclear and radiation safety of nuclear power plants	RD-04-18-99
3.	Provision on the granting of the permissions giving right to carry out works in the field of use of atomic energy by the Federal environmental, industrial and nuclear supervision service of Russia to the personnel of nuclear power plants	RD-04-29-99
4.	Instruction for the implementation of the supervision over nuclear and radiation safety of objects of nuclear fuel cycle	RD-05-19-99
5.	Provision on the granting of the permissions giving right to carry out works in the field of use of atomic energy by the Federal environmental, industrial and nuclear supervision service of Russia to the personnel of the storage facilities for radioactive wastes (specialized enterprises for the management of radioactive wastes) and to the personnel of the enterprises (institutions, organizations), operating radiation sources	RD-07-14-2001
6.	Standard program of the special-purpose inspection of the status of the radiation safety on the objects of national economy	RD-07-13-2001
7.	Standard program for the comprehensive inspection of the nuclear and radiation safety to be provided in the enterprises of the nuclear fuel cycle	RD-05-02-2003
8.	Instruction for the review of application and documents submitted to obtain a license for an activity in the field of use of atomic energy by the central authorities of Federal environmental, industrial and nuclear supervision service	RD-03-08-2004
9.	Instruction for the implementation of the supervision over safety by the transportation of nuclear materials	RD-06-01-2004
10.	Provision on the organization of the work to train and qualify the specialists of the organizations to be supervised by the Federal environmental, industrial and nuclear supervision service	RD-03-19-2007
11.	Provision on the organization of the work to train and qualify the specialists of the organizations to be supervised by the Federal environmental, industrial and nuclear supervision service	RD-03-19-2007
12.	Standard program for the inspection by the implementation of the State building inspection at the objects of use of atomic energy	RD-11-08-2008
13.	Provision on organization of the professional training of employees of the Federal environmental, industrial and nuclear supervision service	RD-20-06-2008
14.	Provision on the administrative regulation	RD-01-01-2008
15.	Administrative regulations for the implementation of the State function to license the activities in the field of use of atomic energy by the Federal environmental, industrial and nuclear supervision service	№ 262 of November 16, 2008
16.	Provision on the quality system of Federal environmental, industrial and nuclear supervision service in the field of State safety regulation by the use of atomic energy	RD-03-29-2008
17.	On the approval of the procedure for granting of the permissions giving right to carry out the works in the field of use of atomic energy to the workers of the enterprises of fuel cycle, which have nuclear hazardous and radiation hazardous parts, enterprises (organizations) operating the industrial reactors, enterprises (organizations) carrying out the transportation of the nuclear materials, radioactive substances and items made on their basis	Order of Minprirody of Russia № 222 of 22.07.2009
18.	Procedure for granting of the permissions giving right to carry out the works in the field of use of atomic energy to the workers of the enterprises of fuel cycle, which have nuclear hazardous and radiation hazardous parts, enterprises (organizations) operating the industrial reactors, enterprises (organizations) carrying out the transportation of the nuclear materials, radioactive substances and items made on their basis	Order of Minprirody of Russia № 22 of 22.07.2009

Appendix F. Facility Category of Hazard

The categorization of the facilities of potential radiation hazard is introduced by the regulation «Basic Sanitary Rules of Radiation Safety» (OSPORB-99).

Facility Category of Radiation Hazard

Facility category of radiation hazard	Type of potential radiation hazard of a facility
I	Radiation impact on the population is possible in an accident, measures to protect the population may be required
II	Radiation impact in an accident is limited by the territory of the CA
III	Radiation impact in an accident is limited by the territory of the facility
IV	Radiation impact in an accident is limited by the premises where the radiation sources are handled