THE 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
second Review Meeting
in frames of the Joint Convention
on the Safety of Spent Fuel
Management and the Safety of
Radioactive Waste Management

Moscow 2006

This first 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 and compliance with them by the Russian Federation.

The Report has been prepared by the Federal Atomic Energy Agency with involvement of:

- Federal Environmental, Industrial and Nuclear Supervision Service
- Federal Agency for Construction and Housing Utilities
- Federal Medical and Biological Agency
- Nuclear Safety Institute of the Russian Academy of Sciences (IBRAE RAS)

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List of Abbreviations

AMB - An abbreviated name of a nuclear reactor type
ARMS - Automated Radiation Monitoring System
BN - fast neutron reactor
Bq - Becquerel (activity unit of measurement)
CA - Critical Assembly (see context)
CA - Controlled Area (see context)
Ci - Curie (activity unit of measure)
CMP - Chepetsk Mechanical Plant
CMW - Chemical Metallurgy Works, Krasnoyarsk
DAC_{publ} - Derived Air Concentration for the public
EDR - Equivalent Dose Rate
EGP - Graphite loop-type power reactor
ETC - Emergency Technical Center
FA - Fuel Assembly
FL - Federal Law
FR - Fuel Rod
FSUE - Federal State Unitary Enterprise
FTP - Federal Targeted Program
HMP - Hydrometallurgical Plant , Lermontov
GSP NFCF - General Safety Provisions for Nuclear Fuel Cycle Facilities
Gy - Grey (absorbed dose unit of measure)
HCS - Harmful Chemical Substances
HLW - High Level Waste
HWR - Heavy-Water Reactor
IAEA - International Atomic Energy Agency
ICRP - International Commission for Radiation Protection
ILW - Intermediate Level Waste
IPPE - Institute of Physics and Power Engineering named after A.I. Leipunsky
IR - Ionizing Radiation
IRS - Ionizing Radiation Source
LLW - Low Level Waste
LRW - Liquid Radioactive Waste
MCC - Federal State Unitary Enterprise "Mining and Chemical Combine"
MSC - Murmansk Steamship Company
MOE - Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Natural Disaster Consequences
MRF - Mobile Reprocessing Facility

NFC - Nuclear Fuel Cycle
NIIAR - Federal State Unitary Enterprise "State Research Center of the Russian Federation - Research Institute of Atomic Reactors"
NIF - Nuclear Icebreaker Fleet
NM - Nuclear Materials
NPI - Nuclear Power Installation
NPP - Nuclear Power Plant
SJR - Safety Justification Report
OSPORB - Basic sanitary rules of radiation safety
PMCPA - Priargunskoye Mining and Chemical Production Association
PUE - Rules of layout of electrical installations
RD - Regulatory Document
R&D - Research and Development
RBMK - Uranium-graphite large capacity channel-type reactor
REML - RadioEcological Monitoring Laboratory
RF - Russian Federation
Rosatom - Federal Agency of Atomic Energy
Rostechnadzor - Federal Environmental, Industrial and Nuclear Supervision Service
RR - Research Reactor
RS - Radioactive Substances (see context)
RSS - Radiation Safety Standards
RTG - Radioisotope Thermoelectric Generator
RW - Radioactive Waste
SC Radon - Special Combine Radon
SCA - SubCritical Assembly
SCC - Federal State Unitary Enterprise "Siberian Chemical Combine"
SCR - Self-sustained Chain Reaction
SFA - Spent* Fuel Assembly
SNF - Spent* Nuclear Fuel (termed "irradiated" in a number of regulations of the Russian Federation)
SPDS - Safety Parameter Display System
SRW - Solid Radioactive Waste
Sv - Sievert (equivalent dose unit of measure)
SZ - Surveillance Zone
TPP - Thermal Power Plant
VNIIAES - All-Russia Research Institute of Nuclear Power Plant Operation
WWER - water-cooled water-moderated power reactor

Section A. Introduction

A.1. Purpose of the Report

The Russian Federation submits this report for review at the second meeting of the Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (the Convention).

The purpose of the National Report is to inform on the compliance with the obligations undertaken by the Russian Federation in accordance with the Convention. The scope of application of the National Report is given in Section C.

A.2. Structure of the Report

This report is the first National Report which summarizes the approach of the Russian Federation to safety of the management of spent nuclear fuel and safety of the management of radioactive waste.

The report is formatted and structured in accordance with the recommendations "Guidelines Regarding the Form and Structure of National Reports" (INFCIRC/604). The sections listed below describe how the obligations under the Convention are complied with.

Section	Section title	Article of the Convention
A	Introduction	
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A.3. Main Topics of the Report and Near-Term Initiatives

National Policies of the Russian Federation in Nuclear Power Development and Nuclear and Radiation Safety

The main direction of the Russian power generation development is determined in the "Energy Strategy of Russia until 2020" according to which nuclear power is to play a significant role. This role has ever more increased recently because of the task to increase a nuclear electricity share in the total electricity generation up to 25% and to develop international cooperation in nuclear power.

In 2003 the President of the Russian Federation approved the "Basics of the State Policy in the Field of Nuclear and Radiation Safety of the Russian Federation until 2010 and beyond". This document defines long-term goals, priority directions, main principles and tasks of the state policy in nuclear and radiation safety of the Russian Federation as well as the programmatic planning and management in this area.

The goal of the state policy in ensuring nuclear and radiation safety is the gradual reduction down to the acceptable level of man-induced impacts to the population and environment in the course of the use of atomic energy and reduction of impacts from naturally occurring ionizing radiation sources down to permissible norms.

To achieve this goal it is necessary to focus efforts and resources on the following priority areas:

- the improvement of the state management and coordination of works in the field of nuclear and radiation safety, primarily, of the state system of radiation safety ensurance in the Russian Federation, which is carried out taking account of international practices;
- the improvement of the state regulatory activities in the field of use of atomic energy including the improvement of efficiency of licensing and safety reviews in this area;
- the strengthening of protection of nuclear and radiation hazardous facilities against man-induced, natural and terrorist effects, ensurance of a higher degree of protection of the population and environment against adverse factors associated with the use of atomic energy and natural ionizing radiation sources;
- the improvement of security systems and equipment of nuclear facilities, improvement of their anti-sabotage and anti-terrorist resistance;
- the intensification and improvement of work to dispose of decommissioned nuclear hazardous facilities and materials;
- the remediation of the Russian Federation territories featuring unfavorable radiation situation;
- the conduct of radiation and epidemiological studies to evaluate health of individuals affected by radiation;

- the improvement of medical support and system of rehabilitation of the personnel of nuclear and radiation hazardous facilities and population;
- the improvement of effectiveness of the international cooperation in the field of nuclear and radiation safety.

Legislative and Regulatory System

Relations in the field of spent fuel management and of radioactive waste management are regulated on the basis of the Constitution of the Russian Federation as the Basic Law having the supreme legal force and direct action, federal laws of the Russian Federation, legal acts by the President of the Russian Federation and the Government of the Russian Federation, federal norms and rules in the field of use of atomic energy, regulations of the state safety regulatory authorities and regulations of the authorities controlling the uses of atomic energy, standards, building standards and rules.

The essential laws which directly regulate relations in the field of safety include Federal Laws: "On the Use of Atomic Energy", "On the Radiation Safety of the Public", "On the Environmental Protection", "On the Sanitary and Epidemiologic Well-Being of the Public".

In 2001 the Federal Law "On Amendments to the Federal Law "On the Use of Atomic Energy"" was adopted to determine a legal rule according to which the exportation from the Russian Federation and importation to the Russian Federation of fuel assemblies of nuclear reactors is carried out in accordance under conditions of civil acts and the procedure of their exportation from the Russian Federation and importation to the Russian Federation is determined by the Government of the Russian Federation. Also, the Federal Law "On Special Environmental Programs of Rehabilitation of Areas of Territories Contaminated with Radiation" was adopted. The adopted legislation has formed the basis for a number of decrees by the Government of the Russian Federation, which regulate the procedure for the exportation from the Russian Federation and importation to the Russian Federation of FAs of nuclear reactors.

In 2002 the Federal Law "On Technical Regulation" was adopted. It establishes that the mandatory requirements for products, processes of production, operation, storage, shipment can be established only by technical regulations. Technical regulations are adopted through a federal law, decree of the President of the Russian Federation or decree of the Government of the Russian Federation.

Technical regulations must be adopted within seven years commencing the date the Federal Law "On Technical Regulation" entered into force.

The mandatory requirements for safety of products, processes of production, operation, storage, shipment for which the technical regulations will not be adopted within the set period of time are to be terminated when this period expires.

In this regard the work is carried out to develop technical regulations in the field of nuclear and radiation safety. These documents will include mandatory requirements resulting from the federal norms and rules.

In 2003 the Federal Law "On Changes and Amendments to Article 5 of the Federal Law "On the Use of Atomic Energy"" was adopted. It stipulates that non-defense radioactive sources, radioactive substances and radioactive waste, which does not contain nuclear materials, can be owned not only by the state, federal subjects of the Russian Federation and municipalities but also by legal entities. With that, the said entities can effect transactions with the above said objects provided they have permits (licenses) for carrying out works in the field of use of atomic energy and the ownership right for these objects is obtained or terminated on grounds defined in the civil legislation of the Russian Federation.

It should be noted that in 2001 the Code of Administrative Violations of the Russian Federation was adopted to include, in particular, the basic provisions of presently cancelled (by entering into force of the said Code) the Federal Law "On the Administrative Liability of Organizations for Violation of the Legislation in the Field of Use of Atomic Energy".
Section E describes in detail the legislative and regulatory system of the Russian Federation.

Near-term Initiatives in Regulation of RW Management Relations

"The Basics of the State Policy in the Field of Nuclear and Radiation Safety of the Russian Federation until 2010 and beyond" envision the establishing in the Russian Federation of a unified, effective, safe, cost-effective and socially acceptable state-level system of RW management, which ensures the broader use of atomic energy to solve tasks of national, energy and ecology security and involvement of secondary recovered and used raw materials in economy.

According to the obligations undertaken by the Russian Federation concerning the Joint Convention on the Safety of SNF Management and the Safety of RW Management, the RW management system must envisage the ultimate responsibility of the state for RW management safety.

Main objectives of the establishing the state unified system of RW management are:

- the state guarantees of the safe RW management;
- minimization of RW resulting from radioactive material handling;
- conversion of accumulated RW into safer forms.

Main principles of the state unified system of RW management are:

- ultimate isolation of RW;

- mandatory declaring by organizations involved in radioactive material management which produce RW the volumes and parameters of resulted and temporarily stored RW;
- mandatory state registration of storage facilities and RW ultimate isolation facilities
- state ownership of the RW ultimate isolation facilities;
- economic incentives for organizations, which handle radioactive materials, to minimize volumes and activities of RW;
- possibility for involvement of organizations of different forms of ownership in solving tasks of RW management;
- state control and state regulation of safety of RW management;
- system of permits (licensing) of RW management;
- compliance with international recommendations concerning RW management;
- secured financing of work to build and operate facilities for long-term storage and ultimate isolation of RW, which life cycle must be 100 to 300 and more years.

Section B. Policies and Practices (Article 32)

Article 32. Reporting

1. In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention.

For each Contracting Party the report shall also address its

i. spent fuel management policy
ii spent fuel management practices
iii. radioactive waste management policy
iv. radioactive waste management practices
v. criteria used to define and categorize radioactive waste

B.1. SNF Management Policy

The national SNF management policy is based on the concept that is founded on the principle that SNF is not radioactive waste, i.e. radioactive materials which are not subject for further use. According to the concept, "SNF is a valuable secondary feed for producing nuclear fuel components and a number of radioactive isotopes used in medicine, agriculture, and industry". Strategic directions of the SNF management are the establishing of a reliable system for long-term controlled storage of SNF, development of SNF reprocessing and balanced involvement of the SNF recovery products into NFC.

B.2. SNF Management Practices

This section presents general information about the national policy of the SNF management.

The safety of the spent nuclear fuel management (as well as RW) is ensured by three constituents:

- technical support of the facility safety (quality of design, construction, operation and decommissioning; availability of necessary monitoring, control and protection systems);
- avalailability of the effective regulatory basis (federal laws and other legal acts which define legal norms and principles of the responsibility in the field of nuclear and radiation safety, safety norms and rules, guides, procedures and other documents);
- training of the personnel (competence, qualification, work permit system, dicipling, accounting of human factor, higher requirements for the personnel health).

The national policy of Russia of the SNF management is based on the combination of SNF reprocessing and storage.

Besides the at-reactor storages at two Rosatom's combines (MCC and FSUE PA Mayak) there are pool-type storage facilities for SNF of the national NPPs and nuclear-propulsion installations; these facilities have storage capacities of 6000 and 2500, correspondingly.

Since 1977 the Russian Federation has operated the SNF reprocessing plant RT-1 at PA Mayak which has a capacity of 400 tons per year. The plant reprocesses SNF of WWER-440 power reactors of Russia and NPPs built to the Russian designs, as well as that of BN-350, BN-600, nuclear-propulsion reactors of nuclear icebreakers and RRs.

SNF of the Russian Reactors

As of 01.01.2006, Russia operates 31 nuclear power units with a total power capacity of 23242 MW. Appendix B1 lists data of the current situation and projections regarding accumulation of SNF of different reactors.

SNF of WWER-440 Reactors

Russia operates 6 units with WWER-440 type reactors which produce 87 tons of SNF annually. After the at-reactor hold-up during 3 to 5 years the WWER-440 SNF if shipped to RT-1 at PA Mayak for reprocessing.

SNF of WWER-1000 Reactors

Russia operates 9 units with WWER-1000 type reactors, which produce 190 tons of SNF annually. After the 3 to 5-year hold-up the SNF is shipped from NPPs to the centralized storage facility at MCC.

SNF of RBMK Reactors

Presently, 11 Russian RBMK-1000 type reactors are in operation. Annually, they produce 550 tons of SNF. The SNF is stored under water in at-reactor hold-up pools and separate SNF storage facilities; SNF is not reprocessed. Today, over 10000 tons of SNF with a total activity of more than 3 billion curies are stored on NPP sites. At present, the RBMK SNF is not shipped from NPP sites.

SNF of BN-600 Reactor at Beloyarsk NPP

Annually, the BN-600 reactor produces 6.2 tons of SNF, which is stored on site and after hold-up is sent to RT-1 for reprocessing.

SNF of AMB Reactors at Beloyarsk NPP

Two AMB reactors of Beloyarsk NPP were shutdown in 1989. The SNF was unloaded from the reactors and now is stored in shrouds in dry tubes (5000 SFAs) and in the wet storage facility at PA Mayak (2200 SFAs).

SNF of EGP-6 Reactor at Bilibino NPP

Bilibino NPP includes four similar power units with EGP-6 reactors (water-graphite heterogeneous channel-type reactor). A total number of SFAs is 4600 pieces. All are stored on-site.

SNF of Research Reactors

There are 31 RRs in Russia, of which 23 are in operation, 3 are under refurbishment, 3 have been finally shut down and 3 are being decommissioned; besides, there are several dozens of critical and subcritical assemblies. In recent years the SNF of RR has been accumulated both in interim storage facilities of the research centers and has been reprocessed.

Owing to a great variety of fuel rod and SFA designs, differences in fuel compositions and structural materials, a decision should be made for each RR, CA and SCA regarding the selection of a technology for reprocessing or long-term storage.

SNF of Nuclear Icebreaker Fleet

Russia operates 7 nuclear-propelled icebreakers: *Arktika* (1975), *Sibir* (1978), *Rossija* (1985), *Taimyr* (1988), *Sovetsky Soyuz* (1989), *Vaigach* (1990), Yamal (1992) and icebreaker lighter ship *Sevmorput* (1988). The icebreaker *Lenin* retired in 1989.

The nuclear icebreaker SNF is temporary stored on board of floating maintenance bases (FMB) *Lepse, Lotta* and *Imandra* and at the accumulation pad at FSUE Atomflot and then is shipped to PA Mayak.

In 2006 the construction of the container storage facility for icebreaker fuel (SNF CSF) will be completed. Then the fuel that cannot be reprocessed at PA Mayak will be unloaded from FMB storages of the *Lotta* and transferred in TUK-120 containers to FSUE Atomflot for the 50-year storage.

SNF of Foreign Reactors

Outside of the Russian territory, there are (were) in operation the NPPs with reactor installations of WWER-1000 and WWER-440 types as well as RRs which use the Russia-made fuel. A part of this fuel has been returned or will be returned to the Russian Federation.

The Russia-made fuel has been used at other NPPs, as well.

Commencing 1999 and until now the international cooperation of the Russian Federation in the power reactor SNF management services has been carried out with Bulgaria and Ukraine, and in management of the RR SNF – with Uzbekistan.

According to the existing contracts the MCC storage facility receives WWER-1000 fuel and the SNF of WWER-440; the SNF of research reactors is received at PA Mayak for reprocessing.
A more detailed description of the foreign reactor SNF management is given in Appendix B1.

B.3. Criteria for Defining and Categorizing Radioactive Waste

According to the FL "On the Use of Atomic Energy", radioactive waste comprises nuclear materials and radioactive substances which are not intended for further use.

In terms of the state of aggregation the RW is divided into liquid, solid and gaseous waste.

The liquid radioactive waste include organic and non-organic liquids, pulps and slug which are not subject to further use and which specific activity of radionuclides is 10 times higher the interference levels (given in Appendix P-2 to NRB-99) when absorbed with water.

The solid radioactive waste include radionuclide sources which have exhausted their service life, materials, products, equipment, biological objects, soil which are not subject for further use, as well as solidified liquid radioactive waste which specific activity of radionuclides is higher the values given in Appendix P-4 to NRB-99, and when their radionuclide composition is unknown when their specific activity exceeds:

- 100 kBq/kg for beta-emitting sources;
- 10 kBq/kg for alpha-emitting sources;
- 1.0 kBq/kg for transuranic radionuclides.

The gaseous radioactive waste include radioactive gases and aerosols which are not subject for further use and which are generated by the production processes and which have a volume activity exceeding DAC values given in Appendix P-2 to NRB-99.

In terms of specific activity the liquid and solid radioactive waste is divided into three categories: low-level, intermediate-level and high-level waste. The numerical values of criteria are given in Table B1.

Table B1. Specific activity of radioactive waste by waste categories

Waste category	Specific activity, Bq/kg (Bq/l)		
	β - and γ- emitters	α - emitters (excluding transuranic)	Transuranic elements
Low level	Less than 10^6	Less than 10^5	Less than 10^4
Intermediate level	10^6 up to 10^{10}	10^5 up to 10^9	10^4 up to 10^8
High level	More than 10^{10}	More than 10^9	More than 10^8

According to requirements of norms and rules the near-surface disposal of HLW is prohibited. The federal rules and standards (NP-055-04) establish permissible levels of content of separate radionuclides for the near-surface disposal of RW. The values are given in Appendix B2.

B.4. Radioactive Waste Management Policy

The Russian Federation state policy in the field of the RW management envisages well-directed activities to prevent adverse radiation impacts on humans and environment at all stages of the waste management (generation, collection, transportation, reprocessing, storage).

Main tasks of the state system of RW management are: ensurance of sustainable development and protection of national interests of the state, protection of civil rights guaranteed by the Constitution for protection of health, favorable environment and credible information about its conditions.

The Russian Federation state policy is formed on the basis of:

- the internationally accepted approaches and directed to safe management of RW in the current period and long-term future;
- the fundamental knowledge in the field of nuclear science and technology, ecology, reasonable use of nature and environmental protection, protection of health, radiation and common industrial safety.

On the whole it is aimed at achieving the internationally accepted level of safety of the RW management.

In the Russian Federation the present-day and near-term optimal strategy is the improvement of technologies for RW reprocessing and conditioning followed by controlled storage which provides for a possibility of near-surface or deep geological disposal. With that, the technical solutions must envisage the implementation of the principle of safe management of RW over the entire period of its potential danger. In parallel, other RW management options can be worked on.

The legal basis of the RF policy in the field of the RW management is the Constitution and legislation of the Russian Federation, norms of the international law and provisions of international agreements.

The legislation of the Russian Federation in the field of RW management is regulated by the Constitution of the Russian Federation and includes:

- the Federal Law "On the Use of Atomic Energy",
- the Federal Law "On the Radiation Safety of the Public",
- the Federal Law "On the Sanitary and Epidemiological Well-Being of the Public",
- the Federal Law "On the Environmental Protection" and other legislative and regulatory acts.

According to the legislation, the Government of the Russian Federation provides for the state-level control and accounting of RS and RW, including the information about generation, reprocessing, transfer and placement for a long-term storage and its ultimate isolation.

The safety of RW management is one of the most important constituent of the national security and essential condition of the peaceful uses of atomic energy today and in future.

B.5. Radioactive Waste Management Practices

The safety of radioactive waste management is ensured by three constituents similar to the given above in Section B.2 for SNF.

The current practices of RW management in the Russian Federation are characterized by the following approaches.
As a rule, NPPs and large NFC enterprises implement all stages of RW collection, reprocessing and long-term storage at their sites. The high- and intermediate-level LRW feature the largest number of the reprocessing stages. In recent years the amounts of high-level LRW being reprocessed exceed annually generated amounts, while these indicators for low-level LRW have nearly equaled.

The main bulk of the accumulated high-level waste is vitrified waste, fuel rod cladding, contaminated equipment, spent RS, which are kept at PA Mayak and SCC. This waste is located in specialized buildings or structures and isolated from the environment (Appendix B2). Three NFC enterprises inject low-level and medium-level short-lived LRW into deep reservoir beds in geological formations.

There is a network of regional special combines Radon which normally receive low- and intermediate-level RW from organizations which operate IRS and RS. The Radon enterprises reprocess RW and store it in the long-term. Some NFC enterprises also transfer RW being generated to the Radon combines.

The RW reprocessing and conditioning is carried out using the following installations: water treatment, ion exchange, coagulation, evaporation, deposition, inactivation, vitrification, bituminization, calcinations, fractionation, compaction, melting, decontamination, incineration, cement solidification, other types of installations.

For the coming years the main task is to reduce the fraction of waste which is stored non-isolated from the environment and to build new RW conditioning capacities.

Due to expansion of decommissioning activities at nuclear and radiation hazardous facilities, increase in the volumes of generated RW is anticipated.

The safety ensurance at the RW management is described in more detail in Section H.

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 covered 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 materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or 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 defence programmes, 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 defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.*
4. *This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.*

C.1. The Russian Federation declares that:

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

C.2. The 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 and that does not originate from NFC unless its constitutes a disused sealed source or it is declared as radioactive waste for the purposes of the Convention by the Contracting Party.

C.4. The Russian Federation declares that:

it will consider discharges as provided for in Articles 4, 7, 11, 14, 24 and 26 of the Convention.

Explanation:

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

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.

A list facilities for SNF storage and reprocessing is given in Table B.1.1 of Appendix B1. The Russian Federation has accumulated about 18500 tons of SNF which is held in on-site and at-reactor storage facilities, as well as the SNF reprocessing enterprises (Table B.1.2 of Appendix B1.

Besides, a certain amount of spent nuclear fuel of the nuclear icebreaker fleet is held on the floating maintenance bases (FMB) *Lepse*, *Lotta* and *Imandra*. The SNF of the civilian nuclear fleet is stored on technical support ships of FSUE Atomflot. The FMB *Lotta* and *Imandra* store 674 shrouds (13 cores) with ureprocessible uranium-zirconium SNF. The FMB *Lepse*, which is not in operation, stores 626 SFAs.

At present, over 90 installations for reprocessing of different types of RW (Table B.1.3 of Appendix B1) are in operation (commercial or pilot). In addition, over 30 more installations are at different stages of development (design, laboratory-scale tests, mock-up development).

All enterprises are equipped with installations for clean-up of environmental releases and discharges. A number of enterprises feature RW reprocessing technologies which are most necessary for their activities.

The installations of highest reprocessing capacity include:

- Re-melting — Ecomet-S (SRW, LLW; 2000 tons/year),
- Vitrification — SUE MosNPO Radon (LRW, ILW; 200 l/h),
  FSUE PA Mayak (LRW, HLW; 300-500 l/h)

- Incineration — SUE MosNPO Radon (LRW ILW; 20 l/h; SRW ILW; 60 kg/h)
- Cement solidification — at NPP, a standard installation (LRW, SRW, ILW; 255 m^3/year)

Some enterprises show a trend to establish on-site RW management complexes.
The most fitted complexes are at SUE MosNPO Radon (bituminization, vitrification, compaction, incineration…), Balakovo NPP (bituminization, compaction, incineration, cement solidification…).

The RW generation sources:

- mining and processing of radioactive ores, fabrication of nuclear fuel;
- electricity production at NPPs;
- SNF reprocessing;
- use of NM, RS and IRS in industry, medical institutions, research institutes etc.

An average annual amount of RW (over recent three years) is:

- 4.3 mln m^3 of LRW with a total activity of $3.72*10^{18}$ Bq. According to classification adopted in the Russian Federation, this waste is divided into low-level waste (93.6% of the total amount; activity of $6.72*10^{14}$ Bq), intermediate-level waste (6% - $4.08*10^{17}$ Bq), and high-level waste (0.4% - $3.31*10^{18}$ Bq);
- more than 1 mln t of SRW, of which 96.2% in terms of mass is low-level waste of ore processing; its total activity is $1.36*10^{14}$ Bq or 0.08% in terms of activity of all SRW being generated.

In addition, the reprocessing of high-level LRW at FSUE PA Mayak produces annually on average some 500 tons of secondary vitrified waste with a total activity of about $1.5*10^{18}$ Bq.

Major amounts of RW are located in 33 regions of the RF at 69 enterprises in 1170 temporary storage facilities and in three deep geological facilities.
More detailed information on quantities of RW and its characteristics are given below.

As of the end of 2005, more than 470 mln m^3 ($4.4*10^{19}$ Bq) of LRW and 75 mln t of SRW ($1.43*10^{19}$ Bq) have been accumulated.

At present, the storage facilities that are not isolated from the environment hold about 10% (in terms of activity) of intermediate-level LRW. An amount of high-level LRW is less than 0.01% of its total amount and its activity is about 35 % of the total activity of LRW. All high-level LRW is isolated from the environment.

Of 75 mln tons of SRW accumulated by the nuclear facilities the main bulk is low-level waste and over 95% of it is held at enterprises which mine and process ores. With this, the main activity (99.8%) is concentrated within high-level SRW reliably isolated from the environment; its mass is about 55,000 tons.

The main bulk of the accumulated high-level waste is the vitrified waste, fuel rod cladding, metal waste contaminated with radionuclides, contaminated equipment, spent RS, including RTGs. This waste is held in specialized buildings and isolated from the environment.

The Russian Federation is decommissioning 4 nuclear power units and 9 NI of research reactors. A list of the installations is given in Table B.1.4 of Appendix B1.

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 law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention.*

The existing legislation of the Russian Federation in the field of the safety of management of spent nuclear fuel and the safety of management of radioactive waste allows to a substantial degree to comply with the obligations resulting from the Joint Convention.

The Government of the Russian Federation will determine functions, responsibilities and interaction procedure for the federal executive bodies as regards the compliance with the obligations of the Russian Federation resulting from the Convention.

The entering into force of the FL of the Russian Federation "On Ratification of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management" (No139-FZ of November 04, 2005) means that the existing Russian legislation does not contradict the obligations of the Russian Federation resulting from the Convention.

The Convention is a necessary element of the system of the international nuclear legislation on the safe management of spent nuclear fuel and radioactive waste.

The adoption of this Federal Law has made the provisions of the Convention binding for all executive bodies and organizations involved in the management of SNF and RW.

The Convention serves as the basis for further improvement of the Russian legal and normative acts which regulate issues of the safe management of spent nuclear fuel and radioactive waste in accordance with obligations of the Russian Federation resulting from provisions of the Convention.

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

Article 19. Legislative and Regulatory Framework

19-1 Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.

19-2 This legislative and regulatory framework shall provide for:

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

ii) a system of licensing of spent fuel and radioactive waste management activities;

iii) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;

iv) a system of appropriate institutional control, regulatory inspection and documentation and reporting;

v) the enforcement of applicable regulations and of the terms of the licences;

vi) a clear allocation of responsibilities of the bodies 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 take due account of the objectives of this Convention.

Main legislative and normative documents which regulate the safety of spent nuclear fuel management and the safety of radioactive waste management in the Russian Federation are given in Appendix E.

E.2.1. Legislative and Regulatory framework of safety ensurance (Article 19-1)

Article 19. Legislative and Regulatory Framework

19-1 Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.

In the Russian Federation the federal laws "On the Use of Atomic Energy" № 170-FZ of 21.11.1995 with supplements and "On the Radiation Safety of the Public" № 3-FZ of 09.01.1996 with the supplement form the legislative basis for regulating nuclear and radiation safety of the personnel, population and environment.

A list of other federal laws used in regulating the safety of spent fuel management and the safety of radioactive waste management in the Russian Federation is given in Appendix E.

Article 6 of the Federal Law "On the Use of Atomic Energy" stipulates that the federal norms and rules in the field of use of atomic energy establish requirements for the safety of management of SNF and RW (the regulatory basis).

The list of the federal norms and rules in the field of use of atomic energy and their development procedure are determined in the order of the Government of the Russian Federation No 1511 of 01.12.1997.
The federal norms and rules which establish requirements for the safety of management of spent nuclear fuel and radioactive waste have been developed and put into force regarding different nuclear facilities (nuclear power plants, nuclear fuel cycle facilities, research reactors, industrial enterprises, science, medicine).
A list of main federal norms and rules related to this Convention is given in Appendix E.

The regulation of the safety of spent nuclear fuel and radioactive waste management is also carried out on the basis of safety guides and guiding documents of the safety regulatory authorities, the documents which are developed by bodies which control on behalf of the state the uses of atomic energy (institutional documents) and state and industry-wide standards.

The Russian Federation is developing the Federal Law "On the Radioactive Waste Management". The Russian Federation Government's decree No 2237-r of 17.12.2005 establish the deadline for the Federal Law development (2007).

E.2.2. The Constituent Parts of Legislative and Regulatory Framework (Article 19-2)

E.2.2.1 National Radiation Safety Requirements (Article 19-2(i))

> ***Article 19. Legislative and Regulatory Framework***
>
> *19-2 This legislative and regulatory framework shall provide for:*
>
> *i) the establishment of applicable national safety requirements and regulations for radiation safety*

A list of main documents containing radiation safety requirements is given in Appendix E.

Federal Law "On the Use of Atomic Energy"

The law defines the legal basis and principles for regulating the relations arising from the uses of atomic energy and is aimed at protecting human health and life, protection of the environment, protection of property in the course of the use of atomic energy. The law determines the activities in the field of use of atomic energy subject to licensing by the state safety regulatory authorities.

Federal Law "On the Radiation Safety of the Public"

The law defines the legislative bases of radiation safety ensurance of the population to protect their health. The law establishes main principles of the radiation safety ensurance, main hygienic standards (permissible dose limits) of exposure in the

territory of the Russian Federation as resulting from the use of ionizing radiation sources.
The dose limit values for personnel and public exposure stipulated by this law are given in Section F.4.

Federal Law "On the Sanitary and Epidemiological Well-Being of the Public"

The law defines the legislative bases of the ensurance of the sanitary and epidemiological well-being of the population. The law establishes sanitary and epidemiological requirements for industrial and technical products, production premises, conditions of work with physical factors which impact man, aquatic objects, atmospheric air, soil.

Federal Law "On the Environmental Protection"

The law defines the legislative bases of the state policy in the field of environmental protection. The law determines main principles of the environmental protection, permissible norms of impacts to the environment, including limits for the production waste placement.

Federal Law "On the Environmental Review"

The law regulates relations in the field of the state and public environmental review process. The law identifies objects and the procedure of the state compulsory environmental reviews at all tiers, as well as objects and conduct of the public environmental reviews.

Federal Law "On the Protection of the Public and Territories against Natural and Man-Induced Emergencies"

The law defines organizational and legislative norms in the field protection of the population, environment and industrial and social facilities against natural and man-induced emergencies. The law determines main principles of protection of the population and territories against emergencies, the procedure for preparing and responding in case of emergencies.

Transboundary movement

In the Russian Federation the international codes for shipment of dangerous goods (IMDG, ICAO, RID, ADR) and the federal norms and rules developed on their basis (Appendix E) represent the legislative basis for regulating safety during transboundary movements of nuclear materials (including spent nuclear fuel), radioactive substances and radioactive waste.

The Federal Law "On the Environmental Protection" prohibits importation of radioactive waste to the territory of the Russian Federation and establishes conditions for importation of SNF.

E.2.2.2. Licensing of the Spent Nuclear Fuel and Radioactive Waste Management Activities (Article 19.2(ii))

> ***Article 19. Legislative and Regulatory Framework***
>
> *19-2 This legislative and regulatory framework shall provide for:*
>
> *ii) a system of licensing of spent fuel and radioactive waste management activities;*

According to Article 26 of the Federal Law "On the Use of Atomic Energy", any activity in the field of use of atomic energy which is subject to licensing by the state safety regulatory authorities is prohibited if there is no a permit (license) for its conduct.

A list of activities in the field of use of atomic energy subject to lisensing, the procedure for granting and canceling a license are established in the Decree of the Government of the Russian Federation "Regarding the Federal Environmental, Industrial and Nuclear Supervision Service" No 865 of 14.07.1997. The list of activities related to this Convention includes:

a) siting, construction, operation and decommissioning of nuclear installations, radioactive sources and nuclear material and radioactive substance storage facilities and radioactive waste storage facilities;
b) management of nuclear materials and radioactive substances, including during exploration and mining of uranium ores, production, use, reprocessing, transportation and storage of nuclear material and radioactive substances;
c) management of radioactive waste during its storage, reprocessing, transportation and disposal;
d) the use of nuclear material and/or radioactive substances in research and development;
e) design and engineering of nuclear installations, radioactive sources and nuclear material and radioactive substance storage facilities and radioactive waste storage facilities;
f) design and manufacture of the equipment for nuclear installations, radioactive sources and nuclear material and radioactive substance storage facilities and radioactive waste storage facilities;
g) expert review of the design, engineering and process documentation as well as the documents which justify nuclear and radiation safety of nuclear installations, radioactive sources and nuclear material and radioactive substance storage facilities and radioactive waste storage facilities as well as activities related to the management of nuclear material, radioactive substances and radioactive waste.

According to the Provisions for the Federal Environmental, Industrial and Nuclear Supervision Service, as approved by the Decree of the Government of the Russian Federation "Regarding the Federal Environmental, Industrial and Nuclear Supervision Service" No 401 of July 30, 2004, "On the Federal Environmental, Industrial and Nuclear Supervision Service", the Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) is the state safety regulatory body which

regulates activities in the field of use of atomic energy and licenses activities in the field of use of atomic energy.

The positive statement of the state environmental review as well as the positive sanitary and epidemiologic statement issued by the sanitary and epidemiologic regulatory authorities are mandatory conditions to obtain the license for management of spent nuclear fuel and radioactive waste.

To follow up the provisions of the decree of the Government of the Russian Federation No 865 of 14.07.97, Rostechnadzor has approved and put into force the regulatory and guiding documents which define the procedure for review of applications and document submitted for getting the license for an activity in the field of use of atomic energy (RD-03-08-2004), as well as those which establish requirements for the composition and content of documents justifying safety of the licensed activity (for example, NP-051-04, NP-066-05, RD-05-15-2002 and other).

To improve the licensing process in the field of use of atomic energy, Rostechnadzor, by its order No 91 of 06.09.99, divided licensing authorities of the Headquarters and regional offices. According to this order, the licensing of a nuclear installation or storage facility of the federal or interregional significance is carried out by the Headquarters, and the installations of regional significance are licensed by the Rostechnadzor's regional offices.

Exemption from the Regulatory Control

The legislation of the Russian Federation does not assume exemption of SNF and RW from the regulatory control.

According to the radiation safety standards, the control does not cover radiation sources which, while handled under any conditions, produce:

a) an annual individual effective dose of not more than 10 μSv;

b) an annual individual equivalent dose to skin of not more than 50 mSv and to lens of not more 15 mSv;

c) an annual collective effective dose of not more than 1 man-Sv or when the collective dose is more than 1 man-Sv the assessment by the optimization principle demonstrate inexpedience of the collective dose reduction.

Also, no constraints are imposed on the use of any solid materials, raw materials and products in the economic activities, if their specific activity of radionuclides is less then 0.3 kBq/kg (provided the surface removable contamination of materials and products is absent). As agreed with the federal body authorized to carry out the state sanitary and epidemiological supervision, higher values of specific activity for raw materials, materials and products suitable for unrestricted use can be established with regard to certain beta-emitting radionuclides.

E.2.2.3. Prohibition of spent nuclear fuel and radioactive waste management without license (Article 19-2(iii))

> ***Article 19. Legislative and Regulatory Framework***
>
> *19-2 This legislative and regulatory framework shall provide for:*
>
> *iii) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;*

According to Article 26 of the Federal Law "On the Use of Atomic Energy", any activity in the field of use of atomic energy which is subject to licensing by the state safety regulatory authorities is prohibited if there is no a permit (license) for its conduct.

Article 14.1 of the Federal Law "The Code of the Administrative Violations of the Russian Federation" No 195-FZ of 30.12.2001 stipulates that the conduct of an activity without a license, if such license is mandatory, causes an administrative fine to be imposed on citizens, officials and legal entities, with the produced items, production tools and raw materials confiscated or not confiscated.

E.2.2.4. System of Institutional and Regulatory Control, Documentation and Reporting (Article 19-2(iv))

> ***Article 19. Legislative and Regulatory Framework***
>
> 19-2 *This legislative and regulatory framework shall provide for:*
>
> *iv) a system of appropriate institutional control, regulatory inspection and documentation and reporting;*

Institutional Control

The institutional supervision and control over SNF and radioactive waste management, documentation and reporting are carried out in accordance with division of responsibilities between the executive bodies and operating organization.

With that, the common functions are:

- planning, organization and conduct of inspections;
- development of the industry-wide safety standards, rules and requirements;
- analysis of plans, deviations and violations; development of recommendations;
- organization of and participation in granting permits;
- organization of training and qualifying the personnel;
- conduct and implementation of research and development results.

According to Article 35 of the Federal Law on the Use of Atomic Energy", the operating organization develops and implements measures to control safety of a nuclear installation, radiation source or storage facility. If the operating organization fails to

ensure safety of the said objects, the corresponding control body is made responsible for safety and proper handling until a new operating organization is identified.
Conditions of the license granted by the safety regulatory body establish that the operating organization must take corresponding measures to have the control, inspections and tests of the safety important equipment and systems carried out in accordance with the established procedures and schedules.

Regulatory Control

According to the decree of the Government of the Russian Federation No 401 of 30.07.2004, the Rostechnadzor controls and supervises over:

a) compliance with the norms and rules in the field of the use of atomic energy;
b) compliance with license conditions for execution of work in the field of use of atomic energy;
c) nuclear, radiation, industrial and fire safety (at nuclear facilities);
d) physical protection of nuclear installations, radiation sources, nuclear material and radioactive substance storage facilities, the systems for the state unified control and accounting of nuclear materials, radioactive substances and radioactive waste.

In accordance with its authorities the Rostechnadzor has approved and put into force the "Provisions for Organization of the State Supervision over the Safety of the Use of Atomic Energy" (RD-03-43-98), as well as guiding documents which determine the inspection procedures and scope of issues subject to the inspections (for example, RD-05-18-99, RD-05-02-2003 etc.).

Rostechnadzor's inspectors regularly inspect, at the level of a state authority, safety of all nuclear installations and storage facilities. Annually, Rostechnadzor writes inspection plans for both the representatives of regional offices (targeted, operative) and representatives of the Headquarters of Rostechnadzor (comprehensive).

Each nuclear installation and storage facility which represents a significant potential danger is supervised by a designated inspector of Rostechnadzor. As a rule, there are several inspectors of Rostechnadzor at large nuclear facilities which house a number potentially hazardous installations (for example, FSUE SCC, RSC RF NIIAR etc.).

According to the decree of the Government of the Russian Federation No 865 of 14.07.97, the Rostechnadzor, when reviewing a license applications for an activity in the field of use of atomic energy, organizes and carries out an inspection of whether the applicant is prepared for such activity. A decision on granting or refusal to grant the license is made taking into account findings of the said inspection.

The sanitary and epidemiologic supervision authorities control over the compliance with the sanitary and hygienic norms and rules, including in the field of radiation safety. The said authorities issue sanitary and epidemiological statements as to whether a SNF and RW management installation or vehicles meet the requirements of sanitary norms and rules (Appendix E4).

Documentation and Reporting

The federal norms and rules establish requirements for the operating organization to prepare and submit periodic safety reports of a nuclear installation and storage facility to the state safety regulatory authorities and the state control authorities.

The operating organization must keep the design documentation, execution documentation of the construction, maintenance and repair of safety important systems (components), as well as the materials of the operational event investigations over the entire service life of a nuclear installation and storage facility.

The operating organization must transfer the information about events at a nuclear installation and storage facility to the state safety regulatory body in the field of use of atomic energy in accordance with the established requirements (for example, NP-047-03).

E.2.2.5. Measures Taken to Implement Existing Regulations and License Conditions (Article 19-2(v))

> ***Article 19. Legislative and Regulatory Framework***
>
> *19-2 This legislative and regulatory framework shall provide for:*
>
> *v) the enforcement of applicable regulations and of the terms of the licences;*

According to the decree of the Government of the Russian Federation No 865 of 14.07.97, the Rostechnadzor, at the level of the state, supervises over compliance with the license conditions by the license holder and if they are not complied with, impose sanctions as set forth by the legislation of the Russian Federation.

The Federal Law "The Code of the Administrative Violations of the Russian Federation" envisions administrative fines for citizens, officials and legal entities who fail to obey a binding directive or demand by an official of the state supervision body or prevents such official from fulfilling his duties, as well as carrying out the activity while breaching the license conditions.

The Federal Law "The Code of the Administrative Violations of the Russian Federation" envisions the administratively imposed suspension of the activity for up to ninety days in case of the threat to life or health of people, initiation of a radiation accident or man-induced catastrophe, substantial damage to the environment.

The decree of the Government of the Russian Federation No 865 of 14.07.97 stipulates that should earlier unknown circumstances associated with safety of the licensed activity be revealed when new federal norms and rules in field of use of atomic energy are put into force, Rostechnadzor can demand the license holder to submit additional documents justifying safety of the activity being licensed and make a decision to amend the license conditions.

Rostechnadzor can revoke the license holder's right to carry out the activity declared in the license by suspending the license or canceling it in the following cases:

a) a violation by the license holder of federal laws or other legislative and regulatory acts of the Russian Federation in the field of use of atomic energy;

b) the finding of uncredible information in documents submitted to get the license;

c) breaching of the license conditions by the license holder;

d) a failure by the license holder to fulfill directives of Rostechnadzor or other state safety regulatory authorities in the field of use of atomic energy;

e) a failure by the license holder to fulfill directives or orders of the state bodies or the suspension by these bodies of the license holder's activities in accordance with the Russian Federation legislation.

E.2.3. Division of Responsibilities of the Bodies Involved at Different Stages of Spent Nuclear Fuel and Radioactive Waste Management

The Federal Atomic Energy Agency (Rosatom) is an authorized federal executive body, which introduces the state policy, legislatively regulates, renders on the state level the services and manages the state-owned property in the field of use of atomic energy, development and safe functioning of nuclear power, nuclear fuel cycle, nuclear science and technology, nuclear and radiation safety, non-proliferation of nuclear material and technology, as well as international cooperation in this area.

Rosatom is a state body for the control of the uses of atomic energy, the state competent authority for nuclear and radiation safety at shipments of nuclear materials, radioactive substances and products thereof, the central state body and point of contact as per the International Convention on the Physical Protection of Nuclear Materials and the national competent authority as regards fulfillment of obligations of the Russian Federation in the field of physical protection of nuclear material in the IAEA and other international organizations.

The Federal Atomic Energy Agency was established by a decree of the President of Russia No 314 of March 9, 2004 "On the System and Structure of the Federal Executive Bodies" on the basis of the abrogated Ministry of the Russian Federation of Atomic Energy. The decree of the President of the Russian Federation of May 20, 2004 "The Issues of the Structure of the Federal Executive Authorities" has expanded some of authorities of the Agency.

The Government of the Russian Federation controls the activity of the Federal Atomic Energy Agency.

According to the decree of the Government of the Russian Federation No 316 of June 28, 2004 "On the Approval of the Statute of the Federal Agency of Atomic Energy", the Agency, in particular, is entitled to perform the following functions:

- it performs the functions of the state customer – coordinator of works on the complex decommissioning of nuclear submarines and nuclear-propelled ships as well as the reduction of radiation hazard in their locations, ecological rehabilitation of facilities involved in the temporary storage of spent nuclear fuel, solid and liquid radioactive waste;
- it performs the functions of the state customer – coordinator of special ecological programs;
- it makes decisions regarding the acknowledgement of an organization capable of operating a nuclear installation, radiation source or storage facility and carrying out, on its own or with involvement of other organizations, the siting, design, construction, operation and decommissioning of a nuclear facility, radiation source or storage facility, as well as managing nuclear materials and radiation substances;
- it maintains the state registry of nuclear materials;
- it provides information, analytical, document, legal and materiel support to the special commission on importation to the territory of the Russian Federation of foreign-made irradiated fuel assemblies;
- it grants to the supplier-countries assurances regarding the peaceful uses of the imported nuclear products and technologies, their security and conditions of subsequent transfer;
- it summarizes practices of the application of the legislation of the Russian Federation in the area of its jurisdiction;
- it arranges for professional training of the Agency's personnel, their re-training and advanced training and probation;
- it communicates with citizens, ensures timely and comprehensive review of verbal and written addresses of citizens, related decision-making and response to the applicants within the timeframe established by the legislation of the Russian Federation;
- in accordance with the legislation of the Russian Federation, it compiles, keeps and uses archived documents resulted from the Agency's activities.

The Federal Agency for Construction and Public Utilities is authorized to exercise control, at the level of the state, over the uses of atomic energy as regards the management of low- and intermediate-level RW and IRS resulting outside the nuclear and power complexes of the country.
The Federal Agency for Construction and Public Utilities reports to the Ministry of Regional Development of the Russian Federation.

A number of agencies and services also perform certain functions related to the control of the use of atomic energy. At present, in accordance with the directive by the Administration of the Government of the Russian Federation No P7-24549, a draft decree of the Government of the Russian Federation has been prepared to entitle the federal executive bodies listed below to control over the uses of atomic energy at the level of the state:

- Federal Atomic Energy Agency,
- Federal Industry Agency,
- Federal Marine and River Transport Agency,
- Federal Education Agency,
- Federal Science and Innovations Agency,
- Federal Energy Agency,
- Federal Agency for Construction and Public Utilities (as regards the management of low- and intermediate-level RW and IRS resulting outside the nuclear and power complexes of the country),
- Federal Public Health and Social Development Agency,
- Federal Minerals Use Agency.

They are the bodies for the state-level control over the uses of atomic energy at their subordinate organizations as well as the organizations which activities are controlled and coordinated by these bodies.

E.2.4. Regulatory Body (Article 20)

Article 20. Regulatory Body

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

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 where organizations are involved in both spent fuel or radioactive waste management and in their regulation.

E.2.4.1. Safety Regulatory Bodies (Article 20.1)

Article 20. Regulatory Body

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

According to Article 23 of the Federal Law "On the Use of Atomic Energy" the control at the level of the state over the uses of atomic energy envisions activities of the federal executive bodies especially entrusted with that by the President of the Russian Federation or, by his directive, by the Government of the Russian Federation.

The decree of the President of the Russian Federation No 26 of 21.01.1997 identified the following state regulatory bodies for nuclear, radiation, industrial and fire safety at

the uses of atomic energy (revisions of the PF Presidential decrees No 444 of 17.04.03; No 649 of 20.05.04 and No 1304 of 11.10.2004):

a) Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor);
b) sanitary and epidemiological supervision bodies (Federal Consumer Rights and Human Well-Being Supervision Service, Federal Medical and Biological Agency);
c) Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters.

According to the decree of the Government of the Russian Federation No 401 of 30.07.2004, Rostechnadzor is:

a) the state safety regulatory body for the uses of atomic energy;
b) especially entrusted body in the field of industrial safety;
c) especially entrusted body in the field of the environmental review within its jurisdiction (also exercises the state environmental control);
d) especially entrusted body in the field of the atmospheric air protection.

According to the decree of the Government of the Russian Federation No 322 of 30.06.2004, the Federal Consumer Rights and Human Well-Being Supervision Service is a federal executive body which executes functions of the state sanitary and epidemiological supervision over the compliance with the sanitary legislation.

According to the decree of the Government of the Russian Federation No 206 of 11.04.2005, the Federal Medical and Biological Agency is a federal executive body which executes functions of control and supervision in the sphere of sanitary and epidemiological well-being of employees of organizations in certain industries which feature especially hazardous conditions of labor, and of the population of certain territories which are on the list which is approved by the Government of the Russian Federation.

According to the decree of the Government of the Russian Federation No 712 of 01.12.2005, the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters executes the state supervision in the field of protection of the population and territories against natural and man-induced emergencies.

Authorities of the state safety regulatory bodies are stipulated in Article 25 of the Federal Law "On the Use of Atomic Energy".

The jurisdiction, structure and human resources are stipulated by the corresponding decrees of the Government of the Russian Federation.

The financial resources are subject to annual approval by the State Duma of the Russian Federation and the Federal Council in frames of the Russian Federation budget for the current year.

Interaction of Regulatory Bodies

The decree of the President of the Russian Federation No 26 of 21.01.1997 stipulates that the state safety regulatory bodies can enter the cooperation agreements to improve effectiveness of the state regulation of nuclear, radiation, industrial and fire safety in the uses of atomic energy and to avoid duplication of the designated functions.

Gosatomnadzor of Russia (now Rostechnadzor) concluded agreements with other safety regulatory bodies regarding division of authorities of safety regulation in the field of use of atomic energy.

E.2.4.2. Independence of Regulatory Bodies (Article 20-2)

> ***Article 20. Regulatory Body***
>
> *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 where organizations are involved in both spent fuel or radioactive waste management and in their regulation.*

The state safety regulatory bodies are independent of other state bodies, as well as of organizations which activities relate to the use of atomic energy, as stipulated in Article 24 of the Federal Law "On the Use of Atomic Energy.

The Government of the Russian Federation commands the activities of Rostechnadzor (decree of the President of the Russian Federation No 649 of 20.05.04).

The President of the Russian Federation commands the activities of the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters (decree of the President of the Russian Federation No 649 of 20.05.04).

The Ministry of the Public Health and Social Development of the Russian Federation commands the activities of the Federal Consumer Rights and Human Well-Being Supervision Service (decree of the President of the Russian Federation No 649 of 20.05.04).

The Ministry of the Public Health and Social Development of the Russian Federation commands the activities of the Federal Medical and Biological Agency (decree of the

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" stipulates that the operating organization, i.e. the license holder, is fully responsible the safety of the nuclear installation as well as proper management of nuclear material and radioactive substances.

According to this law, the operating organization must have the authority, financial, material and other resources sufficient for performing its functions.

The operating organization is the organization established in accordance with the legislation of the Russian Federation and acknowledged capable of operating a nuclear installation and carrying out, on its own or with involvement of other organizations, siting, design, construction, operation and decommissioning of the nuclear installation, as well as management of nuclear materials and radioactive substances.
The operating organization must have a license for each of the said activities granted by the state safety regulatory body; the license must document the conditions to be met by the operating organization when it carries out works in the field of use of atomic energy.

The operating organization must ensure:

- the use of a nuclear installation solely for the purposes it has been designed for;
- the organization and coordination of development and implementation of quality assurance programs at all stages of development, operation and decommissioning of the nuclear installation;
- the development and implementation of measures to prevent accidents at the nuclear installations and mitigate their adverse consequences for the nuclear installation 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 population in the event of an accident at the nuclear installation;

- the control and accounting of nuclear materials and radioactive substances, security of the nuclear installation;
- the development and implementation of fire safety measures;
- the radiation monitoring in the controlled area and surveillance zone;
- the liability for nuclear damage.

A list of main organizations which manage spent nuclear fuel and radioactive waste and have the status of the operating organizations as per the directive of the Government of the Russian Federation No 2186-r of 09.12.2005 is given in Appendix F1.

The license holder is made fully responsible for:
- the nuclear and radiation safety;
- the development and implementation of measures to improve safety at the management of spent nuclear fuel and radioactive waste;
- the ensurance of radiological protection of the personnel, population and environment;
- the financial coverage of civil liability for nuclear damage.

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:*
>
> *i)* ***qualified staff are available*** *as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;*
>
> *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;*

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

> ***Article 22. Human and Financial Resources***
>
> *Each Contracting Party shall take the appropriate steps to ensure that:*
>
> *i)* ***qualified staff are available*** *as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;*

Regulatory Requirements

In accordance with requirements established by the federal laws, legislative and normative acts and regulatory documents, the operating organization which manages spent nuclear fuel and radioactive waste must provide for:

a) before the commissioning of the nuclear installation, an adequate number of employees of required competence and who are permitted in accordance with the established procedure, to work independently;

b) recruitment, training and maintaining of the required competence of the nuclear installation employees;

c) a system of recruitment and training of the employees, which is aimed at achieving, control and maintaining their competence as required for safe operation of the nuclear installation;

d) a system of permits to allow the employees of the required competence to perform permitted activities;

e) regular emergency drills to master the employees' actions in the event of operational events, including accidents, and accounting of lessons learned from previous accidents and errors;

f) building the employees' safety culture.

Licensing Requirements and Supervision

According to the Federal Law "On the Use of Atomic Energy", the license holder is made responsible for the proper management of SNF and RW.

According to the license conditions as regards the human resources, 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 the nuclear installation or permitted activity;
- to arrange for training, examination, re-training and advanced training of the employees;
- to obtain permits from the Rostechnadzor to perform works in accordance with the List of Positions of Nuclear Facility Personnel (the decree of the Government of the Russian Federation No 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 Rostechnadzor and Minzdrav);
- to obtain permits from the Rostechnadzor to perform certain works in the field of use of atomic energy by employees of radioactive waste storage facilities (specialized enterprises for RW management) and enterprises (institutions, organizations) which operate radiation sources (hereinafter – the enterprises) as per the List of Positions of Employees of RW Storage Facilities (Specialized Enterprises for RW Management) and Enterprises (Institutions, Organizations) which Operate

radiation sources (the order of the Gosatomnadzor of Russia No 12 of November 19, 2001, RD-07-14-2001).

In the Rostechnadzor Headquarters and regional offices there are commissions which review applications and grant permits to employees of the operating organizations to carry out works in the field of use of atomic energy.

The safety regulatory body has developed guides on supervision over how the required level of competence is maintained of the employees who operate a nuclear installation or storage facility (RD-04-28-97, RD-034-05 and other).

In the course of their inspections, Rostechnadzor'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.

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

Institutional System of Training, Advanced Training and Qualification

Rosatom is the federal body for control of 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 the Rosatom's activities. As of 01.01.2005, Rosatom had under its jurisdiction 4 higher education and 3 secondary education professional institutions funded from the Federal budget as well as 5 advanced training institutions.

The Rosatom's personnel are educated in 14 educational institutes reporting to the Rostekhobrazovanije.

Conferences, meetings, workshops and other events to discuss problem areas and exchange experience are one of the 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 jointly with the corresponding bodies for the control over the uses of atomic energy should raise a fund to cover expenditures arising from decommissioning of the nuclear installation 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 the decree of the Government of the Russian Federation No 367 of 02.04.1997.

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 No 576 of 21.09.05).

The documentary package for getting a Rostechnadzor license of the applicant must include documents which confirm that the funding sources for the work to justify and improve safety of the nuclear installation and storage facility and their decommissioning are available to the applicant.

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

The RF Government is involved in the process of loss or damage idemnification 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 level established for this operator.

In cases where the operating organization does not implement the entire cycle of the RW management, when obtaining the Rostechnadzor's license is must confirm that it has the financial coverage of possible transfer for the further reprocessing of the radioactive waste being generated or held on temporary storage.

Some measures of nuclear and radiation safety of SNF and RW management are foreseen in the FTP "Nuclear and Radiation Safety of Russia for 2000-2006" to be funded from the federal budget (the state customer-coordinator is Rosatom).

At present, the work is carried out to develop a system approach to solve problems associated with the management of RW which is the "nuclear legacy" of the former USSR. The nuclear legacy elimination problem is complex and multi-faceted and cannot be solved completely within the coming years due to economic and science and technology problems.

It is assumed that the financial support of the monitoring of the disposed RW after closure will be arranged for under the Federal Law "On the Management of Radioactive Waste".

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.*

When managing spent nuclear fuel and radioactive waste, 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 the regulatory document "The Requirements for the Quality Ensurance Program of Nuclear Fuel Cycle Facilities" (NP-041-02, NP-011-99, RB-003-98) developed on the basis of the Federal Law "On the Use of Atomic Energy", federal norms and rules in the field of use of atomic energy with consideration of recommendations of the IAEA and provisions of the international ISO standards.

The availability of the quality assurance program and its implementation plan are the compulsory requirements for the conditions of license validity.

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.

The three basic principles of radiation safety and their implementation mechanisms are stipulated in the legislation:

- 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 internationally acknowledged radiation safety principles are reflected in the Russian legislation, in the first hand, in the following documents:

- Federal Law "On the Radiation Safety of the Public";
- Radiation Safety Standards NRB-99;
- General Safety Provisions for Nuclear Fuel Cycle Sites, NP-016-05.

The law "On the Radiation Safety of the Public" takes account of the International Commission on Radiation protection (ICRP Publication 60, 1990) and establishes the following dose limits for exposure to IRS and, thus, for SNF and RW management:

- 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;
- 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 persimmissible at certain years to have higher values of the effective dose (less than 0,005 Sv) provided the average annual effective dose calculated over five sequential years will not exceed 0.001 Sv.

The NRB-99 describes in detail the requirements of the law and establishes standards for ionizing radiation impacts, including:

- irradiation of the personnel and population in normal operation conditions of the installation or other man-made IRS;
- irradiation of the personnel accidents and intervention levels for the population protection in case of a radiation accident;
- irradiation of employees of industrial enterprises and population by naturally occurring IRS;
- medical irradiation of the population.

The OSPORB-99 establishes the requirements for protection of humans against adverse radiation impacts in all conditions of exposure to IRS covered by NRB-99.

In the Russian Federation a system of standards and rules has been created, which when observed provide for the achievement of the radiation safety goals: acceptable limitation of the personnel and public exposure levels at all stages of SNF and RW management.

The safety in the course of SNF and RW management is ensured through implementation of a number of principles and measures stipulated in the legislative and regulatory bases:

- principles of the justification, optimization and dose limitation;
- continuous monitoring;
- implementation of the defense-in-depth principle which assumes the establishing a number of subsequent levels of protection from potential failures of the equipment and human errors, including:
  - the setting up of subsequent physical barriers on the path of propagation of IR, NM, RS to the environment;
  - implementation of technical and administrative measures to maintain integrity and efficiency of these barriers;

  - planning of measures to protect the public and environment in case the barriers are destroyed;
- comprehensive justification and testing of technical and organizational solutions, their compliance with the norms and rules adopted for the nuclear industry;
- development and implementation of the quality assurance program for all stages of SNF and RW management;
- development and implementation of the quality assurance program for all stages of SNF and RW management;
- implementation of engineered features and organizational measures aimed at prevention of violation of safe operation limits and conditions;
- control, accounting and physical protection of SNF and RW to ensure their security.

Beginning from the stage of design through the decommissioning, the SNF and RW management facilities' life cycle is accompanied with the continuous activities aimed at solving safety ensurance tasks, with each stage featuring its specific set of such tasks.

The categorization of facilities by their potential radiation hazard is set forth by the regulation OSPORB-99 (Appendix F2).

Depending on the facility hazard category, the regulatory documents establish special requirements for conditions of its siting, design; setting size of its controlled areas and surveillance zone; organization of work; radiation safety systems for the personnel and population both for normal operation and emergencies.

In order to protect the public in the area of the facility's location, special territories are created, such as the buffer area and the radiation-control zone.

Radiation monitoring should be performed in these zones. The size and the borders of the buffer area are defined by the buffer area project in compliance with the norms and rules in the field of the use of atomic energy. The project should be agreed with state sanitary-epidemiological authorities and approved by the local government.

The legislation defines the legal regime for the buffer area. On its territory, it is prohibited to perform any residential or public construction or that of children-care facilities, as well as non-relevant construction of health-care enterprises, catering establishments, industrial facilities, auxiliary or other structures and facilities that are not envisaged by the buffer area project approved.

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 the protection of the personnel and population in case of accidents at facilities is subject to a federal laws, regulatory documents and state standards. These documents have been developed considering the Russian and international experience and take account of recommendations of the following IAEA safety guides:

- Preparedness of Public Authorities for Emergencies at Nuclear Power Plants, Safety Guide No 50-SG-G6, Vienna, 1982;
- Preparedness of the Operating Organization (Licensee) for Emergencies at Nuclear Power Plants, Safety Guide No 50-SG-06, Vienna, 1982.

The following has been defined by the above mentioned documents:

- Norms of protection of the citizens of the Russian Federation and foreign citizens, as well as the environment, against natural and man-induced emergences;
- Principles of organization, force and capabilities, and interfaces of players during the elimination of emergencies if occur to the installations;
- Tasks and functions of the Interagency Emergency Aid Group.

The Russian Federation has set up and operates the Unified State System of the Prevention and Elimination of Emergencies, which covers the entire territory of Russia; in terms of work organization and operations the system is controlled by the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters.

It includes the functional subsystem of Rosatom that is the industry-wide system for prevention and elimination of emergencies at facilities pertaining to nuclear industry.

The above said industry-wide system includes six functional ETC which cover their designated areas of responsibility; the ETC support preparedness for elimination of radiation accident consequences during SNF and RW transportation.

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.

According to the Russian legislative and regulatory basis the decommissioning is subject to review and control at all stages of the installation life cycle.

The NI or the storage facility under decommissioning should be serviced by quialified personnel with an access to independent work in the established order.

The NI or storage facility decommissioning project must be developed in advance, i.e. before the end of their service:

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

The safety analysis report of the installation decommissioning is a mandatory document to be submitted with the application to get the license. The decommissioning measures and technical solutions of the installation must comply with requirements of the existing regulatory basis, IAEA recommendations; and their implementation must maintain the permissible impact on personnel, the public and the environment.

Prior to the NI or the storage facility decommissioning, the operator should prepare the activities plans to protect personnel and the public in emergencies.

During the NI or the storage facility functioning, the operator should keep the information essential for decommissioning, including the project and operational documentation.

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 legislative and regulatory basis of the Russian Federation provides for the measures to be taken at all stages of spent nuclear fuel management to proper protect the personnel, population and environment against the radiation impact associated with the above management.

A complete list of regulatory documents is given in Appendix E.

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 safe use of atomic energy envisage a comprehensive set of measures to ensure nuclear and radiation safety during the SNF management and removal of residual heat resulting from the SNF management,

including stages of: on-site storage, transportation and reprocessing at the SNF recovery plants.

According to the Russian normative and regulatory basis, during the management of spent nuclear fuel the effective neutron multiplication factor must be maintained as low as practicably acceptable and should not exceed 0.95 during normal operation.

In case of any single failure K_{eff} should not exceed 0.98.

During the design, construction and operation of installations and devices used in the SNF management, mandatory requirements for the process and design solutions should be established and aimed at ruling out the SCR (the limits for nuclear material parameters, the equipment, placement of NM equipment/packaging, etc.) and breach of safety barriers.

Measures for removal of residual heat (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.

During the design, construction and operation of installations and devices used in the SNF management the 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.
The list includes representative scenarios of accidents featuring severe consequences needed to identify a plan of possible response actions. When compiling a list of beyond design basis accidents, their realistic analysis (non-conservative) is carried out; the analysis contain assessment of probabilities of sequence of each specific beyond design basis accident that leads to severe damages to the protective barriers.

The analysis of beyond design basis accidents given in the design is the basis for drawing out measures to protect the personnel and population in the event of an accident.

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;*

One of the key safety ensurance measures is the solving of issues related to minimizing the generation of radioactive waste at all stages of management of spent nuclear fuel and its secure isolation from humans and biosphere during the entire period of their potential danger. The work is underway to develop new methods of SNF reprocessing which could substantially reduce the waste quantity at the expense of exclusion of the extraction techniques from the process.

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;*

At present, two options of spent fuel management are implemented:

- spent fuel of units with WWER-440 and BN-600 reactors and spent fuel of research reactors is kept in interim storage facilities in the at-reactor hold-up ponds and then it is shipped to a reprocessing facility;
- spent fuel of units with WWER-1000, RBMK-1000, EGP-6 and AMB reactors, spent fuel of research reactors which is not subject to reprocessing is kept under controlled storage in on-site (at-reactor) special storage facilities or in the centralized storage facility.

The system of regulation of the design, construction, operation, maintenance and repair, inspection and testing of spent fuel management facilities, as well as accounting and review of their operational events existing in Russia, allows for continuous ensuring of safety of management of spent nuclear fuel at all stages. All the above kinds of activity as well as the SNF transportation from the reactor sites to the PA Mayak or the MCC is within the competence of safety regulation authorities.

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;*

According to the Russian legislation, the operating organization should apply to get a construction permit and an operating license for the of spent fuel management facilities, with a thorough analysis of its safety submitted along with the application. The analysis contains a detailed description of the location and technical characteristics of the facility working conditions, assessments of radioactive releases, projected radiological impact to the population and environment, models used to assess impacts and measures to bring the enterprise in compliance with the regulatory requirements.

The issue of whether the impact to the environment is permissible is solved in the course of the state environmental review.

The regulatory bodies review the submitted safety analysis of the enterprise and grant a permit or license. If necessary, the authorized bodies may grant a license which will restrain the enterprise functioning by certain special conditions.

Subsequently, when the enterprise starts operating its operation must comply with the regulatory requirements and its administration must carry out the monitoring to ensure that the enterprise operates within the set limits. Local or competent authorities also implement an independent monitoring program.

The compliance with requirements of the legislative and regulatory basis developed in the Russian Federation ensures fulfillment of the environmental safety requirements; with that, it is assumed that the environmental monitoring standards required to ensure the radiation protection of man at the state-of-the-art level guarantee that representatives of other species are also not exposed to risk. These requirements are based on the Defense-in-Depth Concept which is implemented at all stages of SNF management (described in detail in Sections E and F).

The enterprises involved in the SNF management have started implementing the international environmental standards considering the international recommendations and tat of the "Basics of the Environmental Policy of Rosatom".

For projects dealing with importation of SFAs to the Russian Federation for storage and reprocessing the uniform project implementing procedures are envisaged to reduce general risk at the expense of implementation of special environmental programs.

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;*

In the course of the design, construction and operation of installations and devices used for SNF management all adverse factors are taken into account and risk of their impact is analyzed. The risk analysis is carried out for both normal operation and accidents. The accounting of risks that may be associated with spent fuel management is a compulsory condition for granting a license and its validity.

The design of NI and storage facility safety important systems must account for mechanical, heat, chemical and other impacts arising from design basis accidents (NP-016-05).

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).

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.

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.*

According to the national policy, the SNF management combines storage and reprocessing.

The storage is implemented:

- in at-reactor and on-site storage facilities of NPPs and RRs (main data of SNF NPP storage facilities are given in Appendix G);
- in pool-type storage facilities at two Rosatom's combines (MCC and PA Mayak);
- on nuclear icebreaker maintenance ships (SNF of nuclear-propulsion reactors).

The SNF of power reactors WWER-440 located in Russia and those built to the Russian designs abroad as well as BN-350 and BN-600 reactors, icebreaker nuclear-propulsion reactors and RR is reprocessed at RT-1 of FSUE PA Mayak.

The safety of SNF management installations 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 design, construction operation, maintenance and repair, inspection and testing of SNF management installations, as well as that of review of their operational events allows to continuously ensure safety in the course of the SNF management at all stages.

All NFC enterprise which operate SNF management installation should annually submit reports in accordance with provisions of the "Requirements for Annual Report on Nuclear and Radiation Safety of NFC Enterprises" (RD 05-11-95).

Spent Fuel of Nuclear Power Plants

As of 01.01.2006, Russia operates 31 units with a total capacity of 23242 MW. In the SNF on-site storage facilities there are 12350 tons of SNF, including 10288 tons of RBMK fuel.

The spent fuel of RBMK and EGP reactors is kept in the on-site storage facilities.

The spent fuel of WWER-1000 reactors is stored in the at-reactor hold-up pools and after three-year hold-up is shipped to the centralized wet storage at FSUE MCC.

The spent fuel of WWER-440 and BN-600 reactors is shipped to FSUE PA Mayak.

The spent fuel of the shutdown AMB reactors of Beloyarsk NPP is stored on-site (5000 SFAs) and FSUE PA Mayak (2200 SFAs).

Table B.1.1 of Appendix B1 presents data on the quantity and locations of SNF of different reactor types, as of 01.01.2006. The main bulk of SNF is located at FSUE PA Mayak and FSUE MCC.
The currently used SNF wet (under water) storage technology is the necessary initial step of SNF management since it provides for an effective cooling of FAs.

An important issue which is subject to active studies is the determining of limiting time of the wet storage considering the SNF conditions. For example, material corrosion processes occur in water to produce radioactive waste if the wet storage is used for a long period of time.
The transition to the dry storage method is envisioned where corrosion of spent fuel and structural materials will be insignificant and the quantity of resulting waste will substantially decrease. The work is underway to determine optimal modes of dry storage of SNF (up to 50 years).
During the storage period and after it ends there should be a possibility to retrieve SNF for inspection, reprocessing (or preparing for deep geological isolation).

Spent Fuel of Research Reactors

A part of RR fuel was reprocessed at RT-1. Some SNF has not been reprocessed. This fuel has accumulated in temporary storage facilities of the research centers; in many cases these storages are nearly full, by now. About 90 tons of SNF are under the controlled storage.

Because of a great variety of spent nuclear fuel designs, difference in fuel composition and structural materials the work is underway to select a reprocessing or long-term storage technology for SNF.

The existing aqueous extraction technology is used to reprocess fuel of IRT-1000, IRT-2M, IRT-3M, WWR-(S, M, M2, M3, M5, M7) and MR reactors. This is the fuel made of

the ceramic UO_2 composition in cladding made of zirconium alloy E-110 and the fuel made of dispersed fuel compositions $UA1_3$ - Al, UO_2 - A1 with different enrichment with uranium-235 placed in aluminum alloy cladding.

It is assumed that the long-term storage followed by ultimate disposal technology will be used for the currently non-reprocessible spent fuel of research reactors SM-2, SM-3, which is made of the dispersed composition of uranium dioxide incased in the copper-magnesium matrix and EI-847 cladding.

The reprocessing technology that uses pyroelectrochemical technique followed by reuse of recovered uranium and plutonium is tested for the spent fuel made of ceramic compositions in different steel cladding (EI-172, EI-847, ChS-68 etc.) of experimental research reactors BOR-60, BR-10, IBR.

Spent Nuclear Fuel Management at FSUE PA Mayak

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

The RT-1 main tasks are receipt, temporary storage and reprocessing of different types of SFAs: power reactors of WWER-440 and BN types, research reactors and NPI of Nuclear Icebreaker Fleet.

The SNF reprocessing is carried out in accordance with conditions of the license granted by Rostechnadzor (Gosatomnadzor) of Russia No GN-03-115-1241 issued February 27, 2004 giving the FSUE PA Mayak the right to operate the RT-1 radiochemical plant.

The SNF reprocessing flow diagram of RT-1 is very close to the traditional option of the PUREX-process.

By nature of performed functions the safety systems and components involved in spent fuel reprocessing at FSUE PA Mayak are divided into:

- confining;
- supporting;
- controlling.

These systems protect the plant personnel, population and environment from the radiation impact resulting from the spent fuel management.

Confining Safety Systems

The RT-1 plant includes confining safety systems (physical barriers) intended to confine RS and ionizing radiation within the design boundaries of RT-1 sections and prevent their release into the environment in case of an accident.
In normal operation the confining systems prevent propagation of RS within the working premises and, thus, prevent contamination of working places and overexposure of the personnel. One of the main requirements for the confining safety systems is the isolation of radioactive substances within the installations where nuclear materials and radioactive substances are handled. To meet this requirement the plant's

process systems and components containing nuclear materials, radioactive substances and radioactive waste are emplaced in leak tight premises (enclosures, chambers, boxes).

To limit release of radionuclides to the working premises and environment the confining safety system includes the systems of static (equipment, room walls and overlappings, shielding) and dynamic (ventilation systems, gas clean-up equipment) barriers.

Supporting Safety Systems

The supporting safety systems of the plant are designed to supply the safety system with power, working medium and to create conditions for their functioning.

Controlling Safety Systems

At present, in particular, two information and control systems (MAIS-T (process control) and MAIS-D (dosimetry)) have been developed and implemented by the plant.

The controlling safety systems are designed to perform the following:

- measurement of process parameters (MAIS-T system);
- measurement of the exposure dose rate (EDR) of gamma-radiation and radionuclide releases to the environment (MAIS-D system);
- processing of the incoming information;
- warning on deviations from the pre-set values;
- display of operative and archived data on process parameters and radiation situation in buildings, rooms and atmospheric releases.

The radiation safety is ensured through strict compliance with the process norms stipulated in the corresponding process regulation sections.

According to the "Basic Sanitary Rules of Radiation Safety" (OSPORB-99), all operations carried out in the plant's premises are attributed to class I operations.

In the plant buildings there are engineered features to ensure radiation safety in compliance with the requirements for the class I productions:

- sufficient biological shielding;
- remote process control;
- leak tight hardware;
- forced ventilation with required air changes per hour;
- clean-up of process and ventilation air before its release to the atmosphere;
- safe evacuation of liquid and solid radioactive waste.

The following organizational and technical measures are implemented:

- conduct of repairs under work permits;
- training of the personnel in safe working practices in accordance with the plant-wide "Main Provisions for Work with the Personnel of the Plant Structural Units";
- medical examinations and psycho-physiological checks, as per the order of Minzdrav of Russia No 105 of 09.04.1997 "On the Procedure for Medical Examinations and Psycho-Physiological Checks of Nuclear Facility Employees";

- radiation monitoring at all stages of the spent fuel reprocessing as per the "Radiation Monitoring Procedure" approved in accordance with the established procedure.

Actions in case of abnormal situations (operational events, accidents etc.) are set forth in the "Emergency Procedure for the Personnel" reg. No 14245 and "Personnel Actions in the Event of Self-Sustained Chain Reaction" reg. No 13772, developed and approved in accordance with the established procedure.
The radiation safety monitoring during the SNF reprocessing and management of solid radioactive waste is carried out in accordance with the "Radiation Monitoring Procedure" reg. No 14116.

The RT-1 personnel's effective exposure doses are those from exposure to external gamma- and neutron radiation and internal irradiation due to intake of plutonium. A contribution of beta-radiation to the effective dose is insignificant and is less than 0.01 mSv per year. The personnel effective exposure doses are less than regulated values.
In 2001-2005 radioactive substance releases were 6.6 up to 9.77 mCi/year for the total activity of alpha-emitting radionuclides and 59.6 up to 104 mCi/year for the total activity beta-emitting radionuclides.

Releases are at the level of average annual values. Over 5 recent years there have been no records of excedence of reference levels, moreover the permissible limiting levels, of radioactive substance releases in the territory of RT-1.
At present, the current releases of radionuclides to the atmosphere from all existing sources of the enterprise do not produce a practical impact to the radiation situation in the FSUE PA Mayak's region.
The fallout reference levels are set forth in the "Radioactive Fallout Reference Levels at the Industrial Area of FSUE PA Mayak for 2002-2005".

The radiation situation at the industrial area of the enterprise formed in 1950-1960. At present, it is characterized by a high degree of stability and clear trend to reduction of radioactive contamination parameters.

The radiation monitoring at FSUE PA Mayak is carried out by the Physical Analysis Method Laboratory of the Plant Central Laboratory. This laboratory has been qualified in accordance with the established procedure and granted the Accreditation Certificate issued by the Gosstandard of Russia acknowledging it as a radiation monitoring laboratory; the State Registry Number 41254(42)-04. The Certificate is valid until 01.04.2007.

The rehabilitation of the population and territories is underway. This activity also includes the works being executed in frames of federal targeted programs and other projects related to radiation safety ensurance in the region.

Spent Fuel Management at FSUE MCC

At FSUE MCC the spent fuel of WWER-1000 reactors is stored in the wet storage facility commissioned in 1986. The storage facility is operated in accordance with conditions of the license issued by Rostechnadzor (Gosatomnadzor) of Russia No GN-03-301-0724 of 25.12.2005 granted to FSUE MCC for the operation of the stationary structure intended for storage of nuclear materials – storage facility for FAs with SNF of WWER-1000 reactors.

The storage facility design capacity is 6000 tons of uranium. The work is underway to expand capacity up to 8600 tons.

The storage facility includes: receipt section, storage section, common transfer hall and process support section.

The reliability of the spent fuel management system of the storage facility of FSUE MCC is ensured through quality of design and manufacturing as well as reliability of the equipment, in-service monitoring of its condition, organization and implementation of work in compliance with the operating documentation requirements.

A feature of the system for storage and management of spent nuclear fuel at all storage facilities, as stipulated in the Russian legislative and regulatory documents, is the independence of subsystems from each other. It means that a failure of one subsystem does not lead to a failure of another subsystem or system as a whole. A failure of any subsystem may lead only to a delay in performing functions by one or several subsystems for the period of time required for repair.

The radioecological monitoring is an important constituent of the environmental safety during transportation and storage of spent fuel.

The Radioecoligic Monitoring Laboratory (REML) of the MCC Reactor Plant monitors:

- atmospheric releases of radionuclides and harmful chemical substances (HCS);
- content of radionuclides in the bottom layer of the atmosphere;
- content of radionuclides in the atmospheric precipitations;
- content of radionuclides in ground and subsoil water;
- content of radionuclides in soil and vegetation;
- content of radionuclides and HCS in discharged water;
- content of radionuclides and HCS in water of the Yenisei River and creeks;
- content of radionuclides in the bottom sediments, aqueous vegetation and fish;
- content of radionuclides in foodstuff;
- radiation situation in the field.

The monitoring results for all monitored parameters are presented in annual reports "On the Radioecological Situation in the MCC Location Region".

In 2005 the content of radionuclides in the air of the industrial site within the CA boundaries and nearby settlements was substantially below the permissible levels set up by NRB-99.

In addition to the routine procedures of assessment of compliance with norms and rules, the enterprise analyzed safety of the storage facility for WWER-1000 spent fuel; the analysis was carried out with involvement of the European Community and Russian

experts (TACIS Project R-01/94). A categorization of off-normal situations and accidents relevant for the storage facility was compiled. The probabilistic safety analysis was done for potential accident sequences.

At present, some 4300 tons of spent fuel is under controlled storage at FSUE MCC.

The radiological monitoring has demonstrated no effects of SNF storage facilities on the environment.

The operative information about gamma-radiation levels can be obtained through the Automated Radiation Monitoring System (ARMS) built at FSUE MCC; this information is available at http://askro.atomlink.ru.

The construction of the dry storage facility for WWER-1000 and RBMK spent nuclear fuel is carried out in full compliance with the license available to FSUE MCC.

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 is subject to licensing and is strictly regulated by Russian legal normative basis (E.2.2.)

As the facilities for spent fuel management are categorized as the sources of increased danger and their operation poses hazard to the public health and life and is an environmental hazard, Russian legislation takes into consideration special requirements pertaining to the siting of these facilities.

In the first place this is the Resolution of the Government of RF of March 14, 1997 "On the rules of taking decisions on siting and construction of nuclear facilities, radiation sources and storage facilities".

The basic criteria and the requirements to safety provisions and to the siting regions and the sites of the facilities for the spent fuel management are determined by the following normative document:

"Siting of nuclear fuel cycle nuclear facilities. Basic criteria and the requirement to safety assurance" (NP-050-03).

In these documents the requirements of the following international documents are taken into consideration:

- 50-C-S (Rev.1) Code on the Safety of Nuclear Power Plants: Siting. IAEA, Vienna,1990;
- 50-SG-S1. Earthquakes and Associated Topics in Relation to Nuclear Power Plant Siting. IAEA, Vienna, 1994.

The siting decision is taken with the consideration for:

- the need for the facility for the economics of the Russian Federation on the whole and its individual regions;
- the availability of the conditions to site the above facilities, which should comply to the norms and rules in the area of uses of atomic energy;
- the lack of hazard to the security of a nuclear installation, a source of radiation or a storage facility from nearby civil or military facilities;
- possible social and economic consequences of siting of the above facilities of the use of atomic energy for the industrial, agricultural, social and cultural development of the region.

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 Rosteckhnadzor (the Decree of the Government of the Russian Federation of 19.01.2006 No. 20).

The documents on the assessment of radiation impact on the environment together with other project documents are reviewed without fail by the state ecological expertise with the consideration for the conclusions of the public commissions of experts.

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 by put forward by the state authorities, by the local government and public organizations (associations).

Disposition, design, construction of spent fuel management facilities is prohibited in the territories with high population concentration, health resorts, recreation and sanitary zones and sanitary protection areas, as well as in seismic zones and the locations of traditional public recreation and medical treatment.

In siting of the new SNF management facilities the Russian Federation will issue from the terms and conditions of point 2 article 6 of the Convention.

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).

In compliance with safety requirements the installation for RW management should be designed and built in such a way, that its radiation impact on the personnel, the public and the environment in normal operation, in violations of normal operation, including design basis accidents, should not result in exceeding normative levels of irradiation 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-016-05) determine that organizational and technical measures for the design and construction of SNF management facility should be performed with the consideration for its future decommissioning (closure).

Technical and organizational approaches used to assure safety of SNF management facilities should be justified by the previous experience or by tests, researches, experience of operation of prototypes. This approach should be 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 by put forward by the state authorities, by the local government and public organizations (associations).

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 Article 11 of the Federal Law "On the Environmental Review", the following is subject to the mandatory state review:

- feasibility studies and projects of the construction, renovation, expansion, retrofitting, mothballing and elimination of SNF management facilities;
- justification documentation of licenses for activities (for example, operation of a SNF management installation), which may impact the environment.

The statement of the state environmental review must be submitted to Rostechnadzor within a package of justification documents for the license to construct or operate a SNF management installations.

To obtain the license for construction or operation of a SNF management installation the operating organization develops and submits to the regulatory body a SAR which should describe a system of technical and organizational measures to ensure safety of the SNF management installation. The SAR should include safety analysis results of the SNF management installation, including a list of initiating events of design basis accidents and a list of beyond design basis accidents, results of the deterministic and probabilistic safety analyses of the SNF management installation.

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 licence 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.

All organizations, operating spent fuel management facilities are licensed for operation by Rostechnadzor.

Issuing operational licenses is performed by Rostechnadzor only after receiving the positive conclusion of ecologic expertise and safety expertise of implementing the program of commissioning of the facility and executing inspections to check the readiness of the operating organization to safe operation of the facility.

The inspection in the process of the review of the materials for issuing the license is performed with the objective to:

- assess the issues of assuring safety directly at the facility;
- check on the site the authenticity of the presented information;
- assess the capability of the license applicant and the availability of conditions for the operating organization to perform the declared activity.

Presently Rostechnadzor grants licenses with the period of validity of 5 years, as a rule. The same periodicity is used by Rostechnadzor to perform the safety assessment of the facility which envisages confirmation or review of the operational limits and conditions with the consideration for the operational experience and the status of scientific and technical support.

In compliance with the requirements of the Federal Law "On the use of atomic energy" the operating organization permanently performs the control of the safe operation of a nuclear facility at all stages of its life cycle.

The system of control and inspections performed by the operating organization is aimed at early identification and prevention of deficiencies in the operation of the facility and timely elimination thereof.

Periodically, in accordance with the requirements of normative documents, the functioning of safety and safety important systems of the facility is checked.

The operating organization performs comprehensive and specific inspections of safe operation of the facilities, as well as the checks of the compliance with the conditions of the licenses granted by Rostechnadzor.

The operating organization also performs permanent control and inspections of the condition of the equipment by means of technical examining of the equipment.

The information on the results of control and inspection activities of the operating organization is drawn up as reports.

All activities pertaining to the prevention and elimination of incidents in the area of spent fuel management are performed within the frames of the Uniform system of prevention and elimination of emergencies, established in the Russian Federation.

After achieving the design life of the installation, the operating organization should justify the availability of residual life of the installation.

The operating organization provides the development of decommissioning plans with the consideration for the performed upgrades and consequences of incidents which took place.

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 the disposal of spent fuel in the Russian Federation is not envisaged.

Section H. Safety of radioactive waste management (Articles 11 – 17)

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.

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.

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.

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.

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).

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.

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 goals of assuring safety in RW management are:

- to assure reliable protection of personnel and public against radiation impact of RW above the levels set by radiation safety norms;

- to assure reliable isolation of RW from the environment, , protection of the present and future generations, biological resources from radiation impact above the levels set by radiation safety norms;
- prevention of releases (discharges) in RW management into the environment in the amounts exceeding maximum allowed releases (discharges).

The basic principles of assuring safety in RW management are similar to the principles of assuring safety in SNF management (Sections G.1 - G.7):

- the principle of protection of human health – assuring acceptable level of protection of the personnel and the public from radiation impact of RW in compliance with the principle of justification, normalization and optimization;
- the principle of protection of the environment – assuring acceptable level of protection of the environment from radiation impact of RW;
- the principle of interrelation of RW generation stages and management stages – taking into account the interconnection of stages of RW formation and RW management;
- the principle of protection of future generations – the predictable levels of irradiation of future generations, caused by RW disposal, should not exceed the allowable public irradiation levels, set by the normative documents in effect;
- the principle of avoiding imposing undue burden on future generations - avoiding imposing undue burden on future generations related to the necessity of assuring safety in RW management;
- the principle of control of generation and accumulation of RW – RW generation and accumulation should be restricted at minimum practically achievable level (the positive trend of the last few years should be pointed out – RW reprocessing amounts in the Russian Federation exceed the amounts of RW newly generated, for example, in 2004 the total activity of RW reprocessed is equal to 4.68 *10 ^{18} Bq while total activity of generated RW is equal to 3.91*10^{18} Bq;
- prevention of accidents with radiological consequences and mitigation of consequences, if any.

The issues of safety of RW management in the Russian Federation are regulated by federal laws, federal branch-of-industry norms and rules, sanitary rules.

The fundamental document is the Federal Law "On the use of atomic energy" of 21.11.1995 № 170-FZ. The Article 48 of this law reads: "In storage or in disposal of radioactive waste there should be provided their reliable isolation from the environment, the protection of the present and future generations, of biological resources against the radiation impact above the limits set forth by the norms and the rules in the area of uses of atomic energy. Storage or disposal of radioactive waste should be envisaged by the project or technical documentation as an obligatory stage of any cycle of nuclear technology".

The requirements to the collection, reprocessing, storage and conditioning of solid and liquid radioactive waste at nuclear facilities, radiation sources, in the facilities for storage of nuclear material and radioactive substances, RW storage facilities are set by the federal norms and the rules in the area of uses of atomic energy (NP-020-2000, NP-019-2000 and SPORO-2002).

The above mentioned documents cover nuclear facilities in design, construction, operation and in decommissioning.

In accordance with the above mentioned documents, the technical means and organizational measures to assure radiation safety in collection, reprocessing, storage and conditioning of RW at nuclear facilities should be determined basing on maximum allowed RW activity at these facilities and should limit the radiation impact on the personnel, public and the environment by the levels set by Radiation safety norms (NRB-99), federal norms and rules in the area of uses of atomic energy and other normative documents.

The projects of nuclear facilities should envisage concrete technical means for safe RW collecting, reprocessing, storage and conditioning.

General principles, criteria and the basic safety requirements in relation to RW disposal are set NP-055-4 and NP-058-04.

The first document, *inter alia*, declares different methods of RW disposal (final isolation) – subsurface, geological. Available RW storage facilities are the facilities for interim, provisional or long-term storage.

The second document determines common goals and principles of assuring safety in all stages of RW management within the frames of fulfilling commitments under the Convention.

All nuclear facilities, including RW management facilities, without fail have to pass ecological review in compliance with the requirements of the Federal Law "On ecological review" of 23.11.1995 № 174-FZ. Ecological review is based on the following basic principles:

- presumption of potential ecological hazard of any planned business or any other activity;
- obligatoriness of performing state ecological review prior to making a decision on implementation of the object of ecological review (the majority of presently operating Russian nuclear facilities were commissioned before 1995, due to this ecological review of these facilities was not been performed);
- comprehensive assessment of the environmental impact of business or any other activity and its consequences;
- authenticity and completeness of the information, submitted to ecological review;
- independence of ecological review experts in performing of their powers in the area of ecological review;
- scientific soundness, objectiveness and lawfulness of the conclusions of the ecological review;
- publicity, participation of public organizations (associations), accounting for public opinion;

- responsibility of ecological review participants and interested persons in organization, performance and quality of ecological review.

The establishment of the unified state system for SNF and RW management, the necessity of which was formulated in the Principles of the state policy in the area of assuring nuclear and radiation safety of the Russian Federation for the period of up to 2010 and further prospective would allow to enhance the management of radioactive waste at all stages of the life cycle.

Presently the production technologies and installations for conditioning of the main kinds and categories of RW are developed (Annex B1).

However, it is necessary to develop technical approaches to reprocessing and conditioning of some kinds of RW, which are practically absent presently (in particular, heterogeneous liquid RW, liquid and solid RW of medium level of activity).

The draft "Doctrine of radioactive waste management in the Russian Federation" is developed, and the federal draft law "On radioactive waste management " is under development. These draft laws will allow to enhance safety in RW management.

Section I. Transboundary movement

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 licence 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.

Import of spent fuel to the enterprises of the Russian Federation is performed in compliance with the international legal norms and Russian legislative basis, in particular the following legislative document are applicable:

- "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 January 14, 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 May 19, 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 December 22, 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 September 23, 1993;
- Safety Rules in Transportation of Radioactive Material, NP-053-04;
- Basic Sanitary Rules to assure Radiation Safety, OSPORB-99;
- Radiation Safety Norms, NRB-99, etc.

Normative document NP-053-04 was developed with the consideration for the IAEA recommendations presented in the document "Regulations for the Safe Transport of Radioactive Material", 1996 Edition, № ST-1, IAEA, 1996. This document takes into account the corrections and amendments made by the IAEA in the document "Regulations for the Safe Transport of Radioactive Material", 1996 Edition (Revised), № TS-R-1 (ST-1 Revised), IAEA, 2000.

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 spent fuel from foreign countries to the Russian Federation for interim technological storage and (or) reprocessing is the availability of the positive conclusion of the state ecological review of the relevant unified project.

Unified project - means the documents prepared in relation to the expected signing of 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 implemented requirements, including the following documents:

- draft foreign trade contract;
- special ecologic program (s) the implementation of which is performed at the cost of the funds, resulting from the foreign trade operations with irradiated fuel assemblies;
- documents justifying total reduction of risk of radiation impact and enhancement of ecologic safety level as the 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, envisaged by the foreign trade contract.

In compliance with the contracts in effect, spent fuel is imported from Ukraine and Bulgaria, while the importing of the spent fuel from the research reactor of the Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan with the transit through the territory of the Republic of Kazakhstan is completed.

The contracts envisage the return of the solidified radioactive waste resulting from the reprocessing and storage of the spent fuel to Ukraine, the Republic of Bulgaria and the Republic of Uzbekistan.

Transportation of packages with spent fuel from Ukrainian nuclear power plants is performed by rail by through train.

Transportation of packages with spent fuel from Kozloduy NPP (Bulgaria) is performed by water transport and by rail as this NPP is located on the Danube and has no local railway. 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 railway is performed in river ports of Reni (Republic of Moldova) and Izmail (Ukraine).

Transportation through the territory of Russia is performed exclusively by rail irrespective of the route. In doing this:

- certified packagings are used, and the justification of the design of the packages to the requirements of the rules for safe transport 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 transportation thereof are given in different calculations, explanatory notes, reports and conclusions;
- special railcars and special vessels for transportation of packages are used;
- the transportation is organized by special trains under special conditions of transportation;
- permanent control of transportation is performed.

All transportations are performed in full compliance with the international legal norms as well as the national legislation of Bulgaria, Ukraine and Russia as well as those of Uzbekistan and Kazakhstan only in case the permissions of the relevant competent authorities of these states are available.

In safety justification of spent fuel management a number of departmental normative documents are considered, such as:

- Spent fuel assemblies of nuclear research reactors, OST 95 10297-95;
- Spent fuel assemblies from nuclear power reactors VVER-440 and VVER-1000 of nuclear power plants of Ukraine. Technical specifications for the supply to regeneration plants of Russia, OST 95 10297-95;
- Spent fuel assemblies of VVER-type nuclear power reactors, General requirements for the supply to regeneration plants, OST 95 745-95;
- Spent fuel assemblies from nuclear power reactors VVER-440 and VVER-1000 of nuclear power plant "Kozloduy". Technical specifications 2615-TU.

Transportation of spent nuclear fuel of nuclear power plants with VVER-440 reactors to FSUE "PA Mayak" is performed in transport packagings TUK-6 on the basis of the

presently effective certificate-permission RU/042/B(M)F-85T(Rev. 5) in accordance with the procedure determined by Rostechnadzor license for the management of nuclear material in transportation № GN-05-401-1412 of 01.05.2005.

Transportation of spent nuclear fuel of nuclear power plants with VVER-1000 reactors to FSUE "MCC" is performed in transport packagings TUK -13/1V, TUK-10V and TUK-13V on the basis of the presently effective certificate-permission for the design and transportation of transportation packaging TUK -13/1V RU/052/B(U)F-96T, certificate-permission for the design and transportation of transportation packaging TUK -10/V RU/048/B(M)F-96T, certificate-permission for the design and transportation of transportation packaging TUK -13V RUS/046/B(U)F-96T in accordance with the procedure determined by Rostechnadzor license for the management of nuclear material in transportation № GN-05-401-1386 of 28.02.2005.

On May 27, 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. In compliance with the Agreement nuclear fuel of Russian origin, potentially suitable for nuclear weapons manufacturing, shall be returned to Russia. By 2010 it is envisaged to return to Russia and to reprocess spent nuclear fuel of all research reactors built in the former USSR republics and abroad. Presently the removal of spent fuel from the research reactor of the Academy of Sciences of the Republic of Uzbekistan is successfully completed.

During the period of 1995-2005 about 3000 tons of spent fuel were imported to the territory of the Russian Federation.

Section J. Disused sealed sources

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 RF legislation, the disused sealed ionizing radiation sources (SIRS) are categorized as RW, if their designed life has expired or they are acknowledged as defective.

The RW import to Russia is prohibited by the RF Law "On Environmental Protection".

On average 55,000 SIRS with an expired operation life are decommissioned per year in the Russian Federation.

The FSUE «PA «Mayak» facility, the main producer of category 1 or 2 SIRS, accepts the decommissioned SIRS of its own production from the RF users.
Other SIRS after their decommissioning are transferred in the established order to «Radon»'s specialized facilities for long-term storage.

Realizing the importance of observing item 27 of the Code of Conduct on the safety and Security of Radioactive Sources, Rosatom is in the process of preparing the proposals to the Government of the Russian Federation on repatriation of expired RS for reprocessing.

The legal basis for regulating the management of SIRS, including unused ones, are the Federal Laws of the Russian Federation in the area of use of atomic energy and protection of the environment, the Decree of the Government of the Russian Federation of 11.10.1997, №1298 «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», «The Regulation on state accounting and control of radioactive substances and radioactive waste in the Russian Federation», registered in the Ministry of Justice of the RF of 11.11.1999, №1976, normative technical documents, setting the requirements and rules in different areas of management of the sources, including the requirements to design, manufacture, storage, physical protection, transportation, life extension, disposal.

In compliance with decree of the RF Government No 1298, the management of the state system for accounting and control of radioactive substances and radioactive waste is performed by Rosatom.

The control of assuring safety for IRS management in the Russian Federation is performed by Rostechnadzor.
Rostechnadzor carries out licensing of the activity related to the use of the sources, and control of compliance with the requirements of the license, as well as the approval of normative-legal documents.

The control of timely return of SIRS with expired design life or disused ones for disposal is assured by the operating organization under control by the administration of the territories, Russian Federal Subjects, and by the Rostechnadzor.

The accounting for ionizing sources in the system starts from the moment of receiving the sources in the manufacturer's store of produced items (all relocations of the sources are subject to records) till the moment of disposal (re-categorizing into RW) and placing them into storage (disposal).

Presently the organizations have to keep to the procedure of notification on the relocation of the sources.

The information is submitted by both the supplier of the source (after shipping) and the customer (after receiving).

Transportation and storage (disposal) of disused SIRS is performed by specialized organizations, which have licenses issued by the Rostechnadzor for such activity while the requirements of the federal norms and rules in the field of use of atomic energy are observed.

Active work for the disposal of high-level SIRS, including RTG, is performed within the frames of international cooperation, including that with IAEA.

Section K. Planned activity in safety enhancement

For the purposes of implementing "Fundamentals of the state policy in the area of assuring nuclear and radiation safety of the Russian Federation for the period of up to 2010 and for further prospective" the Decree of the Government of the Russian Federation of 17.12.2005 № 2237-r approves the plan of measures associated with improving safety in SNF and RW management.

The safety enhancement plan for SNF and RW management envisages the following:

- to develop the draft federal law on radioactive waste management;
- to include amendments into the Criminal Code of the Russian Federation and the Code of the Russian Federation on Administrative Violations, pertaining to the liability for violating the law, norms and rules in the area of uses of atomic energy and the authorities of the bodies, which perform state regulation of safety in the use of atomic energy, to designate administrative punishments for the violations in the above mentioned area of activities;
- to include amendments into the Federal Law "On the Use of Atomic Energy", which should strengthen the role of the state regulating of safety in using atomic energy.

Section L. Annexes

Annex B1. SNF management and reprocessing

SNF of Russian reactors

Presently there are 12350 tons of SNF in SNF storage facilities at NPPs, including 10288 tons of RBMK SNF.

SNF of RBMK and EPG reactors is stored at NPPs in power plant storage facilities.

The SNF of VVER-1000 reactors is stored in reactor storage pools and after three years of cooling is removed for centralized wet storage at Krasnoyarsk MCC. SNF of VVER-440 and BN-600 is transported to "PA Mayak". SNF of AMB reactors of Beloyarsk NPP is stored at the power plant (5000 SFA) and at "PA Mayak" (2200 SFA).

Table B.1.1 gives the data characteristics of SNF management of different types of reactors as of 01.01.2006.

Table B1.1. SNF placing data

Location		Facility type
NPP		
Kola NPP	VVER-440	Storage
Novovoronezh NPP	VVER-440	
	VVER-1000	
Balakovo NPP	VVER-1000	
Volgodon NPP	VVER-1000	
Kalinin NPP	VVER-1000	
Kursk NPP	VVER-1000	
Leningrad NPP	VVER-1000	
Smolensk NPP	VVER-1000	
Beloyarsk NPP	BN-600	
	AMB	
Bilibino NPP	EGP-6	
NFC		
PO Mayak	VVER-440+AMB	Reprocessing Facility Storage
MCC	VVER-1000	Storage
IPPE	1-st NPP	Storage
RR		
Russian Scientific Center "Kurchatov Institute"	MR	Storage
	IR-8	
Institute of Physics and Power Engineering	AM-1	
	BR-10	
FSUE IRM	IBB-2	
Scientific and Research Institute of Atomic	MIR.M1	
Reactors	SM-3	
	RBT-10/2	
	BOR-60	
	VK-50	

	KORO	
PINPh named after B.P.Konstantinov RAS	VVR-m	Storage
Branch FSUE «Karpov IPC»	VVR-ts	
MIPhI	IRT	
SSU « TPU SRI NF»	IRT-T	
NPI		
MSC, FMB «Lepse»		Storage
MSC, FMB «Lotta»		
MSC, FMB «Imandra»		

In the 2009 it is planned to commission the pilot stage of the dry storage facility to receive 5000 tons of RBMK SNF and to commission by 2016 full-scale dry storage designed for the capacity of 29000 tons of RBMK and AMB SNF and 9000 tons of VVER-1000 SNF.

SNF accumulation dynamics

The assessment calculation of SF accumulation was performed basing on the conditions of operation of existing VVER-1000 power units for 30+15 years, of commissioning of power units in compliance with the medium-term plans for the development of nuclear generating capacities complex and of designed capacity of "wet" and "dry" storages at Krasnoyarsk MCC for VVER SNF (9000 tons each, totally 18000 tons).

In accordance with the existing norms, considered for in the project of VVER SNF storage facility at MCC, the SNF of VVER-1000 should be stored for at least 20 years in the "wet" storage, after which it should be transferred to the "dry" storage.
By 2030-2031 the amount of SNF resulting from reactors operation will constitute more than 18000 tons.

With the account for SNF received for storage at MCC storage facility from foreign NPPs, the capacity of the storage facility may be exhausted even before 2030.
There are 18500 tons of SNF accumulated in the Russian Federation, which is located in on-site and reactor-attached storage facilities, as well as at SNF reprocessing facilities (tabl. B.1.2, Annex B1).

Table B.1.2. Quantities of SNF of different types of reactors at the enterprises

Facility	Fuel type	SNF quantity, metric tons
Kola NPP	VVER-440	116
Novovoronezh NPP	VVER-440	745
	VVER-1000	133
Balakovo NPP	VVER-1000	407
Volgodon NPP	VVER-1000	84
Kalinin NPP	VVER-1000	189
Kursk NPP	VVER-1000	3808
Leningrad NPP	VVER-1000	4240
Smolensk NPP	VVER-1000	2240
Beloyarsk NPP	BN-600	47

Beloyarsk NPP	AMB	192
Bilibino NPP	EGP-6	136
PO Mayak	VVER-440+AMB	360
MCC	VVER-1000	4300
IPPE	1-st NPP	12
MSC, FMB «Lepse»		639*
MSC, FMB «Lotta»		3768*
MSC, FMB «Imandra»		1134*

* the amount of stored irradiated fuel assemblies.

Table B.1.3. List of RW reprocessing facilities

Facility type / organization	Bituminization	Vitrification	Pressing	Incineration	LRW purification	Cementing	Melting	Fragmentation	Decontamination	Other technologies
FSUE MosSPA «Radon»		LRW ILW LLW	SRW ILW LLW	LRW SRW ILW LLW	LRW ILW LLW	LRW SRW ILW LLW		SRW ILW LLW		High-temperature reprocessing RW LLW
FSUE Leningrad SC«Radon	LRW SRW ILW LLW		SRW LLW	SRW LRW ILW LLW	LRW LLW	SRW ILW LLW				
Petersburg Ins. Of Nucl. Phys. RAS					Evaporating, ion-exchange filters LRW ILW LLW					
FSUE SSC NIIAR (RIAR)				SRW LRW LLW		SRW LLW				
FSUE SSC RF IPPE					membrane LRW LLW, evaporating LRW ILW					
FSUE SRTI named after Alexandrov					LRW LLW	LRW LLW				
FSUE R&D Ins. Of Inorganic Materials					Waste water LRW LLW; LRW LLW					
FSUE R&D Ins. SPA "Lutch"					Special water purification LRW LLW					
SUE SPA Radium Institute		LRW SRW HLW			extraction LRW HLW				SRW LLW	
FSUE «NIKIMT»		LRW SRW HLW ILW								

Facility type / organization	Bituminization	Vitrification	Pressing	Incineration	LRW purification	Cementing	Melting	Fragmentation	Decontamination	Other technologies
SSC RF R&D Ins. Of Phys. Chemistry named after Karpov						LRW SRW		SRW ILW LLW		
FSUE PA «Mayak»		LRW HLW			Ion exchange LRW LLW; membrane LRW ILW LLW; centrifuge LRW ILW LLW					
FSUE «UECC»			SRW LLW	SRW LRW ILW LLW, equipment SRW LLW			Non-ferrous metals SRW LLW	SRW LLW	Scrap metal SRW LLW	Liming of LRW
FSUE «SCC»					ion exchange LRW LLW			SRW ILW HLW		
FSUE «MCC»		LRW SRW HLW			ion exchange LRW LLW; non-technology water LRW LLW				SRW LLW	Pulp extraction LRW ILW LLW
Joint Stock Co. «NCCW»				SRW LLW	Centrifuge LRW ILW LLW		Scrap metal			Liming of LRW
FSUE «PA «ECP»				SRW LLW			Scrap metal			
Balakovo NPP	LRW LLW		SRW ILW LLW	SRW LRW ILW LLW	Evaporating LRW $5*10^{-3}$ Ci/l	SRW LRW ILW LLW				
Beloyarsk NPP				SRW LRW ILW LLW		LRW SRW ILW LLW			SRW LLW	
Volgodonsk NPP						LRW SRW ILW LLW				

Facility type / organization	Bituminization	Vitrification	Pressing	Incineration	LRW purification	Cementing	Melting	Fragmentation	Decontamination	Other technologies
Kalinin NPP	LRW LLW		SRW ILW LLW	SRW LRW LLW						
Kola NPP				SRW LLW	Evaporating LRW $5*10^{-3}$ Ci/l					Extraction of LRW
Kursk NPP					Evaporating LRW $5*10^{-3}$ Ci/l	LRW $5*10^{-3}$ Ci/l	Metal SRW LLW; Heat-isolation SRW LLW			
Leningrad NPP	SRW LRW ILW LLW		SRW ILW LLW	SRW ILW LLW	LRW LLW, Evaporating LRW ILW	SRW LLW				BAC coal reprocessing, SRW
Novovoronezh NPP				SRW LRW ILW LLW	Evaporating LRW $5*10^{-3}$ Ci/l					
Smolensk NPP АЭС				SRW LLW		LRW SRW LLW				
Obninsk NPP					Ion-selective LRW LLW					
SUE "Atomflot"				SRW ILW LLW	LRW LLW; centrifuge LRW ILW LLW	LRW LLW				
JSC "Ecoatom"					Centrifuge LRW ILW LLW; "Potok" LRW LLW					
JSC "Ecomet-C"							metal SRW LLW			

Facility type / organization	Bituminization	Vitrification	Pressing	Incineration	LRW purification	Cementing	Melting	Fragmentation	Decontamination	Other technologies
JSC «MBW»				SRW LLW					Scrap metal SRW LLW	Liming of LRW
JSC «ChMW»				SRW LLW				SRW LLW	Scrap metal SRW LLW	Liming of LRW

Table B.1.4. List of NI under decommissioning

Operating organization	NI type	Year of shut-down
NPP		
Beloyarsk NPP	AMB-100	1981
	AMB-200	1989
Novovoronezh NPP	VVER-210	1984
	VVER-365	1990
RR		
FSUE SSC RF ITEP	TVR ITEP	1987
FSUE SSC RF NIIAR (RIAR)	ACT-1	2000
FSUE NIIP	VVRL-02	2003
	VVRL-03	2003
	IIN-3M	2005
FSUE SSC IPPE	AM-1	1999
	BR-10	1999
FSUE NITI named after A.P.Alexandrov	PPU	2004
	PPU	2004

Annex B2. RW management and disposal

Table B.2.1. Permissible content of radionuclides in RW disposed in subsurface storage facilities (NP-055-04)

Radionuclides	Activity, Bq/m^3 (Bq/g)
Radionuclides with less than 5 years halflife	unlimited
H3	unlimited
C-14	3.0×10^{11} Bq/m^3
C-14 in activated metal	3.0×10^{12} Bq/ m^3
Ni-59 in activated metal	8.1×10^{12} Bq/ m^3
Co-60	Unlimited
Ni-63	2.6×10^{13} Bq/ m^3
Ni-63 in activated metal	2.6×10^{14} Bq/ m^3
Sr-90	2.6×10^{14} Bq/ m^3
Nb-94 in activated metal	7.4×10^{9} Bq/ m^3
Cs-137	1.7×10^{14} Bq/ m^3
Nc-99	1.1×10^{11} Bq/ m^3
I-129	3.0×10^{9} Bq/ m^3
Pu-241	1.3×10^{5} Bq/g
Cm-242	7.4×10^{5} Bq/g
Uranium and transuranium alpha-emitting radionuclides with more than 5 years halflife	3.7×10^{3} Bq/g

For the waste, which contains mixture of radionuclides, total concentration is determined as "the sum of shares" by dividing the concentration of each nuclide by the relevant permissible concentration. The sum of shares should not exceed 1.0.

In case RW does not contain radionuclides given in the above table, then this RW is in the category with no restrictions for subsurface disposal.

Upper (conservative) value of 3.7×10^{3} Bq/g for Uranium and Uranium alpha-emitters with half-life longer than 5 years is permissible for some RW packages under the condition, that their average activity in the RW storage facility would not exceed 370 Bqw/g.

Firstly it should be noted, that the enterprises which are not under Rosatom authority, store less than 0.2% of liquid RW and about 97.7% of solid RW (by mass).

In 2004 the enterprises within Rosatom jurisdiction have generated 4.3 mln.m^3 of liquid RW with total activity of $3.72 \cdot 10^{18}$Bq. About 96% of the total activity of RW generated during this year is contained in liquid radioactive waste (LRW).

The main amount of generated LRW – about 4 mln. m^3 - is low activity RW. The correlation of the volumes and activities of LRW of different categories is given in Table B.2.2.

Table B.2.2. Volumes and activities of different liquid RW categories

LRW total	Volume	Activity
	4.3 mln.m^3- 100%	$3.72 \cdot 10^{18}$ Bq – 100%
Low activity	93.52%	0.02%
Intermediate activity	6.13%	10.98%
High activity	0.35%	89%

The most part of the volume of liquid RW, generated during the reported year, belong to the three enterprises: MCC (20%), FSUE "PA Mayak" (22.3%) and SCC (55.5%). The share of other enterprises comprises about 2% of the total volume.
Table B.2.3. gives the distribution by categories of 1.1 mln. tons of solid RW, generated in nuclear industry in 2004.

Table B.2.3. Volumes and activities of different solid RW categories

SRW total	Nuclear industry			
	by mass	by activity	by mass	by activity
	1.1 mln.t (100%)	1.6×10^{17}Bq (100%)	3.39%	99.999%
Low activity	99.57%	0.0002%	2.96	3.8×10^{-8}%
Intermediate activity	0.24%	0.0009%	0.24	8.7×10^{-6}%
High activity	0.19%	99.999%	0.19	99.999%

The total activity of the generated solid RW is determined by high activity RW of FSUE "PA Mayak". "PA Mayak" has generated 495 tons of vitrified RW as the result of reprocessing of high activity liquid RW.

Totally the enterprises within Rosatom jurisdiction have reprocessed 3.57 mln.m^3 of liquid RW and 5 900 tons of solid RW. During the last few years the rate of reprocessing of high activity liquid RW exceeds the rate of annual generation, and the rates of reprocessing and generation of low activity liquid RW have become nearly equal.

As far as the storage conditions of accumulated RW are concerned, then, for example, 93.7% of all accumulated liquid RW is low activity waste. The main amount of this RW is located at FSUE "PA Mayak", and SCC and is not isolated from the environment of the storage facilities (special industrial water basins and accumulation vessels).

The major part of medium activity liquid waste (85%) is isolated from the environment and is concentrated at the enterprises: SCC, MCC and NIIAR. It should be noted that all high activity liquid RW is isolated from the environment.

The main part of LRW accumulated at the enterprises reportable to Rosatom is low-level waste which activity was $1.47*10^{16}$ Bq (about 0.03% of the total activity of LRW), of which 88.7% is held in storage facilities (special water reservoirs and accumulator ponds at FSUE PA Mayak and SCC.

The major part of solid RW is low activity waste and is located at enterprises: PMCPA(72%), Joint Stock Company, open type "Hydrometallurgical Works"(19%) and CMP(4.6%).

The major part of accumulated high activity waste is vitrified waste, fuel pin claddings, contaminated equipment, spent radionuclide sources, located at FSUE "PA Mayak" and SCC. This RW is located in specialized buildings or structures and is isolated from the environment.

The principle problem for the nearest years is the reduction of the share of waste which is stored without isolation from the environment and the establishment of RW conditioning capacities.

Among the most urgent issues of ecological problems in RW management the following examples should be highlighted:

- open surface reservoirs: liquid RW storages, including the lake of Karachai and Techa cascade of reservoirs (FSUE "PA Mayak");
- the lack of technologies for reprocessing of some kinds of RW, including explosion- and fire-hazardous organic substances.

NPPs and nuclear fuel cycle enterprises are presently the main source of generation and accumulation of new RW.
As the roughest estimates show, from RW accumulated by the present time, up to 20% were generated by NPPs, and the major part of the rest – at nuclear fuel cycle enterprises.
The last circumstance is causes by the operation of radiochemical production facilities. Due to the use of liquid and extraction technologies, per one kilogram of power reactor RW (by U) about 45 m^3 of high activity, 150 m^3 of medium activity and 2000 m^3 of low activity liquid RW are generated.

Additional source of RW accumulation is the accumulation of ionizing radiation sources with expired operational life. In accordance with Rostechnadzor statistics, there are 115 000 such sources accounted for by the supervising authorities.

Decommissioning of RTGs with expired life is a problem by itself.

Presently there are more than 700 RTGs in Russia in operation or subject to decommissioning. In 10 – 15 years the planned operational life of all RTGs in operation presently will be over. Rosatom has developed the routine for organization of works for decommissioning of RTGs and has determined the timeframe, when such works should be completed.

One of the problems of safe management of RTGs is explained by the fact that the organizations which perform the operation of RTGs, belong to different departments.

The standing Interdepartmental Coordinating Group for RTG Decommissioning has been established for the inter-industry coordination of their actions, which is the present-time responsibility of Rosatom..

Taking into consideration the radiological threat of RTGs (initial activity is close to 500 kCi) this problem is being solved also within the frames of international cooperation, for example, within the "Global initiative" aimed at preventing the proliferation of weapons of mass destruction.

Annex E. Information on the principal legal documents

Annex E contains the information on the principal legal documents (international agreements, federal laws, decrees and orders by the President of the Russian Federation, decrees of the Government of the Russian Federation) which regulate the activities in the area of safe management of spent fuel and safe management of radioactive waste, as well as the relevant normative documents.

E1. Principal International Agreements of the Russian Federation

No.	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

E2. Federal Laws of the Russian Federation

No.	Title of the document	Registration No. and the year when the document was signed
1	On the use of atomic energy, with amendments and supplements	No.170-FZ of November 21,1995
2	On the entrails, with amendments and supplements	No. 2395-1 of February 221, 1992
3	On assuring uniformity of measurements	No. 4871-1p of April 27, 1993
4	On the protection of the population and territories against emergencies of natural and man-caused origin	No.68-FZ of December 21, 1994
5	On fire safety, with amendments	No.69-FZ of December 21, 1994
6	Water Code of the Russian Federation	No.167-FZ of November 16, 1995
7	On ecologic review, with amendments	No.174-FZ of November 23, 1995
8	On radiation safety of the population	No.3-FZ

		of January 9, 1996
9	On financing of specially radiation hazardous and nuclear hazardous production enterprises and facilities	No.29-FZ of April 3, 1996
10	On industrial safety of hazardous production facilities, with amendments and supplements	No.116-FZ of July 21, 1997
11	On safety of hydraulic facilities, with amendments and supplements	No.117- FZ of July 21, 1997
12	On anti-terrorism struggle	No.130-FZ of July 25, 1998
13	On sanitary and epidemiological well-being of the population, with amendments and supplements	No.52-FZ of March 30, 1999
14	On departmental guards, with amendments and supplements	No.77- FZ of April 14, 1999
15	On special ecological programs of remediation of territories with radioactive contamination	No.92- FZ of July 10, 2001
16	Code of the Russian Federation on administrative infringement of the law, with amendments	No.195-FZ of December 30, 2001
17	On the protection of the environment	No.7- FZ of January 10, 2002
18	On technical regulation	No.184- FZ of December 27, 2002
19	On licensing of some kinds of activities	No.128- FZ of August 8, 2001
20	On making amendments and supplements to the laws of the Russian Federation in association with passing the Federal Law "On counteraction to extremist activities"	No.112- FZ of July 25, 2002
21	On making amendments and supplements to the Criminal Code of the Russian Federation, Procedural Criminal Code of the Russian Federation and the Code of the Russian Federation on Administrative Infringements	No.133- FZ of October 31, 2002

E.3. Decrees and Orders of the President of the Russian Federation

No.	Title of a decree or an order	Registration number and the date of a decree or an order
1	On the control of export from the Russian Federation of nuclear material, equipment and production technologies	No.312, March 27, 1992
2	On the operating organization of nuclear power plants of the Russian Federation	No.1055, September 7, 1992
3	On the fulfillment by the Russian Federation of	No.472,

	intergovernmental agreements on cooperation in construction of nuclear power plants abroad	April 21, 1993
4	On the state support of the restructuring and conversion of nuclear industry in the city of Zheleznogorsk of Krasnoyarsk region	No.72, January 25, 1995
5	On the complementary measures to enhance the control of the fulfillment of the requirements of ecological safety in spent nuclear fuel reprocessing	No. 389, April 20, 1995
6	On the perfection of the management of the enterprises of nuclear fuel cycle	No.166, February 8, 1996
7	On the approval of the List of nuclear material, equipment, special non-nuclear material and relevant production technologies, subject to export control	No.202, February 14, 1996
8	On the guarantees of safe and sustainable functioning of nuclear power industry in the Russian Federation	No.1012, July 2, 1996
9	On federal executive authorities authorized to perform state regulation of safety in using atomic energy	No.26, January 21, 1997
10	The scope of the Ministry of the Russian Federation of civil defense issues, emergency situations and elimination of the consequences of natural disasters	No.953, August 2, 1999
11	On the perfection of state management in the area of fire safety	No.1309, November 9, 2001
12	On special commission on the issues of import of irradiated fuel assemblies of foreign manufacture to the territory of the Russian Federation	No. 828, July 10, 2001
13	On the approval of the Statute of the special commission on the issues of import of irradiated fuel assemblies of foreign manufacture to the territory of the Russian Federation and its composition	No. 858, July 31, 2003
14	On the approval of the List of organizations operating especially radiation hazardous and nuclear hazardous production facilities and objects	No. 2186-r, December 9, 2005

E.4. Regulations of the Government of the Russian Federation

No.	Title of a regulation	Number and the date of a regulation
01.	On the approval of the routine for the inventory of the places and facilities for the recovery, transportation, reprocessing, use, collection, storage and disposal of radioactive substances and ionizing radiation sources on the territory of the Russian Federation	No. 505, July22, 1992
02.	On the approval of the Regulations on non-departmental guarding attached to the authorities of the Ministry of	No. 589, August 14, 1992

	the Interior of the Russian Federation	
03.	On the measures for comprehensive resolving the problems of management of radioactive waste and cessation of disposal of RW into the seas	No. 710, July 23, 1993
04.	On the approval of the Status of State ecological expertise	No. 942, September 22, 1993
05	On the approval of the Routine of receiving for further reprocessing at Russian enterprises of spent nuclear fuel of foreign nuclear power plants and the return of the resulting radioactive waste and material	No. 773, July 29, 1995
06.	On the approval of the Regulation of export from the Russian Federation and import to the Russian Federation of radioactive substances and items on the basis thereof	No. 291, March 16, 1996
07.	On the measures for the fulfillment of the Decree of the President of the Russian Federation of February 8, 1996 No. 166 "On the perfection of the management of the enterprises of nuclear fuel cycle"	No. 677, June 11, 1996
08.	On the approval of the Regulation on the routine of performing state ecologic review	No. 698, June 11, 1996
09.	On the Concept of the system for state nuclear material accounting and control	No. 1205, October 14, 1996
10.	On the routine for the development of radiation hygiene certificates ("passports") of organizations and territories	No. 93, January 28, 1997
11.	On the list of medical contra-indications and the list of positions which are covered by the above contra-indications, as well as on the requirements for performing medical examinations and psycho-physiological tests of the workers of nuclear facilities	No. 233, March 1, 1997
12.	On the approval of the list of the positions of the workers of nuclear facilities who must get the permission of the Federal Supervision of Russia for nuclear and radiation safety for the right of performing works in the area of atomic energy use.	No. 240, March 3, 1997
13.	On the approval of the Rules of physical protection of nuclear material, nuclear installations and nuclear material storage facilities	No. 264, March 7, 1997
14.	On determining the territories adjacent to specially radiation hazardous and nuclear hazardous enterprises and facilities, and on formation and use of centralized funds for financing of the measures for social protection of the population on the above territories as well as for financing of the development of the social infrastructure of these territories in compliance with the Federal Law "On financing of specially radiation hazardous and nuclear hazardous production enterprises and facilities"	No. 289, March 12, 1997

15.	On the Rules for decision-making on siting and construction of nuclear facilities, radiation sources and storage facilities	No. 306, March 14, 1997
16.	On the approval of the Regulation on licensing of activities in the area of atomic energy use	No. 865, July 14, 1997
17.	On the approval of the Rules of the preparation of normative legal documents of the federal executive authorities and federal registration thereof	No. 1009, August 13, 1997
18.	On the approval of the Rules of organizing the system of state accounting and control of radioactive substances and radioactive waste	No. 1298, October 11, 1997
19.	On the approval of the Regulation on the development and approval of federal norms and rules in the area of use of atomic energy and the list of federal norms and rules in the area of use of atomic energy	No. 1511, December 1, 1997
20.	On the approval of the Rules of organizing the system of state accounting and control of nuclear material	No. 746, July 10, 1998
21.	On the state body specifically authorized to sign the agreements for the transfer of nuclear material in federal ownership to from the federal property to legal entity for use	No. 1117, September 15, 1998
22.	On the approval of the Regulations of declaring safety of hydraulic structures	No. 1303, November 6, 1998
23.	On the use of technical devices at hazardous production facilities	No. 1540, December 25, 1998
24.	On the measures to counteract terrorism	No. 1040, September 16, 1999
25.	On the approval of the Regulations on social-hygienic monitoring	No. 426, June 1, 2000
26.	On organizing of departmental guarding	No. 514, July 12, 2000
27.	On the approval of the Regulations on state sanitary-epidemiologic service and the Regulations on state sanitary-epidemiologic normalization	No. 554, July 24, 2000
28.	Regulations on state accounting and control of radioactive substances and radioactive waste in the Russian Federation	No. 962, December 15, 2000
29.	On export and import of nuclear material, equipment, special non-nuclear material and relevant production technologies	No. 973, December 15, 2000
30.	On the routine of executing state review and approval of town-planning, preproject and project documentation	No. 1008, December 27, 2000
31.	On the approval of the Statute of the departmental guard of the Ministry of the Russian Federation of atomic energy	No. 139, February 22, 2001

32.	On state competent authority on nuclear and radiation safety in transportation of nuclear material, radioactive substances and items made thereof	No. 204, March 19, 2001
33.	On the approval of the Regulation on executing control of foreign trade activities in relation to the dual-purpose equipment and materials as well as relevant production technologies used for nuclear purposes	No. 462, June 14, 2001
34.	On the approval of the Statute of the Federal Environmental, Industrial and Nuclear Supervision Service	No. 401, April 22, 2002
35.	On the approval of the Regulation for licensing of transportation of passengers and goods by road	No. 402, June 10, 2002
36.	On Russian scientific center "Kurchatov Institute"	No. 778, October 29, 2002
37.	On the routine of import to the Russian Federation of irradiated fuel assemblies of nuclear reactors	No. 418, July 11, 2003
38.	On the approval of the Regulation on financing of special ecological programs for rehabilitation of areas of territories with radioactive contamination	No. 588, September 22, 2003
39.	On the approval of the Statute of the Federal agency for atomic energy	No. 316, June 28, 2004
40.	On the approval of the Regulation for the development of special ecological programs for rehabilitation of areas of territories with radioactive contamination	No. 421, July 14, 2003

E.5. Norms and rules

No.	Title of the document	Department, ministry or official person which /who has approved the document, year of approval
01.	General provisions on assuring safety of nuclear fuel cycle facilities. OPB OJaTTs NP-016-2005	Rostechnadzor, 2005
02.	Radiation safety norms. NRB-99 SP 2.6.1.758-99	Sanitary Inspector General of the Russian Federation, July 2, 1999
03.	Basic sanitary rules to assure radiation safety. OSPORB - 99	Sanitary Inspector General of the Russian Federation, December 29, 1999
04.	Sanitary norms and rules for design, operation, conservation, elimination (disposal) of the tails of hydrometallurgical plants and concentrating mills	Minatomenergoprom of the USSR, 1992

05.	Fire safety rules in the Russian Federation. PPB 01-93.	Main Administration of the state fire-fighting service of the Ministry of Internal Affairs of the Russian Federation, December 14, 1993
06.	Fire preventing at enterprises. General requirements. NPB 201-96	Main Administration of the state fire-fighting service of the Ministry of Internal Affairs of the Russian Federation, 1996
07.	Accounting for the external impact of natural and man-caused origin on nuclear- and radiation-hazardous facilities. PNAE G-05-35-94	Gosatomnadzor of Russia, 1995
08.	Spent nuclear fuel reprocessing facilities. Safety requirements. NP-013-99	Gosatomnadzor of Russia, 1999
09.	Safety rules in storage and transportation of nuclear fuel at nuclear power facilities. PNAE G-14-029-91	Gospromatomnadzor of the USSR, 1991
10.	Spent nuclear fuel dry storage facilities. Safety requirements. NP-035-02	Gosatomnadzor of Russia, 2002
11.	Requirements to quality assurance program for nuclear fuel cycle facilities. NP-041-02	Gosatomnadzor of Russia, 2002
12.	Requirements to quality assurance program for nuclear power plants. NP-011-99	Gosatomnadzor of Russia,1999
13.	Siting of nuclear fuel cycle facilities. Principal criteria and safety assurance requirements. NP-050-03	Gosatomnadzor of Russia, 2003
14.	Radioactive waste disposal. Principles, criteria ans basic safety requirements. NP-055-04	Gosatomnadzor of Russia, 2004
15.	Sanitary rules for radioactive waste management. SPORO-2002	Sanitary Inspector General of the Russian Federation, October 23, 2002
16.	Sanitary norms and rules for elimination, conservation, and changing the production profile of the enterprises for extraction and reprocessing radioactive ores. SP LKP-91 No. 60028-91	Ministry of health care of the USSR, Minatomenergoprom of the USSR, 1991
17.	The requirements to the justification of the designed life extension of nuclear power facilities.	Gosatomnadzor of Russia, 2000

	NP-024-2000	
18.	Collection, reprocessing, storage and conditioning of liquid radioactive waste. Safety requirements. NP-019-2000	Gosatomnadzor of Russia, 2000
19.	Collection, reprocessing, storage and conditioning of solid radioactive waste. Safety requirements. NP-020-2000	Gosatomnadzor of Russia, 2000
20.	Gaseous radioactive waste management. Safety requirements. NP-021-2000	Gosatomnadzor of Russia, 2000
21.	Sanitary rules for radiation safety of personnel and population in transportation of radioactive material (substances). SanPiN 2.6.1.1281-03	Ministry of health care of Russia, 2003
22.	Safety rules in transportation of radioactive material. NP-053-04	Rostechnadzor, 2004
23.	Safety in radioactive waste management. General provisions. NP-058-04	Rostechnadzor, 2004
24.	Safety assurance rules in decommissioning of nuclear fuel cycle nuclear facilities. NP-057-04	Rostechnadzor, 2004
25.	Regulations on the routine of investigation of and accounting for the violations in the operation of nuclear fuel cycle facilities. NP-047-03	Gosatomnadzor of Russia, 2003
26.	Requirements to the safety justification report for nuclear fuel cycle nuclear facilities. NP-051-04	Rostechnadzor, 2004
27.	Requirements to the safety justification report for radioactive waste storage facilities in the aspect of accounting for external impacts. PNAE G-14-038-96	Gosatomnadzor of Russia, 1996
28.	The Guide for the analysis of the hazard of emergency explosions and determining the parameters of their mechanical impact. RB G-05-039-96	Gosatomnadzor of Russia, 1996
29.	Determining the initial seismic ground oscillations for the design basis. RB-006-98	Gosatomnadzor of Russia, 1998
30.	Requirements to quality assurance program in radioactive waste management. RB-003-98	Gosatomnadzor of Russia, 1998

31.	Provisional regulations on the routine of issuing certificates-permissions for special form radioactive material, for the design and transportation of a package with radioactive substances. PVSR-92 with amendments No.1 of 1993, No.2 of 1998, No. 3 of 1999.	Gosatomnadzor of Russia, Minatom of Russia, 1992
32.	The assessment of seismic hazard of the areas of siting of nuclear- and radiation-hazardous facilities on the basis of geo-dynamic data. RB-019-91	Gosatomnadzor of Russia, 2001
33.	Recommendations for the assessment of tornado characteristics as applied to nuclear power facilities. RB-022-01	Gosatomnadzor of Russia, 2001
34.	Recommendations for setting the criteria for the acceptability of conditioned radioactive waste for the storage and disposal thereof. RB-023-02	Gosatomnadzor of Russia, 2002
35.	The Guide for the review by the central staff of Gosatomnadzor of Russia of the application and documents submitted to get the license for the activity in the area of atomic energy use. RD-03-08-2004	Gosatomnadzor of Russia, 2004
36.	Regulation on the routine of executing the review of the documents, justifying nuclear and radiation safety of a nuclear facility, radiation source, storage facility and (or) the quality of the announced activity. RD-03-13-99	Gosatomnadzor of Russia, 1999
37.	Regulation on certification of software tools used in justification of nuclear power facilities. RD-03-17-2001	Gosatomnadzor of Russia, 2001
38.	Basic regulations for preparation, review and taking decision for changing project, technological and operational documentation, having effect on assuring nuclear and radiation safety. RD-03-19-94	Gosatomnadzor of Russia, 1994
39.	Regulation on the routine of the review, preparation of conclusions, coordination and approval of normative documents in the area of nuclear energy use by Gosatomnadzor of Russia. RD-03-22-98	Gosatomnadzor of Russia, 1998

40.	Regulation on the routine of the development of federal norms and rules in the area of atomic energy use, approved by Gosatomnadzor of Russia. RD-03-23-98	Gosatomnadzor of Russia, 1998
41.	Requirements to the composition and the content of the report on verification and justification of software tools used for justification of safety of nuclear power facilities. RD-03-34-2000	Gosatomnadzor of Russia, 2000
42.	The Guide for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. RD-03-35-96	Gosatomnadzor of Russia, 1996
43.	Conditions of supply of imported equipment, items, materials and utilities for nuclear facilities, radiation sources and storage facilities of the Russian Federation. RD-03-36-2002	Gosatomnadzor of Russia, 2002
44.	On the routine of issuing the duplicate of the license of Gosatomnadzor of Russia. RD-03-37-97	Gosatomnadzor of Russia, 1997
45.	Requirements to the composition and the content of the documents justifying the ability of an organization to perform the review of the documents, justifying safety in using atomic energy and/or the quality of the announced activity. RD-03-39-98	Gosatomnadzor of Russia, 1998
46.	Requirements to the composition of the package and the content of the documents justifying the activity in design and manufacture of the equipment for nuclear energy facilities. RD-03-41-2002	Gosatomnadzor of Russia, 2002
47.	The Guide on the routine of development and revision of safety guides in the area of atomic energy use. RD-03-56-2001	Gosatomnadzor of Russia, 2001
48.	Regulation on assuring safety in the system of Gosatomnadzor of Russia. RD-03-57-2002	Gosatomnadzor of Russia, 2002
49.	Requirements to the composition and the	Gosatomnadzor of Russia,

	content of the information on justification of technical safety of steam- and water-boilers, pressure vessels, steam and hot water pipes, hoisting cranes of nuclear energy facilities. RD-03-58-2001	2001
50.	Requirements to the annual report on nuclear and radiation safety of fuel cycle enterprises. RD-05-11-95, with amendment No.1 put in effect by the order of Gosatomnadzor of Russia of 31.10.97 No.77	Gosatomnadzor of Russia, 1995
51.	Requirements to the composition of the package and the content of the documents justifying assurance of nuclear and radiation safety of licensed activities and facilities of fuel cycle enterprises, as well as licensed activities and the facilities of the organizations, performing works and rendering services to the enterprises of the fuel cycle. RD-05-15-2002	Gosatomnadzor of Russia, 2002
52.	Regulation on the routine of issuing permissions by Gosatomnadzor of Russia for the right of performing works in the area of atomic energy use to the workers of nuclear fuel cycle facilities. RD-05-17-2001	Gosatomnadzor of Russia, 2001
53.	The Guide on performing inspections in the process of licensing in the area of atomic energy use to the workers of nuclear fuel cycle facilities. RD-05-18-99	Gosatomnadzor of Russia, 1999
54.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. Principal provisions.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1998
55.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The provision on the central body of the system.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1998
56.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The provision on the working body.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1998
57.	The system for certification of equipment, items and production technologies for nuclear	Gosatomnadzor of Russia, Minatom of Russia,

	facilities, radiation sources and storage facilities. The requirements to the certification expert centers and the routine for their accreditation.	Gosstandard of Russia, 1999
58.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The requirements to the test laboratories and the routine for their accreditation.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1999
59.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The provision on the compliance mark.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1999
60.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. Requirement to experts-auditors. The routine for training and certification of them.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1999
61.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The provisions on the state register of the system.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1999
62.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. Certification routine.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1999
63.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. Basic curriculum of the training centers of the System.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1999
64.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. Nomenclature of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities, subject to compulsory certification.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2000
65.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The provision on executing the	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2000

	functions of certification bodies.	
66.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The routine of accrediting of the training centers of the System.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 1999
67.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The routine for certification of quality systems (production facilities)	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2001
68.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The routine for the development and maintaining of the Nomenclature certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities, subject to compulsory certification.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2001
69.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The routine for the review of appeals.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2001
70.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The regulation on organization and execution of inspections.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2001
71.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The routine for revalidation of certificates issued in other certification systems.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2001
72.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. The requirements to normative and other documents used for certification in the System.	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2001
73.	The system for certification of equipment, items and production technologies for nuclear facilities, radiation sources and storage facilities. Regulation on organizing information	Gosatomnadzor of Russia, Minatom of Russia, Gosstandard of Russia, 2001

	support.	
74.	The requirements to certification of civil engineering structures, important for the safety of nuclear energy facilities. RB-005-98	Gosatomnadzor of Russia, 1998
75.	Branch-of-industry rules for the design and operation of the alarm signaling system on the initiation of the self-sustained chain reaction and organization of the measures to mitigate its consequences. PBJa-06-10-99	Minatom of Russia, 1999
76.	The principal requirements to the instrumentation means of control of nuclear safety parameters.	Minatomenrgoprom of the USSR, 1991
77.	Manual. The routine of the development and the manufacture of nuclear reactors' cores and components thereof. RD 95.540-88	Minsredmash of the USSR, 1989. Agreed by Gosatomenergonadzor of the USSR
78.	Norms for strength calculations of transportation packagings for fissile material transportation. NRP-93	Minatom of Russia, 1993
79.	Rules for the design and safe operation of hoisting cranes. PB-10-382-00	Gosgortekhnadzor of Russia, 1999
80.	System for emergency alarm and management of evacuation of people in fires in buildings and structures. NBP-104-03	Ministry for emergency situations of Russia, 2003
81.	Determining the categories of fire- and explosion hazard of the premises, buildings and structures	Ministry for emergency situations of Russia, 2003
82.	The list of buildings, structures, premises and equipment subject to protection by automatic fire-extinguishing installations and automatic fire alarm. NBP-110-03	Ministry for emergency situations of Russia, 2003
83.	Rules for the design of electric installations. PUE, 6-th edition Rules for the design of electric installations. 7-th edition, sections 6,7	Minenergo of Russia, 1998 Minenergo of Russia, 1999
84.	Hygienic requirements to the development of projects of the enterprises and installations of nuclear industry (SPP PUAP-2003)	Minzdrav (Ministry of health care) of Russia

85.	Methodological guidelines on operation and conservation of deep storage facilities for liquid radioactive and chemical waste of nuclear industry enterprises (MU EGKhK 2003)	Minatom of Russia, 2003
86.	Rules to assure safety in temporary storage of radioactive waste resulting from mining, reprocessing and use of mineral resources. NP-052-04	Rostechnadzor of Russia, 2004
87.	Rules of investigation and accounting for violations in management of radioactive sources and radioactive substances used in national economy. NP-014-2000	Gosatomnadzor of Russia, 2000
88.	Requirements to the content of the report on justification of radiation sources safety. NP-039-02	Gosatomnadzor of Russia, 2002
89.	Composition and content of the report on the condition of radiation safety at radiation hazardous facilities. RB-012-04	Rostechnadzor of Russia, 2004
90.	Safety assessment of subsurface radioactive waste storage facilities. RB-011-2000	Gosatomnadzor of Russia, 2000
91.	Model conditions of the effect of the license for the operation of radiation sources and for the management of radioactive substances at radiation hazardous facilities. RD-10-01-2004	Rostechnadzor of Russia, 2004
92.	Regulation on issuing the permissions by the Federal Supervisory Body of Russia for nuclear and radiation safety for the right to perform works in the area of uses of atomic energy to the workers of radioactive waste storage facilities (specialized enterprises for radioactive waste management) and enterprises (institutions, organizations) which operate radiation sources. RD-07-14-2001	Gosatomnadzor of Russia, 2001
93.	Transport packagings for radioactive substances. General specifications. GOST 16327-88	Transport packagings for radioactive substances. General specifications. GOST 16327-88
94.	Special form radioactive material. General technical requirements and testing methods. GOST R 50629-93	Gosstandard of Russia, 1993

95.	Sealed radioactive sources. General provisions. GOST R 50830-95	Gosstandard of Russia, 1995
96.	Sealed radionuclide ionizing radiation sources. General technical requirements. GOST 27212-87	Gosstandard of Russia, 1987
97.	Ingots of ferrous and non-ferrous metals. Permissible levels of specific activity of gamma-emitting radionuclides. Radiation monitoring method. GOST R 51713-2001	Gosstandard of Russia, 2001
98.	Recommendations on application of methods and technical means for identification and determining the composition of nuclear material in performing supervision of the status of MN accounting and control. RD-08-09-94	Gosatomnadzor of Russia, 1994
99.	Model requirement to the content of the manual for organizing accounting and control of nuclear material in the form of accounting units at nuclear facilities and at nuclear material storage facilities. RD-08-13-97	Gosatomnadzor of Russia, 1997
100.	Model requirement to the content of the manual for organizing accounting and control of nuclear material in bulk-form at nuclear facilities and at nuclear material storage facilities. RD-08-17-98	Gosatomnadzor of Russia, 1998
101.	Regulation on ensuring physical protection of nuclear-propelled vessels and nuclear maintenance vessels. RD 31.2.01-2001	Mintrans (Ministry of transport) of Russia 2001
102.	Rules of transportation of hazardous freights by road	Mintrans of Russia, 1995
103.	Technical manuals for safe transportation of hazardous freights by air	IKAO 1997-1998
104.	Rules of transportation of hazardous freights by rail	Mintrans of Russia, 1996
105.	Basic rules for accounting and control of nuclear material	Gosatomnadzor of Russia, 2001
106.	Rules for physical protection of radiation sources, storage facilities, radioactive substances. NP-034-01	Gosatomnadzor of Russia, 2001
107.	On the approval of the format of departmental	Minatom of Russia,

	statistical accounting	1998, agreed with Goscomstat (State Statistics Committee) of Russia in 1998
108.	Basic rules for accounting and control of radioactive substances and radioactive waste in organizations. (NP-067-05)	Rostechnadzor of 26.12.2005, No. 18. To be put into effect since May 1, 2006.
109.	General Regulations on assuring safety of nuclear fuel cycle facilities (NP-016-050)	OPB OJaTTs. To be put into effect since May 1, 2006.

Annex F1. Operating Organizations

The list of the main organizations, which perform activities in the area of spent fuel and radioactive waste management and possessing the status of operating organizations in compliance with the Decree of the Government of the Russian Federation of 09.12.2005 No. 2186-r

- Federal State Unitary Enterprise "Production association "Majak", city of Ozersk, Cheyabinsk region
- Federal State Unitary Enterprise "Mining and Chemical Combine", city of Zheleznogorsk, Krasnoyarsk region
- Federal State Unitary Enterprise "Siberian Chemical Combine", city of Seversk, Tomsk region
- Federal State Unitary Enterprise "Angarsk Electrolysis Chemical Combine", city of Angarsk, Irkutsk region
- Federal State Unitary Enterprise "Urals Electrochemical Combine", city of Novouralsk, Sverdlovsk region
- Federal State Unitary Enterprise "Production Association "Electrochemical Works", city of Zelenogorsk, Krasnoyarsk region
- Joint stock company, open type "Novosibirsk Chemical Concentrates Works", city of Novosibirsk
- Joint stock company, open type ""Machine Engineering Works", city of Elektrostal, Moscow region
- Joint Stock Company, open type "Chemical and Metallurgical Works", city of Krasnoyarsk
- Joint Stock Company, open type "Priargunskoye Mining and Chemical Production Association", city of Krasnokamensk, Chita Region
- Joint Stock Company, open type ""Khiagda", settlement Bugdarin, Bauntovsky region of Buryat Republic
- Joint Stock Company, closed type ""Dalur", settlement Uksianskoye, Dalmatovsky district, Kurgan region
- Joint Stock Company, open type "Chepetsk Mechanical Works", city of Glazov, Republic of Udmurtiya
- Joint Stock Company, open type "Hydrometallurgical Works", city of Lermontov, Stavropol region
- Federal State Unitary Enterprise "Scientific and Research Institute – Scientific-Production Association "Lutch", city of Podolsk, Moscow region
- Federal State Unitary Enterprise "State Scientific Center of the Russian Federation – Institute of Physics and Power Engineering named after A.I.Leipunsky", city of Obninsk, Kaluga region
- Federal State Unitary Enterprise "State Scientific Center of the Russian Federation – Research Institute of Atomic Reactors", city of Dimitrovgrad, Ulyanovsk region
- Federal State Unitary Enterprise "Reasearch and Development Institute of Power Engineering named after N.A. Dollezhal" (NIKIET)

- Federal State Unitary Enterprise "Scientific and Research Technological Institute named after A.P.Alexandrov", Sosnovy Bor, Leningrad region
- Federal State Unitary Enterprise "Electrogorsk Scientific and Research Center for Safety of Nuclear Power Plants", Electrogorsk, Moscow region
- Federal State Unitary Enterprise "Russian State Concern for Electric and Thermal Energy Generation at Nuclear Power Plants ("Rosenergoatom" Concern) with the following branches:
  - Branch of "Rosenergoatom" Concern "Balakovo Nuclear Power Plant", city of Balakovo, Saratov region
  - Branch of "Rosenergoatom" Concern "Beloyarsk Nuclear Power Plant", city of Zarechnyi, Sverdlovsk region
  - Branch of "Rosenergoatom" Concern "Bilibino Nuclear Power Plant", city of Bilibino, Chukotka autonomous district
  - Branch of "Rosenergoatom" Concern "Kalinin Nuclear Power Plant", city Udomlia, Tver region
  - Branch of "Rosenergoatom" Concern "Kola Nuclear Power Plant" city of Poliarnye Zori, Murmansk region
  - Branch of "Rosenergoatom" Concern "Kursk Nuclear Power Plant" city of Kurchatov, Kursk region
  - Branch of "Rosenergoatom" Concern "Novovoronezh Nuclear Power Plant", city of Novovoronezh, Voronezh region
  - Branch of "Rosenergoatom" Concern "Smolensk Nuclear Power Plant", city of Desnogorsk, Smolensk region
  - Branch of "Rosenergoatom" Concern "Leningrad Nuclear Power Plant", city of Sosnovij Bor, Leningrad region
  - Branch of "Rosenergoatom" Concern "Volgodonsk Nuclear Power Plant", city of Volgodonsk, Rostov region
- Joint stock company, open type "Murmansk Shipping Co.", city of Murmansk
- Federal State Unitary Enterprise of Nuclear-Propelled Fleet, city of Murmansk
- Federal State Unitary Enterprise "All-Russia Scientific and Research Institute for Inorganic Materials named after Academician A. A. Bochvar", city of Moscow
- Federal State Unitary Enterprise "All-Russia Scientific and Research Institute for Chemical Technology", city of Saint-Petersburg
- Federal State Unitary Enterprise "Scientific and Production Association "Radium Institute named after V.G.Khlopin", city of Saint-Petersburg
- Federal State Unitary Enterprise "State Scientific Center of the Russian Federation – Institute of Theoretical and Experimental Physics, city of Moscow
- Federal State Unitary Enterprise "Atomspetstrans" of the Federal Agency for Atomic Energy, city of Moscow
- Federal State Unitary Enterprise "Isotope", city of Saint-Petersburg
- Federal State Unitary Enterprise "All-Region Association "Isotope", city of Moscow
- Federal State Unitary Enterprise "Isotope", city of Yekaterinburg
- Federal State Unitary Enterprise Scientific and Technical Center for Radiation and Chemical Safety and Hygiene of the Federal Medical and Biological Agency, city of Moscow

- Federal State Unitary Enterprise State Scientific Center – Institute of Biophysics of the Federal Medical and Biological Agency, city of Moscow
- Federal State Establishment – Russian Scientific Center "Kurchatov Institute", city of Moscow
- State Unitary Enterprise of the city of Moscow – Joint Ecological and Technological and Scientific-Research Center for RW Deactivation and Environment Protection, city of Moscow
- Federal State Unitary Enterprise "Leningrad Specialized Combine "Radon", city of Sosnovij Bor, Leningrad region
- Federal State Unitary Enterprise "Volgograd Specialized Combine "Radon", city of Volgograd
- Federal State Unitary Enterprise "Nizhny Novgorod Specialized Combine "Radon", city of Nizhny Novgorod
- Federal State Unitary Enterprise "Grozny Specialized Radiation Safety Combine "Radon", city of Grozny
- Federal State Unitary Enterprise "Irkutsk Specialized Radiation Safety Combine "Radon", city of Irkutsk
- Federal State Unitary Enterprise "Kazan Specialized Radiation Safety Combine "Radon", city of Kazan
- Federal State Unitary Enterprise "Samara Specialized Combine "Radon", city of Samara
- Federal State Unitary Enterprise "Murmansk Specialized Radiation Safety Combine "Radon", city of Murmansk
- Federal State Unitary Enterprise "Novosibirsk Specialized Radiation Safety Combine "Radon", settlement of Prokudskoje, Kochenevsky district of Novosibirsk region
- Federal State Unitary Enterprise "Rostov Specialized Combine "Radon", city of Rostov-on-Don
- Federal State Unitary Enterprise "Saratov Zonal Specialized Combine "Radon", city of Saratov
- Federal State Unitary Enterprise "Sverdlovsk Specialized Radiation Safety Combine "Radon", city of Yekaterinburg
- Federal State Unitary Enterprise "Blagoveshchensk Specialized Combine "Radon", city of Blagoveshchensk, Republic of Bashkortostan
- Federal State Unitary Enterprise "Chelyabinsk Specialized Radiation Safety Combine "Radon", city of Chelyabinsk
- Federal State Unitary Enterprise "Khabarovsk Specialized Combine "Radon", city of Khabarovsk

Annex F2. Facility Category of Hazard

Classification of the facilities of potential radiation hazard, introduced by the normative document "Basic sanitary rules of assuring 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 sanitary-protective zone
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 works with radiation sources are performed

Annex G. Basic parameters of the storage facilities

Basic parameters of the storage facilities in Russia

Parameter	Storage facilities			Interim storage facilities		
	VVER		RBMK	BN	VVER	RBMK
	440	1000	1000	600	1000	1000
Capacity of the storage facility						
FA	600	400	1700	3885	770	17520
tons	72	165	190	80	330	1900
Number of vaults	2	2	2	3	8	5
Vaults dimensions, mm:						
length	10700	13520	10700	21475	6200	26600
width	4200	6210	4200	10000	4400	5600
depth	17520	16200	17520	7000	16400	11300
Structural volume of the facility, m^3	30000	45000	15926	24000	65100	64600