INOFFICIAL

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

Moscow 2008
This second 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 has been prepared by the State Atomic Energy Corporation “Rosatom” and Federal Environmental, Industrial and Nuclear Supervision Service with involvement of:

- Nuclear Safety Institute of the Russian Academy of Sciences (IBRAE RAS),
- Scientific and Engineering Center for Nuclear and Radiation Safety (SEC NRS).
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List of abbreviations

AMB — “atomic peaceful large” (an abbreviation for water-cooled, graphite-moderated channel-type thermal neutron reactor)
BN — fast neutron reactor
CA — Critical Assembly
CA — Controlled Area (see context)
CHMP — Open-type Joint Stock Company Chemical and Metallurgical Plant (or JSC CHMP)
Cl — Curie (activity unit of measure)
CMP — Open-type Joint Stock Company Chepetsky Mechanical Plant (or JSC CMP)
EGP — graphite loop-type power reactor
FA — Fuel Assembly
FL — Federal Law
FMB — Floating Maintenance Base
FR — Fuel Rod
FSUE — Federal State Unitary Enterprise
FTP — Federal Target Program
HLW — High Level Waste
HMP — Open-type Joint Stock Company Hydrometallurgical Plant
HWR — Heavy-Water Reactor
IAEA — International Atomic Energy Agency
ICRP — International Commission for Radiation Protection
ILW — Intermediate Level Waste
IPPE — Federal State Unitary Enterprise the Institute of Physics and Power Engineering named after A.I. Leipunsky (of FSUE SRC RF IPPE)
IR — Ionizing Radiation
IRS — Ionizing Radiation Source
LLW — Low Level Waste
LRW — Liquid Radioactive Waste
MCC — Federal State Unitary Enterprise Mining and Chemical Combine (or FSUE MCC)
MMC — Open-type Joint Stock Company Murmansk Shipping Company
MOE — Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Natural Disaster Consequences
NFC — Nuclear Fuel Cycle
NI — Nuclear Facility
NIIAR — Open-type Joint Stock Company the State Research Center of the Russian Federation – Research Institute of Atomic Reactors (or OJSC SRC RF NIIAR)
NM — Nuclear Materials
NPI — Nuclear Power Facility
NPIC — Nuclear Power and Industry Complex
NPP — Nuclear Power Plant
OJSC — Open-type Joint Stock Company
OSPORB — basic sanitary rules of radiation safety
PA Mayak — Federal State Unitary Enterprise Production Association Mayak (or FSUE PA Mayak)
PIMCU — Open-type Joint Stock Company Priargunsky Industrial Mining and Chemical Union
RBMK — uranium-graphite large capacity channel-type reactor
RF — Russian Federation
Rostechnadzor — Federal Environmental, Industrial and nuclear Supervision Service of Russia
RR — Research Reactor
RS — Radioactive Substances (see context)
RS — Radiation Source (see context)
RSS — Radiation Safety Standards
RTG — Radioisotope Thermoelectric Generator
RW — Radioactive Waste
SAR — Safety Analysis Report
SC Radon — Special Combine Radon
SCC — Open-type Joint Stock Company Siberian Chemical Combine (or JSC SCC)
SCR — Self-sustained Chain Reaction
SF — Storage Facility
SFA — Spent* Fuel Assembly
SNF — Spent* Nuclear Fuel
SRS — Sealed Radiation Source
SRW — Solid Radioactive Waste
TPP — Thermal Power Plant
WWER — water-cooled water-moderated power reactor

* termed "irradiated" in a number of regulations of the Russian Federation
Section A. Introduction

A.1. Purpose of the Report


The 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 National Report is focused on issues and problems highlighted by the Contracting Parties in the course of the review and discussion of national reports at the Second Review Meeting held in the IAEA (Vienna, Austria) on May 15-24, 2006.

The Second National Report does not include separate issues of compliance with articles of the Convention that were described in detail in the First National Report of the Russian Federation and have not changed over the period reported.

A.2. Structure of the Report

The report is formatted and structured in accordance with requirements of the Convention “Guidelines Regarding the Form and Structure of National Reports” (INFCIRC/604/rev.1).

The sections listed below describe how the obligations under the Convention are complied with.

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The Second Review Meeting of the Contracting Parties noted positive aspects of SNF and RW management practices in the Russian Federation, including:

- the compliance of the existing legal and regulatory basis for SNF and RW management, as well as the state regulatory system for the uses of atomic energy, to international standards;
- proper control of safety at SNF and RW management and safety of facilities for SNF and RW reprocessing and storage by the existing safety regulatory system, including conduct of activities in compliance with licenses granted by results of systematic and periodic safety assessments of operators and regulatory inspections;
- active work to draft the public law on RW management which is to establish legal and economic mechanisms supporting management of legacy and currently generated waste;
- functioning of the United State Database on Sealed RSs;
- international cooperation in storage and reprocessing of SNF from foreign reactors and Russian-made fuel.

It was noted that the specific factor determining the policy and practices of SNF and RW management in the Russian Federation is the presence of a significant amount of SNF and RW resulted from past national defense programs as well as the substantial financial constraints of the last decade and a half caused by the disintegration of the USSR. It was also noted that due to the lack of the state system for RW management and a national organization for RW management in Russia the responsibility for RW management was resting with several ministries and agencies.

The review of the National Report revealed the necessity to implement SNF and RW safety improvement measures, including:

- nation-wide comprehensive inventory taking of RW;
- adoption of a long-term SNF and RW management strategy;
- decisions to determine a status of the existing RW storage facilities and implementation of relevant measures to close, eliminate or reconstruct them basing on safety assessments of the existing SNF and RW storage facilities;
- development of RW reprocessing and conditioning capabilities;
- financial support of the completion of decommissioning of a number of reactors and safety ensurance of management of leaking SNF;
- decommissioning of radioisotope thermoelectric generators (RTGs).

The need was also noted to supplement the National Report with additional information, particularly, on RW resulted from uranium ore mining and processing, as well as release/discharge information.

Planned and currently implemented measures to improve safety at SNF and RW management which necessity was noted by the review of the First 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 are described in this Report sections: A.4.3, B.2.6, B.5, D.1.4, D.3, E.2.1.1, F.2.2, F.5, H.1.2.7, H.2.
A.4. Main Topics of the Report and Near-Term Initiatives to Ensure Safety of SNF and RW Management


Russia’s energy development strategy envisages the outrunning growth and increase of the nuclear share in the total energy generation. To ensure the expedite development of nuclear power the Russian Federation adopted the Federal Target Program “Development of Nuclear Power and Industry Complex of Russia in 2007-2010 and until 2015” (FTP “NEIC Development”), as approved by the decree of the Government of the Russian Federation No 605 of 06 October 2006.

The national policy of the Russian Federation in nuclear and radiation safety assurance is determined in the “Basics of the State Policy in the Field of Nuclear and Radiation Safety of the Russian Federation until 2010 and Beyond” (hereinafter, the State Policy Basics).

The goal of the state policy 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.


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

The target of expedite nuclear development necessitated changes in the state governance of the uses of atomic energy and in the organizational and legal structure of the nuclear power and industry complex of the Russian Federation.


The nuclear power and industry complex means federal state unitary enterprises and federal state entities governed by the state body for control over the use of atomic energy; other legal entities irrespectively of their form of ownership, which carry out activities in the field of use of atomic energy as described in Article 4 of the Federal Law “On the Use of Atomic Energy” No 170-FL of 21 November 1995; and the open-type joint stock company being established by the decree of the President of the Russian Federation as per Federal Law No 13-FL, Article 3, Part 1, para. 1, of 05 February 2008.

Joint Stock Company Nuclear Industry Energy Complex’s 100% of shares will be owned by the state.

The Federal Law No 317-FL of 01 December 2007 “On the State Atomic Energy Corporation “Rosatom”” established the State Corporation Rosatom (hereinafter, SC Rosatom) which incorporated JSC Nuclear Industry Energy Complex, organizations ensuring nuclear and radiation safety and carrying out fundamental research in the uses of atomic energy,

and scientific and educational institutions. SC Rosatom is expected to have full ownership rights in 2008-2009.

The Decree of the President of the Russian Federation No 369 of 20.03.2008 “On Measures for Establishing the State Atomic Energy Corporation” cancelled the Federal Atomic Energy Agency that had state control over the uses of atomic energy and transferred its functions to the State Corporation Rosatom.

In parallel with the adoption of the Federal Law “On the State Atomic Energy Corporation “Rosatom” changes were introduced to the Federal Law ”On the Use of Atomic Energy“ (No 170-FL of 21.11.1995) under which the state regulation of safety at the uses of atomic energy should be effected by respective federal executive bodies and State Corporation “Rosatom”.

The changes also cover the system and structure of the federal executive bodies which regulate safety at the uses of atomic energy. The Decree of the President of the Russian Federation “The Issues Related to the System and Structure of the Federal Executive Bodies” No 724 of 12 May 2008 transferred the Federal Environmental, Industrial and Nuclear Supervision Service to the jurisdiction of the Ministry of Natural Resources and Environment of the Russian Federation.


This Decree also transferred the functions related to legal normative regulation of safety in the field of use of atomic energy to the Ministry of Natural Resources and Environment of the Russian Federation. The Ministry also has the right to suspend and cancel decisions made by the Federal Environmental, Industrial and Nuclear Supervision Service and its chairman, if necessary.

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

The nuclear industry development strategy assumes that the development of nuclear power and nuclear power and industry complex is not possible without a comprehensive solution of issues associated with management of SNF and RW that has resulted from the past activities, is accumulating and will be generated in future.

Safety of SNF and RW management is the most important direction of FTP NRS.

The program provides for development of necessary infrastructure of SNF and RW management; stage-by-stage solving of problems related to the past activities through rendering safe the nuclear and radiation hazardous facilities; and reliable functioning of systems required for nuclear and radiation safety assurance and control.

According to the “Basics of the State Policy” and obligations under the Convention, a draft federal law “On the Radioactive Waste Management” was produced in 2008 and is under review by the state bodies. Draft concepts of federal laws “On the Spent Fuel Management” and “On the Decommissioning of Nuclear Facilities” have been also developed.
According to the draft laws, the Russian Federation is establishing a unified RW management system. The laws define main principles of the establishing and functioning of the RW management system.

Responsibility of the Russian Federation for ensurance of safety of the public and protection of the environment in the course of ultimate disposal of “legacy” radioactive waste and division of responsibilities for resulting RW management between the state and economic agents are some of main principles of establishing and functioning of the unified RW management system.

The draft law “On the Radioactive Waste Management” provides for setting up a new subject of the unified state system, i.e. the national operator for RW management. The national operator is to be established by the public authority exercising control in the field of RW management to plan, organize and conduct RW management activities, including its long-term storage and final isolation (disposal).

This draft law also foresees establishing of legal and economic mechanisms to support with sufficient funding the management of “legacy” waste and RW being generated.

Main provisions of the Law are covered in more detail in section E.

Therefore, the changes on the national policy of the Russian Federation as regards nuclear and radiation safety ensurance, including at SNF and RW management, are aimed at improving safety and meet obligations of the Russian Federation under the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management.
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 Russian Federation 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 on the Management of Spent Nuclear Fuel of the Ministry of the Russian Federation of Atomic Energy", "SNF is a valuable secondary feed for producing nuclear fuel components and a number of radioactive isotopes used in medicine, agriculture, and industry".

B.2. SNF Management Practices

The national policy of Russia of the SNF management based on the combination of controlled SNF storage and reprocessing has not sustained changes since the issue of the First National Report of the Russian Federation.

Main information on existing facilities and quantities of SNF at different enterprises in the Russian Federation is given below.

SNF inventory lists are given in section D.

B.2.1. Spent Nuclear Fuel of NPPs

As of 01.01.2008, Russia operates 31 nuclear power units with a total power capacity of 23,242 MW. Appendix B1 contains data on the current situation and accumulation projection for SNF of different reactor types.

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

- for WWER-440 and BN-600 SNF the storage is arranged in the at-reactor hold-up ponds and then shipped off from the plant site to a reprocessing facility;
for WWER-1000, RBMK-1000, EGP-6 and AMB SNF which is not reprocessable, it is stored in on-site storage facilities or in the centralized storage facility at MCC.

On NPP sites SNF is kept in at-reactor hold-up ponds (HP) as well as in hold-up ponds of separate storage facilities (SSF SNF and SF SNF). Leaking SFAs are kept in HP in separate shrouds.

B.2.1.1. SNF of WWER-440 Reactors

Russia operates 6 units with WWER-440 type reactors which produce 55.5 tons (uranium metal) of SNF annually. After the at-reactor hold-up during 3 to 5 years the WWER-440 SNF is shipped to RT-1 at PA Mayak for reprocessing.

B.2.1.2. SNF of WWER-1000 Reactors

Russia operates 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.

B.2.1.3. SNF of RBMK Reactors

Presently, 11 Russian RBMK-1000 type reactors are in operation. Annually, they produce 390 tons of SNF. The SNF is stored under water in at-reactor hold-up pools and separate SNF storage facilities. Today, over 11,000 tons of SNF are stored on NPP sites. A transition from wet to dry storage (up to 50 years) of SNF with related categorization is planned for.

Until present, the RBMK SNF has not been shipped off from NPP sites. The shipment will be arranged for after RBMK SFA cutting sections have been set up on the plants’ sites. The fuel receipt for dry storage at MCC is planned for.

SNF container storage facilities are constructed on RBMK sites with commissioning: at Kursk and Leningrad NPPs in 2008 and at Smolensk NPP in 2009.

B.2.1.4. SNF of BN-600 Reactor at Beloyarsk NPP

Annually, the BN-600 reactor produces 6.2 tons of SNF, which is held-up on site and then is sent to RT-1 for reprocessing. At present, the plant's hold-up ponds contain 35.9 tons of SNF.

B.2.1.5. SNF of AMB Reactors at Beloyarsk NPP

At Beloyarsk NPP the first and second AMB reactors were shutdown in 1981 and 1989, respectively. SNF is unloaded from the reactors and partially has been shipped off the plant territory; the remainder is placed in special dry tubes and kept in stationary hold-up ponds (190 tons of SNF in 4,994 SFAs) and in wet storage facility at PA Mayak (76 tons of SNF in 2,202 SFAs) (uranium metal).

B.2.1.6. SNF of EGP-6 Reactors at Bilibino NPP

Bilibino NPP includes four similar power units with EGP-6 reactors (water-graphite heterogeneous channel-type reactor). A total mass of SNF is 164 tons (4,600 SFAs) with no leaking or damaged SFAs.

B.2.2. SNF of Ship Nuclear Facilities and Their Support Facilities


The nuclear icebreaker SNF is temporarily 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) was put into operation. Nuclear icebreaker SNF 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.

**B.2.3. SNF of Research Reactors (RR)**

There are 38 RRs in Russia, of which 21 are in operation, 2 are under refurbishment, 2 are under care and maintenance, 11 are being decommissioned, and 2 are under construction. The RR spent nuclear fuel has been partially reprocessed at RT-1. Some SNF has not been reprocessed and accumulated in temporary storage facilities at research centers with plans to ship it off to PA Mayak for reprocessing under the FTP NRS.

The scheduled repatriation of RR SNF of Russia (soviet) origin continues. By present, SNF has been repatriated from RR of the Academy of Sciences of the Republic of Uzbekistan, RR of the Nuclear Research Institute Rez in the Czech Republic, RR in Salaspils in the Republic of Latvia, and RR in the Republic of Bulgaria. The repatriation of RR SNF from the Republic of Hungary is planned to accomplish by the end of 2008.

**B.2.4. SNF of Foreign Reactors**

Outside Russia there are (were) in operation NPPs with reactor facilities of WWER-1000 and WWER-440 types as well as research reactors 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 present 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, the Czech Republic, Latvia and Bulgaria.

The WWER-1000 reactor fuel is shipped to the MCC storage facility, and WWER-440 and RR reactor fuel is taken to PA Mayak for reprocessing.

**B.2.5. SNF Reprocessing and Storage at NFC Enterprises**

In the Russian Federation WWER-440, BN-600 and propulsion reactors’ SNF is reprocessed at RT-1 of PA Mayak.

The plant has been in operation since 1977; its production capacity is 400 tons per year. The plant reprocesses SNF of power reactors WWER-440 of Russian NPPs and those built to Russian designs abroad, as well as SNF of BN-600 reactor, propulsion reactors of nuclear icebreakers and RRs.

The aqueous extraction technique used at PA Mayak for SNF reprocessing is similar to traditional PUREX-process.
Two Rosatom’s combines (MCC and PA Mayak) include pool-type storage facilities to keep SNF from Russian NPPs and nuclear propulsion facilities with capacities of 6,000 and 2,500 tons, correspondingly.

At MCC, WWER-1000 spent nuclear fuel is stored in the wet storage facility commissioned in 1986. At present, a SNF dry storage facility is constructed at MCC with its phase one to store RBMK SNF and be commissioned in 2010.

B.2.6. Measures under FTP NRS

FTP NRS focuses to a great extent on improvement of SNF management safety. The Program tasks in the field of SNF management include the development of SNF management capacities at nuclear facilities and implementation of innovation technologies.

At the first stage (2008-2010) it is planned to:

- refurbish the wet storage facility for WWER-1000 SNF at MCC to increase its capacity up to 8,600 tons;
- build the dry storage facility for SNF at MCC with a storage capacity adequate to meet current needs of nuclear power;
- create a scientific and methodological base and elements of infrastructure for the state systems of SNF and RW management.

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

- complete construction of the SNF dry storage facility at MCC;
- create a pilot demonstration center (PDC) for SNF reprocessing that would use innovation technologies at MCC (in view of building a SNF reprocessing plant with a capacity from 1,500 tons per year on the PDC basis);
- off-shipment of SNF accumulated in NPP on-site storage facilities to MCC.

It is also planned to solve priority tasks to eliminate problems associated with past activities, including work packages related to SNF management and off-shipment of accumulated quantities of SNF from research reactor sites.


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 aggregative state RW is divided into liquid, solid and gaseous waste.

LRW includes 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 Annex P-2 to NRB-99) when absorbed with water.

SRW includes 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 Annex P-4 to NRB-99, and if 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.
GRW includes 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 Annex P-2 to NRB-99.

In terms of specific activity the liquid and solid radioactive waste is classified 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**

<table>
<thead>
<tr>
<th>Waste category</th>
<th>Specific activity, Bq/kg (Bq/l)</th>
<th>β- and γ-emitters</th>
<th>α-emitters (excluding transuranic)</th>
<th>Transuranic</th>
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<tr>
<td>Low level</td>
<td>less than $10^6$</td>
<td>less than $10^5$</td>
<td>less than $10^4$</td>
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<td>Intermediate level</td>
<td>from $10^6$ up to $10^{10}$</td>
<td>from $10^5$ up to $10^9$</td>
<td>from $10^4$ up to $10^8$</td>
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</tr>
<tr>
<td>High level</td>
<td>more than $10^{10}$</td>
<td>more than $10^9$</td>
<td>more than $10^8$</td>
<td></td>
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**B.4. Radioactive Waste Management Policy**

The safety ensurance at RW management is one of the most important constituents of the national security and a binding condition of the use of atomic energy at present and in future.

The Russian Federation state policy in the field of the RW management provides well-directed activities to prevent adverse radiation impacts on humans and environment at all stages of the waste management (generation, collection, transportation, reprocessing, storage, and ultimate isolation), as well as to encourage organizations (RW producers) to transfer waste to specialist organizations for reprocessing or ultimate isolation.

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 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.

**B.5. Radioactive Waste Management Practices**

The current RW management practices 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, and spent RS, which are kept at PA Mayak and SCC. This waste is located in specialized buildings or structures and isolated from the environment (Annex B2). Three NFC enterprises inject low-level and medium-level short-lived LRW into deep reservoir beds in geological formations.
Until 2008 there has been a network of regional special combines Radon, which normally received low- and intermediate-level RW from organizations which operate IRS and RS. The Radon enterprises reprocessed RW and stored it in the long-term. Some NFC enterprises also used to transfer RW being generated to the Radon combines. The Decree of the President of the Russian Federation of 20.03.2008 signed away Radon combines to the State Corporation Rosatom (except for MosNPO Radon). At present they have been merged into a single public enterprise; its reforming plans are being developed.

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

Further details on RW management facilities that are under design, planned and operated is given in section D, with RW management safety issues covered in section H.

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. FTP NRS also envisages massive works towards safety assurance at RW management and nuclear and radiation hazardous facilities decommissioning.

The following measures are foreseen:

- urgent works to ensure safety of shutdown nuclear and radiation hazardous facilities, including at PA Mayak, MCC, SCC and other entities;
- construction, refurbishment and expansion of RW management capacities;
- construction of an underground laboratory for ultimate isolation of high-level RW;
- development of a scientific and methodological basis and infrastructure elements of the state systems for SNF and RW management, control and accounting of radioactive substances and RW, radiation monitoring and emergency response systems;
- integrated engineering-radiation and radiation-hygienic inspections of shutdown nuclear facilities, storage facilities and other facilities of nuclear legacy; pre-design and design works to render these facilities in the condition that ensures long-term environmental safety.

A facility to isolate high-level and long-lived RW in deep geological formations is planned to establish at MCC to implement the entire RW management cycle. At present, the declaration of intention regarding the facility has been developed.
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 radioisotopes and that does not originate from NFC unless it 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.

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

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

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

Major SNF management facilities are described below.

D.1.1. SNF Management at NPPs

As of 01.01.2008, Russia operates 31 nuclear power units with a total power capacity of 23,242 MW. The on-site SNF storage facilities store 12,478 tons of SNF, including 11,470 tons of RBMK SNF.

SNF of RBMK and EGP reactors is stored at NPP in the on-site storage facilities.

SNF of WWER-1000 reactors is kept in at-reactor hold-up ponds and after three years of storage is taken to the centralized wet storage facility at MCC.

The SNF of WWER-440 and BN-600 reactors is kept in the at-reactor hold-up ponds and after three or more years of storage is taken to PA Mayak.

SNF of shutdown AMB reactors at Beloyarsk NPP is stored on site (4,994 SFAs) and at PA Mayak (2,202 SFAs).

Tables B1.1 and B1.2 of Appendix B1 provide data on placement and quantities of SNF of different reactor types, as of 01.01.2008. Largest quantities of SNF are at PA Mayak and MCC.
D.1.2. Research Reactor SNF Management

Research reactor SNF has been partially reprocessed at RT-1 plant. Some part of SNF has not been reprocessed and is accumulated in temporary storage facilities of research centers. The temporary storage facilities of research centers keep about 90 tons of SNF under controlled storage.

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

D.1.3. SNF Management at PA Mayak

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

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

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

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

D.1.4. SMF Management at MCC

The WWER-440 SNF storage at MCC is arranged in the wet storage facility commissioned in 1986.

The storage facility design capacity is 6,000 tons with regard to uranium. The work is underway to expand the capacity up to 8,600 t.

At present, MCC has about 4,700 tons of SNF under controlled storage.

In frames of FTP NRS, it is planned to refurbish the wet storage facility for WWER-1000 SNF at MCC.

In 2009 it is planned to commission a start-up complex of the dry storage facility designed for 5,000 tons of RBMK and WWER-1000 SNF; full capacity of the storage facility is 29,000 tons of RBMK and AMB SNF and 15,000 tons of WWER-1000 SNF.

FTP NRS provides for development of the pilot demonstration center for SNF reprocessing that will use innovation technologies at MCC.

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

The Russian Federation has accumulated about 18,750 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 Annex B1.

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

The SNF of the civilian nuclear fleet is stored on technical support ships of FSUE Atomflot.

FMBs Lotta and Imandra store 674 shrouds (13 cores) with unreprocessible uranium-zirconium SNF.

The FMB Lepse, which is not in operation, stores 639 SFAs.
D.3. RW Management Facilities (Article 32 (iii))

At present, over 90 facilities for reprocessing of different types of RW (listed in Table B.1.3 of Annex B) are in operation (commercial or pilot).

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

The facilities of highest reprocessing capacity include:

- **Re-melting** Ecomet-S (SRW, LLW; 2,000 tons/year),
- **Vitrification** FSUE PA Mayak (LRW, HLW; 300-500 l/h)
  - SUE MosNPO Radon (LRW, ILW; 200 l/h),
- **Incineration** SUE MosNPO Radon
  - (LRW ILW; 20 l/h; SRW ILW; 60 kg/h)

At NPP, a standard facility (LRW, SRW, ILW; 255 m³/year)

The most exhaustive equipment sets are at:

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

Recently, a number of new facilities have been commissioned.

In December 2006, after the scheduled shutdown of the third HLW vitrification furnace EP-500/3 that had started earlier the same year, the fourth LRW vitrification furnace EP-500/4 at PA Mayak’s RT-1 was started up that was followed by the run using real solutions already in March 2007. The fourth HLW vitrification capacity is 500 l/h of LRW.

In 2007 a SRW reprocessing complex was accepted for pilot operation at Kalinin NPP. The complex is located within the plant industrial plot and includes sections for SRW reprocessing and storage.

The following have been also commissioned:

- LRW cementation facility at Volgodonsk NPP;
- LRW ion-selective clean-up facility at Kola NPP;
- smelting furnaces complex at Kursk NPP.
Over 30 more facilities are at different development stages (design, laboratory tests, and mock-up fabrication).

A set of new facilities for RW conditioning and reprocessing are planned to implement at nuclear power plant, including facilities for:

- ion-selective clean-up of LRW: Leningrad NPP (2008), Kursk NPP (2008), Volgodonsk NPP, Smolensk NPP, Novovoronezh NPP, Kalinin NPP (2010);
- plasma incineration of RW: Novovoronezh NPP (2008);
- decontamination of ion exchange resins: Leningrad NPP, Kursk NPP, Balakovo NPP, Smolensk NPP, Novovoronezh NPP, Kalinin NPP (2010-2012);
- clean-up of special laundry water: Kalinin NPP, Smolensk NPP, Balakovo NPP (2010–2012);

FTP NRS plans for large-scale activities to design and manufacture RW management facilities, including:

- development of a complex for cementation of liquid and heterogeneous intermediate-level LRW; a VLLW clean-up facility; a complex for SRW reprocessing at PA Mayak;
- development of a combined sewerage system at PA Mayak;
- construction of a facility for disposal of organic LRW at SCC etc.

A substantial amount of work is envisaged by FTP NRS as to develop new and refurbish existing RW storage facilities, including:

- construction of new storage facilities:
  - long-term storage facility for solidified RW in mining tunnels at MCC;
  - SRW above-surface storage facilities at a number of Radon combines with a total storage capacity of over 10,000 cubic meters (Saratov, Sverdlovsk, Leningrad, Novosibirsk, Kazan, Khabarovsk, Samara, Nizhniy Novgorod, Blagoveshchensk);
  - SRW storage facility of 4,500 cubic meters in capacity at SUE of the city of Moscow - the Joint Ecological, Technological and Research Center for Neutralization of Radioactive Waste and Environmental Protection;
- refurbishing of more than 15 facilities and sites for RW storagerеконструкция более 15 объектов и полигонов хранения РАО, as well as 5 storage facilities at Radon combines;
- construction of first priority facilities for final isolation of RW (Krasnoyarsk Territory, Nizhne-Kansky Rock Mass);
- activities to change conditions of storage and treatment for disposal of SRW being in responsibility of FSUE Atomflot (Murmansk);
- activities to ensure care and maintenance and carry out environmental rehabilitation of tail dumps.

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

As of the end of 2007, a total of over 476 mln m³ (4.37·10¹⁹ Bq) of LRW and 82 mln t of SRW (1.68·10¹⁹ Bq) have been accumulated.
D.4.1. RW Generation and Reprocessing

The RW generation sources are:
- mining and processing of radioactive ores;
- processing of NM, fabrication of nuclear fuel;
- electricity generation at NPPs;
- SNF reprocessing and storage;
- use of NM, RS and ionizing radiation sources (IRS) in industry, medical institutions, research institutes etc.

Over recent three years, an average annual amount of RW generation is (in 2007, see Table B2.1, B2.2):
- 4.0 mln m$^3$ of LRW with a total activity of $1.7\cdot10^{18}$ Bq, of this low-level waste comprises 94.0% of the total amount with activity of $5.7\cdot10^{18}$ Bq; intermediate-level waste (5.65% - $3.0\cdot10^{17}$ Bq; and high-level waste 0.35% - $1.33\cdot10^{18}$ Bq(a reduction of activity as compared with previous three years is due to features of the fuel being reprocessed);

Over recent three years, an average annual amount of RW generation is (in 2007, see Table B2.1, B2.2):
- more than 1 mln t of SRW, of which 99.2% in terms of mass is low-level waste of ore processing; its total activity is $2.23\cdot10^{14}$ Bq or 0.6% in terms of activity of all SRW being generated.

In addition, the reprocessing of high-level LRW at PA Mayak produces annually on average some 600 tons of secondary vitrified waste with a total activity of about $1.38\cdot10^{18}$ Bq.

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

Assessments have demonstrated that of the quantity of RW accumulated by the present time up to 20% is originated from NPPs with the remainder major fraction resulted from NFC enterprises. The latter circumstance is conditioned by features of radiochemical processes.
The aqueous extraction technologies they are using produce about 10 m³ of high-level; 190 m³ of intermediate-level; and 3,000 m³ of low-level of LRW while reprocessing of 1 ton of NPP SNF (with regard to uranium).

In 2007 nuclear industry enterprises reprocessed about 3.8 mln m³ of LRW and 6,000 t of SRW.

**D.4.2. RW Placement and Storage**

Main bulks of RW are placed in 1,466 temporary storage facilities and 3 disposal facilities (under continuous monitoring) in deep geological formations at 136 enterprises located in 43 regions of Russia.

The major fraction of LRW (97.1%) accumulated at nuclear industry enterprises is low-level RW with activity of $7.07 \times 10^{15}$ Bq (about 0.02% of the total activity of LRW), of which 88.7% is in the storage facilities (special reservoirs and storages at PA Mayak and SCC).

A large amount of intermediate-level LRW (85%) is consolidated at SCC, MCC, NIIAR and is isolated from the environment in deep geological formations.

High-level LRW represents less than 0.01% of a total amount of LRW; its activity is about 47% of the total activity of LRW. All high-level LRW is isolated from the environment.

Of 81.4 mln t SRW accumulated at nuclear industry enterprises the main bulk is low-level RW and over 95% of such waste is at ore mining and processing enterprises (PIMCU (73%), GMP (18%) and CMP (4.6%).

At the same time, the main bulk of activity (99.3%) is represented by high-level SRW which mass is about 66,700 tons and which is reliably isolated from the environment.

The accumulated high-level RW is predominantly vitrified waste, fuel rod cladding, metal waste contaminated with radionuclides, equipment, SRS that exhausted its assigned service life, including RTGs.

This waste is kept in specialized buildings and is isolated from the environment.

**D.4.3. SRS and RTGs**

SRS, which have exhausted their service lives, are an additional source of RW. According to the state control and accounting of radioactive substances and RW data, an annual generation of such RW is 55,000-60,000 items.

In coming 50 years service lives of all RTGs (over 500) expires in the Russian Federation; all of them are subject to decommissioning.

The State Corporation Rosatom has developed a work procedure related to RTG decommissioning and timeframes when this should be accomplished.

**D.4.4. Activities to Render RW Environmentally Safe**

At present, storage facilities that are not isolated from the environment host about 10% (in terms of activity) of intermediate-level LRW accumulated as a result of the past defense programs.

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

FTP NRS also plans for massive works to render safe the LRW storage facilities that are not isolated from the environment.
D.5. Decommissioning of Nuclear Facilities (Article 32 (v))

At present, four nuclear power units, 11 research reactors and one nuclear fuel cycle enterprise (CHMP) are in preparation for decommissioning and in the process of decommissioning in the Russian Federation.

A list of facilities being decommissioned is given in Table B1.4 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 SNF and RW management legislation of the Russian Federation allows, to a great extent, meeting the obligations resulting from the Convention provisions.

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 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.

E.2.1. Legislative and Regulatory Framework
Activities in the field of SNF and RW management are regulated on the basis of the Constitution of the Russian Federation, international agreements and conventions (including the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, the Convention on Nuclear Safety, the Vienna Convention on Civil Liability for Nuclear Damage, the Vienna Convention on Early Notification of a Nuclear Accident, the Convention on Physical Protection of Nuclear Material and other), federal laws of the Russian Federation, regulatory 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, normative acts by the state safety regulatory authorities in the field of use of atomic energy, regulations by other state safety regulatory authorities and bodies controlling uses of atomic energy, state and industry-wide standards, and technical regulations.

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

Federal norms and rules establish binding requirements for all legal entities and physical persons carrying out activities in the of use of atomic energy and are applicable within the entire territory of the Russian Federation.

The safety of SNF and RW management is regulated also basing on safety guides and guiding documents issued by the state safety regulatory authorities, documents issued by the state bodies for control over the uses of atomic energy (institutional documents), state and industry-wide standards.

E.2.1.1. Federal Laws

The Federal Law “On the Use of Atomic Energy” (No 170-FL of 21.11.1995) is the fundamental document which is aimed at environmental protection, protection life and health of people and determines the legal basis for:

- legal regulation principles in the field of the use of atomic energy;
- jurisdiction, rights and authorities of all parties of the legal regulation in the field of use of atomic energy (RF President and Government, state and local bodies, organizations and citizens, state bodies for control and state safety regulatory bodies regarding the use of atomic energy);
- the legal status of organizations which use atomic energy; it establishes the responsibilities and obligations of the operating organization as regards safety assurance of a nuclear facility, radiation source and storage facility;
- it establishes principles and a procedure for licensing of the uses of atomic energy;
- a decision-making procedure as regards siting and construction of nuclear facilities, radioactive sources and storage facilities, and their decommissioning;
- it defines the state policy in the field of nuclear material, radioactive substances and RW management along with basic provisions of management of nuclear material, radioactive substances and RW;
- it establishes responsibilities for losses and harm caused by radiation impact to legal entities and physical persons, health of the citizens, and liability for violation of the legislation of the Russian Federation in the field of use of atomic energy;
- it establishes principles and a procedure for export and import of nuclear facilities, equipment, technologies, nuclear material, radioactive substances, special non-nuclear material, and services in the field of use of atomic energy;
- it establishes provisions for meeting international obligations of the Russian Federation in the field of use of atomic energy, information exchange with foreign states as related to the use of atomic energy.
The law (Article 44) stipulates that the state policy in the management of nuclear material, radioactive substances and RW should provide for an integrated solving of issues related to regulation of production, generation, use, physical protection, collection, recording and accounting, transportation and storage thereof.

The law Articles 45 through 47 stipulate that in the course of transportation, storage and processing of nuclear material, radioactive substances and radioactive waste the reliable protection of nuclear facility workers, general public and environment should be ensured against radiation impact and radioactive contamination that is impermissible in accordance with norms and rules in the field of use of atomic energy.

The Federal Law “On the Use of Atomic Energy” Article 5 stipulates that nuclear material (including RW containing nuclear material) and nuclear facilities can be owned both by the state and legal entities. A list of Russian legal entities which can own nuclear material (including RW containing nuclear material) or nuclear facilities is subject to approval by the President of the Russian Federation. Owners of nuclear facilities and nuclear material should exercise control over their security and proper utilization. Nuclear material, irrespectively of a form of ownership, is subject to the state nuclear material control and accounting.

Federal Law “On the Radiation Safety of the Public” (No 3-FL of 09 January 1996). The law defines the legislative bases of radiation safety ensuance of the population to protect their health. The law establishes main principles of the radiation safety ensuance, 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.

Federal Law “On the Sanitary and Epidemiological Well-Being of the Public” (No 52-FL of 30 March 1999). The law defines the legislative bases of the ensuance 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, and soil.

General sanitary and epidemiological requirements for storage and disposal of production and consumption waste are stipulated in the law Article 22. According to the law Article 27, the storage and disposal of radioactive substances, materials and waste is allowed provided sanitary and epidemiological statements are in place that confirm that handling conditions of sources of physical factors affecting humans (ionizing radiation) are in conformance with sanitary rules.

Federal Law “On the Environmental Protection” (No 7-FL of 10 January 2002). The law defines the legislative bases of the state policy in the field of environmental protection. The law establishes main principles of the environmental protection, permissible norms of impacts to the environment, including limits for the production waste placement.

In regard to RW and SNF, the Law sets forth the following norms:

- it prohibits importation for storage, disposal, or neutralization of RW from foreign states, as well as its dumping and disposal in outer space (Articles 48, 51);
- it prohibits discharge of production and consumption waste, including RW, in surface and ground water, catchment areas, into and on soil (Article 51);
● it prohibits placement of RW in certain territories where danger may arise for the environment, natural ecological systems and human health (Article 51);
● the SNF importation to the Russian Federation from foreign states for temporary technological storage and (or) reprocessing is permitted if a reduction of general risk of radiation impact and improvement of environmental safety owning to implementation of a corresponding project is justified, considering the prevailing right of return of the RW resulted from the reprocessing to the SNF state of origin or provide for such return (Article 48);
● stipulates the binding nature of the state environmental review and identifies objects of such review.

**Federal Law “On the Environmental Review”** (No 174-FL of 23 November 1995). 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.

The environmental review is defined by the law as the establishing of conformance of a planned economic or other activity to environmental requirements and the determining whether an activity subject to the environmental review is permissible to implement as aimed at prevention of possible adverse impacts of this activity to the environment and related social, economic and other consequences of implementation of the activity subject to environmental review.

**Federal Law “On the Protection of the Public and Territories against Natural and Man-Induced Emergencies”** (No 68-FL of 21 December 1994). The law defines organizational and legislative norms in the field of 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.

**The Water Code of the Russian Federation** (No 74-FL of 03 June 2006)/ The law regulates the use and protection of water bodies (surface and ground) which are owned by the state, municipality or privately.

**Article 56** of the law imposes limits on the use of water bodies as follows:
● discharge to water bodies and disposal thereof of production and consumption waste... is prohibited;
● disposal of nuclear material, radioactive substances in water bodies is prohibited;
● discharge to water bodies of effluent water where the content of radioactive substances... and other substances and compounds hazardous for human health exceeds permissible limits of impacts to water bodies is prohibited.

Therefore, the law prohibits disposal of RW in water bodies but does not prohibits discharge of radioactive substances by establishing requirements that the content of radioactive substances in discharge water should not exceed permissible limits.

For reference: water reservoirs of a number of NFC enterprises are so-called industrial reservoirs which were created in the time period of expedite implementation of defense programs. Their status and operation are regulated by special decrees of the Government of the Russian Federation and Rostechnadzor’s license conditions.

**The Law of the Russian Federation “On Subsoil Resources”** (No 2395-1 of 21 February 1992) contains a norm that directly regulates the issues of deep geological disposal of
RW (which includes disposal of RW in deep geological layers). The law Article 10 stipulates that the legal basis to obtain the right to use subsoil environment for the purposes of disposal RW in deep geological layers, which ensures confinement of such waste, can be a decision by the Government of the Russian Federation as coordinated with executive bodies of the RF federal subjects.


The Criminal Code of the Russian Federation establishes liability for a violation of safety rules at nuclear facilities which could incur or incurred a human death or radioactive contamination of the environment (Article 215), as well as for a violation of rules of management of radioactive substances and waste (Article 247).

The Code of the Russian Federation on Administrative Violations establishes liability for a violation of rules of the use of atomic energy and accounting of nuclear materials and radioactive substances (Article 9.6); for non-licensed entrepreneurship (Article 14.1); for the failure to timely observe an improvement notice issued by a state regulatory authority (an official) (Article 19.5); as well as for the failure to follow environmental, sanitary and hygienic requirements for management of waste or other hazardous substances (Article 8.2); for concealment of information or provision of false information on the radiation situation (Article 8.5). In addition, the Code defines authorities of regulatory officials as regards reviews of administrative violations pertaining to the said types.

Federal Law “On Special Environmental Programs for Rehabilitation of Contaminated Sections of Territories” (No 92-FL of 10 July 2001) defines features of the state regulatory practices as regards the development and implementation of special environmental programs for rehabilitation of sections of territories contaminated with radiation. The law stipulates that special environmental programs are funded with hard currency proceeds resulted from foreign trade operation with SNF. The SNF-related foreign deals are concluded by an organization especially authorized by the Government of the Russian Federation only provided a positive statement of the state environmental review is granted.

Federal Law “On Financing of Specially Radiation and Nuclear Hazardous Productions and Facilities” (No 29-FL of 3 April 1996) includes a norm that secures budget funding of works to ensure safe and sustainable functioning of specially radiation and nuclear hazardous productions and facilities. The law Article 3 includes the norm binding the organizations, which operate specially radiation and nuclear hazardous productions and facilities, to secure centralized funds to finance activities aimed at advancement of technologies and improvement of safe functioning of the said facilities.

Federal Law “On Technical Regulation” (No 184-FL of 27 December 2002) stipulates that binding requirements for safety of products, processes, operation, storage, transportation can be set forth only by technical regulations which are adopted by a federal law or a decree by the President of the Russian Federation or a decree of the Government of the Russian Federation.

The law was amended on 01 May 2007, in particular, a new revision of the law Article 5 was introduces to stipulate that with regard to products and objects subject to requirements for nuclear and radiation safety assurance at the uses of atomic energy, along with requirements of the technical regulations, should be subject to mandatory requirements set forth
by the bodies for the state control and regulation of safety at the uses of atomic energy. Therefore, the new revision of the Federal Law No 184-FL Article 5 retains the binding nature of requirements of the federal norms and rules in the field of use of atomic energy.

**Federal Law “On the State Atomic Energy Corporation “Rosatom”” (No 317-FL of 01 December 2007)** has established the State Corporation that included JSC Nuclear Power Industry Complex, organizations pertaining to the nuclear complex, organizations which ensure nuclear and radiation safety and carrying out basic research in the field of use of atomic energy, and scientific educational establishments. The Corporation is formed and operates to promote the state policy; execute the legal regulatory practices; render services on the state level and manage the state property associated with the uses of atomic energy; develop and ensure safe functioning of entities within the nuclear power and industry complex and nuclear weapons complex of the Russian Federation; ensure nuclear and radiation safety, non-proliferation of nuclear materials and technologies; develop nuclear science, technology and professional education; and carry out international cooperation in this field. The RF Presidential Decree No 369 of 20.03.2008 transferred the authorities of the Federal Atomic Energy Agency to the State Corporation Rosatom.

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 (Annex E) represent the legislative basis for regulating safety during transboundary movements of nuclear materials (including spent nuclear fuel), radioactive substances and radioactive waste.

At the present time, a draft Federal Law **“On Radioactive Waste Management”** has been prepared. The drafting and adoption of this law is envisaged in the “Basics of the State Policy of Nuclear and Radiation Safety Ensurance in the Russian Federation until 2010 and Beyond” signed by the RF President 04.12.2003, and listed as one of main tasks of the state policy as regards nuclear and radiation safety ensurance.

According to the said draft document, a unified state system for RW management is planned to create for the purposes of implementation of the state policy in the field of the RW management in the Russian Federation.

The main objective of the unified state system for RW management is to ensure safe and economically effective RW management which allows for reliable isolation of all accumulated and being generated RW to protect the public and environment until the waste loses its hazardous or adverse properties.

Main subjects of the unified state system for RW management are:

- the state body for control over RW management and the state nuclear safety regulatory authorities;
- the national operator for RW management – the organization created by the state body for control over RW management to plan, organize and execute RW management activities, including long-term storage and final isolation (disposal);
- RW generators;
- Specialist organizations for RW management.

Main principles of establishing and functioning of the unified state system for RW management are:
• responsibility bound by the Constitution of the Russian Federation for ensuring safety of the public and protection of the environment at RW management;
• absolute priority of protection of human life and health, present and future generations, biological resources and environment against adverse impacts of RW in the course of uses of atomic energy;
• final isolation (disposal) of RW to render accumulated activity environmentally safe;
• creation of a system of administrative, engineering and technological and other barriers that exclude release of RW beyond the RW management infrastructure;
• provision of sufficient resources to RW management, including those for control and monitoring followed the closure of facilities for final isolation (disposal) of RW;
• division of responsibilities for RW management between the state and economy subjects;
• provision, by the RW generator, of funding of the entire cycle of management of RW resulting from operations, including its final isolation (disposal);
• creation of conditions for forming a competitive service market, attracting investments and developing public-private partnership in the field of RW management;
• provision of economic incentives to minimize generation of RW and optimize RW management.

To provide for financial support of RW management, the draft law envisages creating a special fund to cover RW management expenditures; the fund is built up of regular payments by RW generators. The payment size is determined by the body controlling RW management depending on amounts and categories of RW being generated.

A list of main legal and other regulatory acts covering RW and SNF management is given in Appendix E.

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

In elaboration of provisions of the Federal Law “On the Use of Atomic Energy”, as well as other federal law related to the uses of atomic energy, the President of the Russian Federation and the Government of the Russian Federation adopt legal normative act termed as decrees of the President of the Russian Federation and decrees of the government of the Russian Federation.

12 May 2008 the President of the Russian Federation signed Decree No 724 “The Issues Related to the System and Structure of the Federal Executive Bodies”. This decree has made the Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) reportable to the Ministry of Natural Resources and Environment of the Russian Federation.

In accordance with the Federal Law “On the Use of Atomic Energy”, the Government of the Russian Federation approved the “Provisions for Licensing of Activities in the Field of Use of Atomic Energy” (the RF Governmental Decree No 865 of 14.07.1997) that defines activities in the field of use of atomic energy which implementation is possible only on the basis of permits (licenses) granted by the relevant state safety regulatory authorities. These activities include also handling of RW in the course of its storage, reprocessing, transportation and disposal. Further details of the Provisions are given in para. E2.2.

Appendix E of the National Report contains a list of by-laws applicable to the area in question.
The procedure for importation of irradiated nuclear assemblies of nuclear reactors to the Russian Federation is defined in the Decree of the Government of the Russian Federation No 418 of 11 July 2003 “On the Procedure of Importation of Irradiated Fuel Assemblies of Nuclear Reactors to the Russian Federation”, which stipulates that the importation of irradiated nuclear assemblies to the Russian Federation is carried out provided the positive environmental review statement on the unified project is in place prepared by authorized organizations and coordinated with the State Corporation Rosatom and Rostechnadzor and provided the authorized organizations have relevant licenses issued by the Ministry of Economic Development and Trade of the Russian Federation and Rostechnadzor.


Appendix E of the National Report contains a list of by-laws applicable to the area in question.

Thus, the changes in the Russian legislation that have taken place since the First National Report are evolutionary in nature and comply with obligations undertaken by Russia under the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management.

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

According to Decree of the Government of the Russian Federation No 1511 of 01 December 1997 “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”, federal norms and rules establish requirements for the safe use of atomic energy, including requirements for nuclear, radiation, industrial and fire safety, physical protection, and control and accounting of nuclear material, radioactive substances and RW. Federal norms and rules are developed by state safety regulatory authorities and/or bodies which control the uses of atomic energy in accordance with their jurisdiction. 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, marine nuclear-propulsion facilities, research reactors, industrial enterprises, including scientific and medical establishments).

A list of main federal norms and rules applicable to the area in question is given in Annex E of the National Report.
Main federal norms and rules establishing nuclear and radiation safety requirements for SNF and RW management are described below.

E.2.1.3.1. State Sanitary and Epidemiological Rules, Norm and Hygienic Standards

State Sanitary and Epidemiological Rules, Norm and Hygienic Standards, which are subject to approval by the Chief Sanitary Officer of the Russian Federation, establish criteria of safety and (or) harmlessness for humans of their environment and mandatory requirements a failure to meet which creates threat to human life or health.

The Radiation Safety Standards (NRB-99) SP 2.6.1.758-99 are the fundamental document which regulates compliance with the requirements set forth in the Federal Law “On the Radiation Safety of the Population” through main dose limits and permissible levels of impact to humans. These standards apply to ensure safety of humans under any conditions of exposure to artificial or natural ionizing radiation.

In elaboration of provisions of NRB-99, the Basic Sanitary Rules of Radiation Safety (OSPORB-99) SP 2.6.1.799-99 were adopted, which contain requirements for protection of humans against adverse radiation impacts under all conditions of exposure to ionizing radiation sources subject to NRB-99 in the course of design, construction, operation, refurbishment and decommissioning of radiation facilities.

The Sanitary Rules of Radioactive Waste Management (SPORO-2002) SP 2.6.6.1168-02 establish requirements for radiation safety ensurance of the personnel and population at all types of RW management. The Rules contain basic principles of its handling, radiation safety criteria for RW management, and basic requirements for ensuring safety of the personnel and population at all stages of RW management: collection, storage, transportation, reprocessing and disposal of RW both at nuclear power enterprises and other organizations where RW is generated.

In 2007 the Federal Medical and Biological Agency developed and had approved by the Chief Sanitary Officer the sanitary rules listed below:

- Radiation Safety Insurance at Decommissioning of a Nuclear Power Unit SP 2.6.1.2205-07;
- Controlled Areas and Surveillance Zones of Radiation Facilities. Operating Conditions and Justification of Boundaries SP 2.6.1.2216-07.

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

According to Decree of the Government of the Russian Federation “On the Ministry of Natural Resources and Environment of the Russian Federation” No 404 of 29.05.2008, the Ministry of Natural Resources and Environment of the Russian Federation was transferred the jurisdiction over development of the state policy and execution of the legal regulation of safety of the uses of atomic energy. Rostechnadzor and State Corporation Rosatom participate in development of federal norms and rules in the field of use of atomic energy. The Ministry of Natural Resources and Environment of the Russian Federation is the body for approval of federal norms and rules.

Federal norms and rules in the field of use of atomic energy are developed on the basis of legal regulatory acts of the Russian Federation, the Convention of Nuclear Safety, the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, and considering the IAEA safety standards.
Federal norms and standards are developed as general provisions, norms and rules (requirements).

**General Provisions** establish nuclear and radiation safety principles, criteria and general requirements for a nuclear facility (nuclear power plant, NFC facility, radiation source, NM and RW storage facility, research facility etc) at all stages of its life cycle (siting, construction, commissioning, operation and decommissioning, including during accidents and elimination of their consequences, as well as at SNF and RW management). Documents such as NP-001-97, NP-016-05, NP-038-02, NP-033-01 and the like pertain to this category.

**Norms and Rules (Requirements)** establish requirements for either a certain activity or separate parts of a nuclear facility, systems, and components.

Safety issues specific for SNP reprocessing facilities are regulated by the “Facilities for Reprocessing of Spent Nuclear Fuel. Safety Requirements (NP-013-99)” which establishes principles, criteria and requirements aimed at safety ensuring at design, construction, commissioning, operation and decommissioning of SNF reprocessing facilities (SNF of power and research reactors and propulsion reactors).

Safety issues specific for SNF dry storage facilities are regulated by the “Spent Nuclear Fuel Storage Facilities. Safety Requirements (NP-035-02)” which establishes safety requirements for design, construction, commissioning, operation and decommissioning of SNF dry storage facilities.

Requirements for taking account of external events of natural and man-induced origin in siting, design, construction, operation and decommissioning of nuclear facilities are established in the “Accounting of External Natural and Man-Induced Events to Nuclear Facilities (NP-064-05)” which covers natural and man-induced processes, phenomena and factors to be revealed by surveys and studies in the nuclear facility location region and on site and taken account of in justification of its stability and safety.

The document **Requirements for Quality Assurance Program** establishes requirements for composition and content of quality assurance programs for nuclear facilities, radiation sources, storage facilities and activities related to SNF and RW management at all stages of life cycle (NP-011-99, NP-041-02, NP-056-04 and others).

The **Provisions on Event Investigation and Recording Procedures** (NP-004-08, NP-047-03 etc.) define the procedure for investigation and recording of events at nuclear facilities, categories of violations, the procedure for event information reporting, as well as requirements for investigation reports.

The **Requirements for Content of the Personnel Emergency Protection Action Plan** (NP-015-2000, NP-077-06 etc.) for different nuclear facilities, radiation sources and storage facilities establish basic requirements for drafting action plans for protection of the personnel in the event of an accident, the procedure for effecting these action plans, measures to protect the personnel in the event of an accident, actions of the operating personnel and facility administration if normal operation of the facility is violated, and determine how the work to eliminate consequences of emergencies should be organized.

The document **Requirements for Justification of Extension of the Assigned Service Life of Nuclear Facilities** (NP-024-2000) establishes main safety criteria and requirements as regards a possibility of extending service life of nuclear facilities beyond the assigned operating period and getting a Rostechnadzor’s license to operate the facility during the extended period.
The Safety Rules for Decommissioning of Nuclear Facilities (NP-057-04, NP-012-99, NP-028-01 etc) establish requirements for safety ensurance during decommissioning of nuclear facilities, radiation sources, storage facilities, their decommissioning program, comprehensive engineering and radiation survey, as well as the decommissioning project.

The following norms and rules regulate safety at RW management:


The NP-058-04 establishes safety goals and principles of RW management, as well as general safety requirements.

Safety ensurance principles at RW management established by this document include:

- ensurance of an acceptable level of protection of workers (personnel) against radiation impact from RW in accordance with principles of justification, optimization and dose limitation (the principle of protection of human health);
- ensurance of an acceptable level of protection of the environment against adverse impact of RW (the principle of protection of environment);
- consideration of interdependencies among all steps of RW generation and management (the principle of interdependency among all steps of RW generation and management);
- projected exposure levels due to RW disposal should not exceed permissible exposure levels established by existing documents for the population (the principle of protection of future generations);
- avoidance of imposing unnecessary burdens to future generations associated with the necessity to ensure safety at RW management (the principle of avoiding burdens to future generations);
- RW generation and accumulation should be kept to the minimum practicable (the principle of control over RW generation and accumulation);
- prevention of accidents with radiation consequences and mitigation of possible consequences if such accidents have taken place.

“Safety Rules of Radioactive Waste Management of Nuclear Power Plants (NP-002-04)” establish safety principles and requirements for management of RW of nuclear power plants, which are possible sources of radiation impact to workers (personnel), population of environment.


The NP-055-04 establishes principles, criteria and basic safety requirements for near-surface disposal of RW and RW disposal in deep geological formations.

“Safety Rules in Transportation of Radioactive Material (NP-053-04 and NP-061-05)” establish basic technical and administrative requirements for systems for storage and transportation of nuclear material, RS and RW, including SNF, and aimed at safety assurance during storage and transportation of nuclear material, RS and RW at nuclear facilities.

Also, Rostechnadzor has developed a set of documents which establish requirements for contents of safety analysis reports for nuclear facilities, radiation sources, SNF and RW storage facilities (NP-051-04, NP-066-05, NP-006-98, NP-039-02 and other). These regulations contain requirements for the procedure of drafting a safety analysis report, its formatting and information content as regards justification of safety at different stages of their life cycle: siting, design, construction, commissioning, operation and decommissioning.

Since the First National Report the Federal Environmental, Industrial and Nuclear Supervision Service, independently and jointly with other federal executive bodies and competent authorities, has developed a set of new and revised a set of existing norms and rules to ensure consistency of the established regulatory requirements to the current level of science and technology considering both the Russian and international expertise in the uses of atomic energy.

“Near-Surface Disposal of Radioactive Waste. Safety Requirements (NP-069-06)” has been developed taking account of the IAEA recommendations in Safety Series WS-R-1 “Near Surface Disposal of Radioactive Waste”.

NP-069-06 elaborates on and specifies requirements of federal norms and rules NP-058-04 and NP-055-04 as regards safety assurance at near-surface disposal of radioactive waste.

“Rules of Categorizing Nuclear Material as Radioactive Waste (NP-072-06)” establish requirements for a set of measures related to placing under the RW category of products which are not further usable, writing off the state accountancy of the NM contained therein and writing in the state accountancy of NM-containing RW resulted from these products.

In addition, Rostechnadzor has developed and put into force the following federal norms and rules in the field of use of atomic energy:

- Requirements for Planning and Preparedness to Eliminate Consequences of Accidents During Transportation of Nuclear Materials and Radioactive Substances (NP-074-06);
- Facilities for Immobilization of Transuranic Radioactive Waste. Safety Requirements (NP-076-06);
- Requirements for Contents of an Action Plan to Protect the Personnel in the Event of an Accident at a Nuclear Fuel Cycle Enterprise (NP-077-06);
- Provisions for the Procedure to Declare Alert and Emergency and Prompt Information in the Event of Radiation Hazardous Situations at Nuclear Fuel Cycle Enterprises (NP-078-06);
- Requirements for Planning of Actions and Protection of Workers (Personnel) in the Event of Radiation Accidents at a Ship Nuclear Facility and (or) other Waterborne Vehicle (NP-079-06).

A list of federal norms and rules, as well as a list of revised federal norms and rules since the First National Report of the Russian Federation is given in Appendix E.
E.2.1.4. Guiding Documents and Safety Guides of RosTechnadzor

**Guiding documents** contain organizational norms which establish rules and procedures for this or other activity within the RosTechnadzor’s jurisdiction.

In particular, guiding documents define requirements for the composition of documents required to justify nuclear and radiation safety of nuclear facilities, radiation sources and SNF and RW storage facilities; requirements for their contents; procedure for verification of credibility of data contained in the documents submitted for licensing; as well as review procedure (RD-05-15-2002, RD-03-13-99 and other).


**Safety guides** establish acceptable for RosTechnadzor ways and methods of meeting the requirements of federal norms and rules and determine required sequence of actions and circumstances of such actions. If an organization applies other ways and methods to meet relevant requirements of federal norms and rules, it should submit justifications of chosen way and methods of meeting the requirements.

A list of guiding documents and safety guides developed and effected by the Federal Environmental, Industrial and Nuclear Supervision Service is given in Appendix E.

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

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 Code of the Russian Federation on Administrative Violations" No 195-FL 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.

The licensing procedure and conditions for the atomic energy uses are established by the "Provisions for Licensing of Activities in the Field of Atomic Energy" (as approved by Decree of the Government of the Russian Federation No 865 of 14.07.1997).

A list of activities related to this Convention includes:

- siting, construction, operation and decommissioning of nuclear facilities, radiation sources and nuclear material and radioactive substance storage facilities and radioactive waste storage facilities;
- management of nuclear materials and radioactive substances, including during exploration and mining of uranium ores, production, use, reprocessing, transportation and storage of nuclear material and radioactive substances;
- management of radioactive waste during its storage, reprocessing, transportation and disposal;
- the use of nuclear material and/or radioactive substances in research and development;
- design and engineering of nuclear facilities, radiation sources and nuclear material and radioactive substance storage facilities and RW storage facilities;
• design and manufacture of the equipment for nuclear facilities, radiation sources and nuclear material and radioactive substance storage facilities and RW storage facilities;

• expert review of the design, engineering and process documentation as well as the documents which justify nuclear and radiation safety of nuclear facilities, radiation 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 "On the Federal Environmental, Industrial and Nuclear Supervision Service (as approved by Decree of the Government of the Russian Federation "Regarding the Federal Environmental, Industrial and Nuclear Supervision Service" No 401 of 30.07.2004), the Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) licenses activities in the field of use of atomic energy.

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), organizations responsible for carrying out inspections in the course of Rostechnadzor's licensing reviews (RD-03-43-98, RD-05-02-2003, RD-07-13-2001 and other).

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 facility or storage facility of the federal or interregional significance is carried out by the Headquarters, and the facilities of regional significance are licensed by the Rostechnadzor's regional offices.

In the course of review of a license application for an activity in the field of use of atomic energy Rostechnadzor arranges for and conducts an inspection to check on the applicant's preparedness for the conduct of a given activity and to verify credibility of the information presented in the safety justification documents. A decision on granting a license or refusing to grant it is made considering results of the said inspections.

When reviewing a package of documents justifying nuclear and radiation safety of a nuclear facility, radiation source, storage facility and/or declared activity, Rostechnadzor analyzes:

• whether the design, engineering and technological solutions comply with federal norms and rules in the field of use of atomic energy; whether the competence of workers complies with the established requirements and there are conditions to maintain it at the required level; as well as whether a system for RW collection, storage, reprocessing and disposal during conduct of the declared activity is in place and compliant with the established requirements;

• completeness of technical and administrative measures for nuclear and radiation safety assurance during conduct of the declared activity;

• whether there are adequate conditions for storage, control and accounting of nuclear material, radioactive substances and RW, and physical protection of nuclear facilities, radiation sources, storage facilities, nuclear materials and radioactive substances, RW storage facilities;

• action plans to protect workers of the nuclear facility and public in the event of an accident and preparedness to implement them, as well as the quality assurance system and necessary engineering and technical support of the declared activity;
• ability of the applicant to safety terminate the declared activity and decommission the nuclear facility, as well as whether the related project materials are in place.

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 SNF and RW management.

If earlier unknown circumstance related to safety of the activity being licensed are revealed when new federal norms and rules in the field of use of atomic energy are put into force, Rosstehnadzor may require the applicant to provide additional documents justifying safety of the activity being licensed and make a decision as to amend the license conditions.

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

E.2.3.1. Institutional Control

The institutional supervision and control over SNF and RW 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 facility, radiation source or storage facility.

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.

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.

E.2.3.2. Regulatory Control

The state supervision over safety of the uses of atomic energy means activities of the state safety regulatory authorities and their regional offices which includes receipt and analysis of safety related information, organization and conduct of inspections, decision-making, and imposing sanctions if violations of safety requirements for the uses of atomic energy are revealed. In accordance with its authorities the Rosstehnadzor 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.).
According to Decree of the Government of the Russian Federation No 401 of 30.07.2004, the Rostechnadzor controls and supervises over:

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

Rostechnadzor’s regional offices include structural divisions – inspection offices – which supervise over the uses of atomic energy in organizations and enterprises of the nuclear industry. These divisions are staffed with inspectors of appropriate specialties who have necessary authority and carry out regular state supervision over safety of all nuclear facilities, radiation sources and SNF and RW storage facilities.

Annually, Rostechnadzor writes inspection plans for both the representatives of regional offices (targeted, operative) and representatives of the Headquarters of Rostechnadzor (comprehensive and targeted).

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

The procedure for exemption of an activity from the regulatory control is described in the First National Report of the Russian Federation and has not sustained any changes over the period reported.

E.2.3.3. Documentation and Reporting

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

According to the FL "On the Use of Atomic Energy” and federal norms and rules in the field of use of atomic energy, Rostechnadzor should receive information from the state bodies and operating organizations:

- on the radiation situation and its changes basing on results of the state-level radiation monitoring in the territory of the Russian Federation;
- on events affecting nuclear and radiation safety of nuclear facilities, and their consequences;
- on safety of nuclear facilities;
- presence and movements of nuclear material, radioactive substances and RW, as well as of export and import thereof.

The said information should include an analysis which identifies causes and circumstances of violations of safety requirements and determines effectiveness of measures being undertaken by operating organizations to prevent breach of safety requirements, as well as causes and circumstances led to such a breach.

A reporting procedure regarding operational events and safety reports of nuclear facilities is established by Rostechnadzor.
All information and nuclear facility safety reports received are subject to registration and processing by relevant structural divisions of Rostechnadzor’s Headquarters and regional offices. A procedure for the information processing and analysis, its objectives and specific measures to be taken basing on its results are established in the Rostechnadzor’s guiding documents.

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 facility and storage facility.

The operating organization must transfer the information about events at a nuclear facility 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.2.4. Enforcement of Applicable Regulations and of the Terms of Licenses
(Article 19-2(v))

According to 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.

According the applicable legislation of the Russian Federation and provisions for the federal Environmental, Industrial and Nuclear Supervision Service, the latter’s official have the right to:

- suspend or terminate licenses granted by Rostechnadzor and its regional offices to organizations (legal entities) for declared nuclear activities if they conduct such activities with violations of nuclear and radiation safety requirements or terms of the said licenses;
- prohibit the use of equipment and technologies which do not comply with nuclear and radiation safety requirements;
- impose official reprimands, as warnings and fines, on organizations (legal entities) and officials for violations of norms and rules in the field of use of atomic energy;
- file to law enforcement bodies the documents on violations of the Russian Federation legislation in the field of use of atomic energy, requirements of federal norms and rules in the field of use of atomic energy, license (permit) conditions, which have elements of crime, as per the criminal legislation of the Russian Federation.

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 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;
- the finding of incorrect information in documents submitted to get the license;
- breaching of the license conditions by the license holder;
- 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;
- 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.
The federal law “The Code of the Russian Federation on Administrative Violations” 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 Code also 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 disaster, substantial damage to the environment.

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

Principles of regulation of the uses of atomic energy are established in the Federal Law “On the Use of Atomic Energy”. The law outlines jurisdictions, rights and authorities of different parties thereof and establishes responsibilities of the operating organization as regards ensurence of safety of a nuclear facility, radiation source and storage facility.

According to provisions of the Federal Law “On the Use of Atomic Energy”, the jurisdiction of the bodies which control the uses of atomic energy includes:

- conduct of the state scientific, technical, investment and organizational policy in the field of use of atomic energy;
- development of measures to ensure safety of the uses of atomic energy;
- generation and implementation of RW management programs.

Decree of the Government of the Russian Federation No 412 of 03 July 2006 “Regarding the Federal Executive Bodies Exercising the State Control over the Uses of Atomic Energy and the State Regulation of Safety of the Uses of Atomic Energy” defines the following bodies for the state control over the uses of atomic energy (as regards the Convention):

- Federal Atomic Energy Agency (presently, the State Corporation Rosatom),
- Federal Agency on Industry (Ministry of Industry and Trade of the Russian Federation, as per Decree of the RF President No 724 of 12.05.2008),
- Federal Agency for Marine and River Transport,
- Federal Agency on Education,
- Federal Science and Innovations Agency,
- Federal Energy Agency (Ministry of Energy of the Russian Federation, as per Decree of the RF President No 724 of 12.05.2008),
- Federal Agency for Construction and Public Utilities (Ministry of Regional Development of the Russian Federation as per Decree of the RF President No 724 of 12.05.2008, as regards the management of low- and intermediate-level RW and ionizing radiation sources outside the nuclear, power and military complexes of the country),
- Federal Agency for Public Health and Social Development (Ministry of Public Health and Social Development of the Russian Federation, as per Decree of the RF President No 724 of 12.05.2008),
- Federal Agency for Subsoil Resources Management,
- Federal Agency for Technical regulation and metrology (as per Decree of the RF Government No 160 of 15.03.2007),
• Federal Medical and Biological Agency (as per Decree of the RF Government No 423 of 02.06.2008).

The Federal Law of the Russian Federation “On the “Rosatom” established the State Corpora-
tion Rosatom, SC Rosatom, (http://www.minatom.ru) which incorporated JSC Nuclear Industry
Energy Complex, organizations ensuring nuclear and radiation safety and carrying out funda-
mental research in the uses of atomic energy, and scientific and educational institutions.

All issues related to the management of SNF and RW being generated by regular operations
of enterprises within the State Corporation Rosatom, including issues of security and nonpro-
liferation, planning, construction and operation of SNF and RW management facilities and
facilities, are in jurisdiction of the State Corporation Rosatom.

Therefore, the State Corporation Rosatom controls activities of enterprises that generate
over 90% of SNF and RW.

Activities of other enterprises which generate SNF and RW are controlled by other ministries
and agencies listed above, correspondingly.

The state bodies and administration of the RF federal subjects are also involved in decision-
making regarding development of SNF and RW reprocessing facilities, SNF and RW storage
facilities.

The draft law “On the Radioactive Waste Management” also establishes the status and au-
thorities of different RW management stakeholders and defines the right of ownership of RW
and the procedure for transfer of relevant rights from one stakeholder to another.

**E.3. Regulatory Bodies (Article 20)**

*Article 20. Regulatory Body*

20-1 Each Contracting Party shall establish or designate a regulatory body entrusted with the implementa-
tion 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 func-
tions where organizations are involved in both spent fuel or radioactive waste management and in
their regulation.

**E.3.1. 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 implementa-
tion 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.

The Federal Law “On the Use of Atomic Energy” No 170-FL of 21.11.1995 stipulates that the
state regulation of safety at the uses of atomic energy envisages activities of corresponding
federal executive bodies aimed at developing, approving and putting into force norms and
rules in the field of use of atomic energy; issuing permits (licenses) for the right to operate
in the field of use of atomic energy; supervising the safety; conducting reviews and inspec-
tions; controlling the development and implementation of measures to protect workers of
nuclear facilities, population and environment in the event of an accident in the course of the use of atomic energy.

In parallel with the adoption of the Federal Law “On the State Atomic Energy Corporation "Rosatom"” a change was made to Article 23 of the Federal Law “On the Use of Atomic Energy” (от 21.11.1995 г. № 170-ФЗ), under which the state regulation of safety at the uses of atomic energy should be executed by relevant federal executive bodies and State Corporation Rosatom.

Article 24 of the Law stipulates that the state regulation of safety at the uses of atomic energy is executed by federal executive bodies, i.e. the state safety regulatory bodies which regulate nuclear, radiation, industrial and fire safety.

Decree of the Government of the Russian Federation No 412 of 03.07.2006 stipulates that the state regulation of safety at the uses of atomic energy is carried out by:

- Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor);
- sanitary and epidemiological supervision bodies (Federal Consumer Rights and Human Well-Being Supervision Service, Federal Medical and Biological Agency);

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 of the state safety regulatory bodies 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.

**Federal Environmental, Industrial and Nuclear Supervision Service**

According to Decree of the Government of the Russian Federation No 401 of 30.07.2004, the Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor) is a federal executive body which:

- controls and supervises over safety of the uses of atomic energy;
- controls and supervises over compliance with industrial safety requirements;
- controls and supervises over environmental protection (as regards limitation of adverse man-induced impacts);
- organizes and conducts state environmental reviews at the federal level.

In 2008 in the Russian Federation changes were introduced in the structure and authorities of the federal executive bodies, including substantial changes to the authorities and responsibilities of the Federal Environmental, Industrial and Nuclear Supervision Service. The RF Presidential Decree “The Issues Related to the System and Structure of the Federal Executive Bodies” No 724 of 12 May 2008 transferred the Federal Environmental, Industrial and Nuclear Supervision Service to the jurisdiction of the Ministry of Natural Resources and Environment of the Russian Federation.

For the purposes of the RF Presidential Decree No 724 of 12.05.2008, the Government of the Russian Federation approved the Decree “Provisions on the Ministry of Natural Resources

and Environment of the Russian Federation” No 404 of 29 May 2008 and relevant amend-
ments to the Decree of the Government of the Russian Federation “On the Federal Environ-
mental, Industrial and Nuclear Supervision Service” No 401 of 30.07.2004, under which the
Federal Environmental, Industrial and Nuclear Supervision Service is a body for licensing ac-
tivities, control and supervision over safety in the field of use of atomic energy.

According to the Decree of the Government of the Russian Federation No 404 of 29 May
2008, the Ministry of Natural Resources and Environment of the Russian Federation (Minpri-
rody of Russia) is a federal executive body which develops the state policy and executes the
state legal normative regulation of safety at the uses of atomic energy (except for the activi-
ties related to development, manufacturing, testing, operation and disposal of nuclear wea-
pons and military nuclear power installations).

According to these changes, Minprirody of Russia is assigned the functions of adoption of
federal norms and rules in the field of use of atomic energy as per the Russian Federation
legislation.

In addition, Minprirody of Russia has the authority to establish requirements for the content
and composition of documents related to safety ensurance of nuclear facilities, radiation
sources, nuclear material and radioactive substances storage facilities, radioactive waste sto-
rage facilities and (or) current activities in the field of use of atomic energy, which are ne-
cessary for licensing activities in this field, as well as the procedure for reviewing such doc-
uments.

According to the Decree of the RF Government “Provisions for the Federal Environmental,
Industrial and Nuclear Supervision Service” No 401 of 30.07.2004, Rostechnadzor has the
following authorities to:

- control and supervise over:
  - compliance with norms and rules in the field of use of atomic energy; with conditions
    of permits (licenses) to operate in the field of use of atomic energy;
  - nuclear, radiation, industrial and fire safety (at nuclear facilities);
  - physical protection of nuclear facilities, radiation sources, nuclear material and radia-
    tion substances storage facilities, systems for the unified state control and accounting
    of nuclear materials, radioactive substances and radioactive waste;
  - meeting international obligations of the Russian Federation as regards safety ensur-
    ance in the uses of atomic energy;
  - compliance, within its jurisdiction, with requirements of the Russian Federation legisla-
    tion as regards radioactive waste management;
  - timely return of irradiated fuel assemblies of nuclear reactors and their reprocessing
    products to the supplying state (within its jurisdiction);
- license activities in the field of use of atomic energy;
- organize and conduct the state environmental review at the federal level;
- grant permits to work in nuclear industry to workers of nuclear facilities;
- grant permits for releases and discharges of contaminants into the environment;
- carry out checks (inspections) of compliance by legal entities and physical persons of re-
  quirement of the Russian Federation legislation, legal regulatory acts, norms and rules in
  the field of use of atomic energy;
● coordinate qualification handbooks of positions of heads and specialists subject to qualification requirements as employees who need to get permits to work in the field of use of atomic energy;

● coordinate lists of radioisotopic products which exportation and importation does not need licensing;

● arrange for and support functioning of a nuclear facility emergency monitoring/control system (emergency response);

● as a constituent of the unified state system for prevention and elimination of emergencies, command activities of functional subsystems of control over nuclear and radiation hazardous facilities;

● within its jurisdiction, carry out necessary investigations in the set forth area of activity;

● apply constraints, precautions and preventive measures, as provided by the Russian Federation legislation, aimed at barring and (or) suppression of violations by legal entities and physical persons of mandatory requirements in the set forth area of activity, as well as measures to eliminate consequences of the said violations.

General rules of how the Rostechnadzor’s activities are organized are set forth by the “Regulation of the Federal Environmental, Industrial and Nuclear Supervision Service” No 724 of 24 July 2006.

In its activities Rostechnadzor employs the quality assurance system developed in accordance with the “Provisions for the Quality Assurance System of the Federal Environmental, Industrial and Nuclear Supervision Service in the Field of State Supervision over Safety of the Uses of Atomic Energy” (RD-03-29-2008) which is aimed assuring quality and effectiveness of Rostechnadzor’s performing functions of state regulation of safety of the uses of atomic energy. The Rostechnadzor’s quality assurance system takes account of provisions of international standards ISO 9000 Series and IAEA recommendations.

The Federal Environmental, Industrial and Nuclear Supervision Service exercises its functions through the Headquarters and regional offices (including interregional nuclear and radiation safety offices) set up in accordance with the established procedure. The organizational structure of the Headquarters and regional offices of Rostechnadzor (with number of staff) is given on the website: http://www.gosnadzor.ru.

The Headquarters and regional nuclear and radiation safety offices of Rostechnadzor have the personnel of required qualifications which are subject to requirements of the Federal Law “On the Civil Service” No 79-FL of 27 July 2004, Decree of the President of the Russian Federation No 1131 of 27 September 2005, and other regulations.

Rostechnadzor’s specialists are professionally trained in accordance with RD-20-06-2008 “Provisions for Professional Training of Employees of the Federal Environmental, Industrial and Nuclear Supervision Service”.

The Rostechnadzor’s system includes two technical support organizations for nuclear and radiation safety: the Federal State Entity Scientific and Engineering Center for Nuclear and Radiation Safety (SEC NRS) (http://www.secnrs.ru) and the Federal State Unitary Enterprise VO Safety (http://vosafety.ru), which render scientific and technical support to Rostechnadzor as regards the regulation of nuclear and radiation safety.

Rostechnadzor has concluded agreements with other safety regulatory bodies regarding division of authorities of safety regulation in the field of use of atomic energy.
According to 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 performs functions related to the state sanitary and epidemiological supervision over compliance with sanitary legislation.

According to Decrees of the Government of the Russian Federation No 206 of 11.04.2005 and No 423 of 02.06.2008, the **Federal Medical and Biological Agency (FMBA of Russia)** is a federal executive body which performs, among other, the functions of control and supervision in the area of sanitary and epidemiological well-being of workers of organizations of certain industries featuring hazardous labor conditions and the population of certain territories on the list which subject to approval by the Government of the Russian Federation, including health and hygienic care of workers of the subject organizations and population of the subject territories. The said list includes all organizations of the State Corporation Rosatom.

The Federal Medical and Biological Agency performs the assigned functions of sanitary and epidemiological supervision (control) directly or through its regional offices (interregional and regional offices).

Radiation monitoring of labor conditions of workers at subject nuclear facilities, including in the course of SNF and RW management, and radiation safety of the population in the certain territories is carried out by industrial hygiene laboratories (radiation hygiene laboratories) and in-house radiation monitoring laboratories which are parts of hygiene and epidemiology centers of FMBA of Russia.

According to 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** carries out the state supervision in the area of protection of the public and territories against natural and man-induced emergencies.

**E.3.2. 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 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 President of the Russian Federation No 1304 of 11.10.2004).

According to the Federal Law "On the Use of Atomic Energy", activities of the state safety regulatory authorities are financed out of the federal budget.
Section F. Other General Safety Provisions

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

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

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

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

According to Article 34 of the Federal Law "On the Use of Atomic Energy", the operating organization must have authorities, financial, material and other resources sufficient for carrying out designated functions.

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 NI, RS and SF 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 NI, RS and SF;
- the development and implementation of measures to prevent accidents at NI, RS and SF and mitigate their adverse consequences for NI, RS and SF employees, population and environment;
- the security of rights of the nuclear facility employees for social and economic compensations;
- the accounting of individual exposure doses of the employees of nuclear facilities;
- the development and implementation, within its jurisdiction, of measures to protect the employees and public in the event of an accident at NI, RS and SF;
- the development and implementation of fire safety measures;
• the radiation monitoring in the controlled area and surveillance zone;
• the liability for nuclear damage.

The license holder is made fully responsible for:
• the nuclear and radiation safety;
• the development and implementation of measures to improve safety at SNF and RW management;
• radiological protection of the personnel, public and environment;
• the financial coverage of civil liability for nuclear damage.

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

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))

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

In accordance with requirements established by the federal norms and rules in the field of use of atomic energy NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-02, the operating organization which manages SNF and RW and other radioactive materials must provide for:

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

• recruitment, training and maintaining of the required competence of the nuclear facility employees;

• 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 facility;

• a permit to work system to allow the employees of the required competence to perform permitted activities;
regular emergency drills to master the employees’ actions in the event of operational events, including accidents, and accounting of lessons learned from previous accidents and errors;

building the employees’ safety culture.

According to conditions of licenses granted by Rostechnadzor, 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 assurance;

- 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 facility 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.

Rostechnadzor has developed guides on supervision over how the required level of competence is maintained of the employees who operate a nuclear facility or storage facility (RD-04-28-97, RD-03-19-2007, RD-03-20-2007, RB-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, as well as they participate in the work of qualification commissions set up at enterprises.

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

The State Corporation 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 SC Rosatom’s activities.

As of 01.01.2008, SC Rosatom had under its jurisdiction 4 higher education and 3 secondary professional education institutions funded from the Federal budget as well as 5 advanced training institutions.

The SC Rosatom’s personnel are educated in 22 educational institutes reporting to the Rosobrazovanie.

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

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

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

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

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

The procedure for financing works performed at radiation and nuclear hazardous productions and facilities in the amount required for safe and sustainable functioning of these productions and facilities is established in the Federal Law “On Financing of Specially Radiation and Nuclear Hazardous Productions and facilities” No 29-FL of 03 April 1996.

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

According to the “Provisions for Licensing of Activities in the Field of Use of Atomic Energy” (the RF Governmental Decree No 865 of 14.07.1997), to get a Rostechnadzor’s license, the applicant must provide documents which confirm that the funding sources for decommission-
ing of nuclear facilities, radiation sources or storage facilities, including a special fund to finance costs related to decommissioning these facilities, and to finance research and development to improve safety of these facilities, are available to the applicant.

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

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

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 disposal of the radioactive waste being generated or held on temporary storage.


The State Corporation Rosatom will manage special reserve funds to maintain safety of SNF and RW management facilities to last through their service lives and those for their decommissioning; these funds are to include:

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

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

FTP NRS provides for a massive financing of measures to ensure nuclear and radiation safety at SNF and RW management. A total amount of funding under FTP NRS out of the federal budget will be about RUR132bn. Some of measures envisaged by this program are given in section B.
F.3. Quality Assurance (Article 23)

According to Article 35 of FL “On the use of Atomic Energy”, the operating organization is responsible for organizing and coordinating the drafting and implementation of quality assurance programs at all stages of development, operation and decommissioning of a nuclear facility, radiation source and storage facility. Therefore, when managing SNF and RW, the operating organizations and those that perform the activities and provide the services must assure their quality at all stages of development, operation and decommissioning of the facility through proper implementation of the quality assurance programs.

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

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

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

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

The availability of a quality assurance program and its implementation plan are the compulsory requirements for validity of licenses granted by Rostechnadzor. Rostechnadzor reviews quality assurance issues in the course of inspections at enterprises and organizations which carry out activities in the field of use of atomic energy.

Russia’s nuclear industry pays much attention to promotion of international standards for quality management system - ISO 9000. As of 2006, the following entities were certified against ISO 9000:

- FSUEs – VNIIA, DalRAO, KB ATO, Combiner ECP, NIIS, PA Sever, NIIT;
At present, the environment monitoring systems, as per standard ISO 14000, have been implemented at JSC AECC, JSC MSZ, JSC NCCP, JSC CMP and Balakovo NPP.

**F.4. Operational Radiation Protection (Article 24)**

*Article 24. Operational Radiation Protection*

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

i) the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;

ii) no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection; and

iii) measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.

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

i) to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and

ii) so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.

24-3 Uncontrolled and Unplanned Releases

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

In the Russian Federation, radiation protection of the personnel of nuclear installations (NI), radiation sources (RS) and storage facilities (SF) and the public is regulated by the following main documents:

- Federal Law “On the Use of Atomic Energy”;
- Radiation Safety Standards (NRB-99);
- Basic Sanitary Rules of Radiation Safety (OSPORB-99);
- General Safety Provisions (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-058-04, NP-038-02);
- other rules and norms in the field of use of atomic energy.

These documents reflect internationally acknowledged principles of radiation safety and take account of recommendations of the International Commission for Radiation Protection, including the IAEA Safety Series No 110 “Safety of Nuclear Installations” and No 115 “Basic Safety Standards” etc.

The Federal Law “On the Use of Atomic Energy” stipulates that a controlled area and surveillance zone are to be established for the purposes of population protection near the site of a
nuclear facility, radiation source or storage facility. In addition, the operating organization should ensure:

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

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

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

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

- for the public – an average annual effective dose is equal 0.001 Sv or effective dose over the life period (70 years) is equal to 0.07 Sv; it is permissible at certain years to have higher values of the effective dose (less than 0.005 Sv) provided the average annual effective dose calculated over five sequential years will not exceed 0.001 Sv;
- for the personnel – an average annual effective dose is equal to 0.02 Sv or an effective dose over the labor period (50 years) is equal to 1 Sv; the exposure to an annual effective dose up to 0.05 Sv is permissible provided the average annual effective dose calculated over five sequential years will not exceed 0.02 Sv.

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

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

Federal norms and rules (NRB-99, OSPORB-99, NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-02) stipulate that the administration of NI, RS and SF should ensure accounting of exposure doses of the personnel and outsourced employees, as well as should
develop and implement measures to reduce the personnel exposure to a reasonably achievable level.

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

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

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

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

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

An annual average exposure dose to the personnel of nuclear power and industry enterprises, on the whole, and SC Rosatom’s enterprises in particular (bracketed values) is, respectively: 2005 – 2.28 (1.95), 2006 – 2.24 (1.91), 2007 – 2.10 (1.83) mSv.

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

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

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

In the event of an unanticipated or uncontrolled release of radioactive substances into the environment in excess of the established limits the operating organization must undertake measures to identify the cause of release and bring the facility back to normal operation. Operational events at NI, RS and SF, including accidents, are subject to investigation with the results submitted to the regulatory body for review.
The following arrangements have been made functional in Russia: the Unified State System for Monitoring and Accounting for Exposure Doses to the Population of the Russian Federation (ESKID), the Unifies State Automated Radiation Monitoring System in the Russian Federation (EGASKRO), the Radiation and Hygienic Certification System for facilities that use ionizing radiation sources and for territories if the Russian Federal Subjects.

In 2005-2007, gaseous and aerosol releases and water discharges of radionuclides from nuclear enterprises were within the established limits. No accidents which consequences could adversely affect the environment were reported. A further reduction of the man-induced impact to the environment (within the established guidelines) took place.

A total activity of radionuclides released to the environment by nuclear power and industry enterprises in 2007 reduced by 3.5% as compared to 2006. Releases of key dose-contributing radionuclides – strontium-90, iodine-131, cesium-137 – did not exceed 6% of the established guidelines.

Radionuclide releases with discharge water to the drainage network, on the whole for the nuclear industry, was about 36% for alpha-emitting nuclides and less than 5% for beta-emitting nuclides of the established guidelines.

A categorization of potential radiation hazardous facilities was described in the First National Report and is given in Appendix F.

**F.5. Emergency Preparedness (Article 25)**

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**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.

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In Russia the protection of the personnel and population in case of accidents at NI, RS and SF is subject to a set of documents, specifically:

- Federal Law No 170-FL “On the Use of Atomic Energy”;
- Federal Law No 68-FL “On the Protection of the Population and Territories against Emergencies of Natural and Man-Caused Origin”;
- Federal Law No 3-FL “On the Radiation Safety of the Population”;
- "Provisions for the Unified State System for Prevention and Elimination of Emergencies" (approved by Decree of the RF Government No 794 of 30 December 2003, as amended);
- General Safety Provisions (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-02);
- Requirements to Content of a Personnel Protection Plan in the Event of an Accident and to Emergency Preparedness (NP-075-06, NP-015-2000, NP-077-06, NP-078-06);
- Requirements for Planning and Preparedness for Elimination of Consequences of an Accident at Transportation of Nuclear Material and Radioactive Substances (NP-074-06).

These documents have been developed taking account of the Russian and international experience and recommendations of the IAEA safety guides:
The said regulations are to prevent initiation and development of emergencies and to reduce damage thereof. They set guidelines for protection of the Russian Federation citizens and foreign nationals, as well as the environment, against natural and man-induced emergencies; and determine principles of organization, force and capabilities, and interaction of emergency responders.

The Federal Law "On the Use of Atomic Energy" (Article 36) defines responsibilities of the operating organization as regards protection of the nuclear facility workers, population and environment in the event of an accident at a nuclear facility, radiation source or storage facility.

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

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

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

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

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

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

A review statement may include proposals related to the license conditions as regards improvement of emergency preparedness of the nuclear power plant and/or operating organization, which eventually are considered by Rostechnadzor in formulating license conditions.
Also, preparedness of NI, RS and SF for elimination of accidents and their consequences is checked by Rostechnadzor’s inspections during the entire life of NI, RS and SF.

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

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

The SC Rosatom’s OSChS incorporates controlling bodies, force and capabilities of the SC Rosatom’s Central Administrations, organizations reporting to FMBA of Russia and operates at federal and facility levels. Control system, force and capabilities and preparedness for emergency response and elimination are described in the First National Report.

One of FTP NRS’s five activity areas, which is supported with about RUR20bn funds, is fully devoted to establishing and improving the state systems for ensuring and control of nuclear and radiation safety during normal operation and accidents.

**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:*

  1. Qualified staff and adequate financial resources are available;
  2. The provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;
  3. The provisions of Article 25 with respect to emergency preparedness are applied; and
  4. Records of information important to decommissioning are kept.

In Russia decommissioning of NI, RS and SF is regulated by:

- Federal Law “On the Use of Atomic Energy”;
- “Provisions for the Procedure, Sources of Funding and Rules of the Use of the Special Fund to Cover Expenses Incurred by Decommissioning of Nuclear Installations, Radiation Sources, Storage Facilities for Nuclear Materials, Radioactive Substances and RW, and to Cover Expenses Incurred by Research and Development to Justify and Improve Safety of these Facilities”, as approved by Decree of the RF Government No 367 of 02 April 1997;
- Rules of safety insurance at decommissioning of NI, RS and SF (NP-057-04, NP-012-99, NP-028-01 etc.).

The Federal Law “On the Use of Atomic Energy” Article 33 stipulates that the procedure and measures to ensure decommissioning of nuclear facilities, radiation sources and storage facilities should be foreseen in the nuclear facility design as per norms and rules in the field of use of atomic energy.
The procedure for creating funding sources for the decommissioning of nuclear facilities, radiation sources and storage facilities is established by the Government of the Russian Federation and should be determined before commissioning of the said facilities.

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

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

Decommissioning (closure) of NI, RS and SF should be carried out in accordance with NI, RS and SF decommissioning program (closure program) and decommissioning (closure) project. The NI or storage facility decommissioning project must be developed in advance, i.e. before the end of their service:

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

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

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

The administrative and technical measures being implemented in the course of preparation of decommissioning of NI, RS and SF should be aimed at reducing radiation impact to workers (personnel), population and environment down to as low as reasonably achievable, economic and social factors taken into account.

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

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

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

This goal is achieved through:

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

The Concept states that the Russian Federation has shutdown but has not decommissioned over 120 nuclear and radiation hazardous facilities, including:

- 4 nuclear power units;
- 10 production uranium-graphite reactors;
- 18 research reactors with stationary power level.

Urgent solutions are needed for 20 open-air storage reservoirs for RW, including decommissioning (care and maintenance) of the most contaminated industrial reservoirs at PA Mayak (Lake Karachai, Lake Staroye Boloto).
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 properly protect the personnel, population and environment against the radiation impact associated with the above management.

A complete list of regulatory documents is given in Annex 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 use of atomic energy envisage a comprehensive set of measures to ensure nuclear safety during the SNF management and removal of residual heat resulting from the SNF management, including stages of: on-site storage, transportation, storage and reprocessing at the SNF recovery plants.

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

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 practic-
ably acceptable and should not exceed 0.95 during normal operation. In case of any single failure $K_{\text{eff}}$ should not exceed 0.98 (NP-063-05).

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

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

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

Nuclear safety of SNF storage is ensured through:

- limitations on placement of SNF in shrouds, racks, stacks, transportation packages (TUK);
- limitations on a number of fuel rods and assemblies in shrouds, racks, drums with SNF and TUKs;
- limitations on a number of packages, shrouds in a group and packages in a stack;
- limitations on placement of shroud groups, stacks, racks, SNF drums, overpacks;
- the use of heterogeneous or homogeneous absorbers;
- control over positions of fuel rods and assemblies, heterogeneous absorbers, packages, shrouds, racks, stacks;
- control over presence, condition and composition of the cooling media and occurrence of moderator in SNF dry storage facilities;
- observance of process parameters of the SNF storage and transportation system.

Nuclear safety of an SNF reprocessing facility is achieved through:

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

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

SNF hold-up ponds should be fitted with systems for heat removal from the cooling media which are necessary for safety assurance.

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

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

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.


Article 4. General Safety Requirements

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

In so doing, each Contracting Party shall take the appropriate steps to:
ii) ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;

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

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

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

According to the Rostechnadzor’s guiding documents (for example, RD-05-15-02), a plan of reduction of releases and discharges should be included in licensing package by the operating organization when applying for a license.
The FTP NRS plans for a set of measures to reduce quantities of RW accumulated during the past activities, which provide for timely reprocessing of RW being generated. This information is given in section B.

New methods of RW reprocessing are being developed which can substantially reduce quantities of RW. The FTP “Nuclear and Radiation Safety Ensurance in 2008 and until 2015” plans for development of a pilot demonstration center (PDC) for RW reprocessing at MCC. The center is to employ innovation technologies and have a capacity of up to 100 tons per year. The PDC is to experimentally test several technologies for SNF reprocessing, namely: simplified PUREX-process, crystallization recovery of uranium, fluid extraction and, possibly, some other.

Results of PDC pilot operation will be used as the basis for selection of technological and engineering solutions which can be utilized at a large-scale SNF reprocessing plant.

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

**Article 4. General Safety Requirements**

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

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

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

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

Having in mind a realistic projection of SNF generation and accumulation in on-site storage facilities, the nuclear industry of the Russian Federation has started developing centralized storage facilities for SNF. The FTPs “Development of NPEC” and “NRS”, as well as the Federal Law “On the State Atomic Energy Corporation “Rosatom”” have made the development of an up-to-date national system of safe SNF management a one of high priority tasks.

The FTP NRS notes the determining role of the State in solving SNF and RW management issues. The program foresees a federal budget financing of development of SNF and RW infrastructure, some of which are given in section B.

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

**Article 4. General Safety Requirements**

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

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

*iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;*
Radiation safety regulation and existing regulatory requirements for protection of the personnel, population and environment, assessment of radiation impact to the NI, RS and SF personnel, procedure for radiation monitoring of the personnel exposure and contamination of the environment due to releases and discharges resulted from SNF management, as well as the state supervision over the radiation protection of the personnel, population and environment are described in detail in section F.4 (Article 24).

According to the Russian legislation, the operating organization should apply to get a construction permit and an operating license for SNF 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, its 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 (if deviated).

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

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

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 humans at the state-of-the-art level guarantee that representatives of other species are also not exposed to risk.

At the stage of design and construction of facilities the safe operation limits should be set forth with regard to releases and discharges to be at the level of limiting permissible releases and (or) limiting permissible discharges and operational limits as permissible releases and permissible discharges. During normal operation of the facility limiting permissible releases and (or) limiting permissible discharges should not be exceeded.

For each radioactive substance release (discharge) source the values of reference levels of releases (discharges) should be monitored and recorded, including: in case of a release – air (gas) flow rate, qualitative and quantitative radionuclide composition, total activity of radionuclides in the release; in case of a liquid discharge – liquid flow rate, qualitative and quantitative radionuclide composition, total activity of radionuclides in the discharge.

Radiation safety is ensured through rigorous following process parameters provided in the relevant sections of the process regulations.

On-line information on gamma levels at enterprises of the Russian Federation can be obtained through the automated radiation monitoring system at http://askro.atomlink.ru.
The Russian Federation undertakes rehabilitation of the population and territories, including that under the federal target programs and other projects and programs aimed at radiation safety ensurance in a region.

The radioecological monitoring being carried out by SNF management enterprises has shown no effects of SNF storage facilities on the environment.

The radioecological monitoring at the spent nuclear fuel transportation and storage is an important constituent of the environmental safety ensurance. Monitoring results are annually presented as reports. In 2007, radionuclide content in atmospheric air of the industrial site, within CA and nearest settlements was below permissible levels as regulated by NRB-99.

Taking account of international recommendations and provisions of “Basics of the Environmental Policy of Rosatom”, the enterprises involved in SNF management have started implementing the international environmental standards. At present, the environmental monitoring systems as per ISO 14001 standard has been implemented at JSC AECC, JSC MSZ, JSC NCCP, JSC CMP and Balakovo NPP.

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

Four SEPs within unified SFA repatriation projects have been developed and granted positive statements of the state environmental review which cover fuel from RR of the Academy of Sciences of the Republic of Uzbekistan, RR of the Nuclear Research Institute Rez in the Czech Republic, and RR in Salaspils in the Republic of Latvia:

1. SEP “Reduction of Radiation Risks in the PA Mayak Region: development of transportation capabilities to ensure radiation safety of operations to eliminate industrial reservoir V-9”.

The program target is to reduce risks of adverse impacts of radiation to the PA Mayak’s personnel and population of nearby territories through an increase of the economic safety level of industrial reservoir V-9.

2. SEP “Improvement of Radiation Monitoring in the PA Mayak Region: development of dosimetry, radiometry, spectrometry monitoring systems and computer-based and methodological means of data analysis and processing”.

The program target is to ensure radiation safety of the personnel and population, reduction of risks of radiation impact through building an effective system for radiation monitoring and control based on state-of-the-art computer-based and methodological means, dosimetry, radiometry, spectrometry instrumentation for determining levels of radiation impact to and contamination of territories, including in the course of planning and implementing rehabilitation works in the PA Mayak region.

3. SEP “Rehabilitation Measures at Radiation-contaminated Sections of the River Techa Flood-lands within Muslyumovo Railway Station Boundaries”.

The program target is to reduce risks of negative impacts of radiation to the population and to improve the environmental situation through rehabilitation measures at radiation-contaminated sections of the River Techa flood-lands within boundaries of Muslyumovo Village/Railway Station in Kunashaksky Municipality of Chelyabinsk Region.

4. SEP “Rehabilitation of Radiation-contaminated Sections of PA Mayak Territory”.

The program target is to reduce risks of adverse radiation impacts to the personnel and population and to improve the environmental situation through rehabilitation of landfill reposito-
ries of solid radioactive waste of PA Mayak and building up an effective system for diagnostics of repository conditions and radiation monitoring of works to rehabilitate contaminated sections of the plot.

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 facilities 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 SNF management is a compulsory condition for granting a license.

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

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

Fire and explosion risks are subject to “Rules of Fire Safety in the Russian Federation” (PPB 01-03), as well as federal norms and rules in the field of SNF management developed by Rostechnadzor, which establish fire and explosion safety requirements for SNF management, including for SNF reprocessing processes.

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

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

Article 4. General Safety Requirements

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

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

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

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

Legal provisions for environmental protection are stipulated in the Federal law “On the Environmental Protection”. Main principles of environmental protection are the observance of the human right for favorable environment and mandatory environmental impact assessment when making decisions on economic or other activities. In elaboration of provisions of the law the federal norms and rules establish the principle of protection of future generations (NP-058-04), which states that projected levels of exposure of future generations due to the uses of atomic energy and resulted RW disposal should not exceed permissible exposure levels for the population as established by the existing regulations.

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

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

The FTP NRS provides for solving many of accumulated problems related to reduction of burden on future generations. A substantial funding is to be provided for key SNF management facilities (see section D).

G.2. Existing Facilities (Article 5)

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

In Russia the existing regulatory system for the design, construction operation, maintenance and repair, inspection and testing of SNF management facilities, 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 existing NI and SF where SNF management is carried out have licenses granted by the Federal Environmental, Industrial and Nuclear Supervision Service for operation and handling of nuclear material. Operating licenses are granted after the safety assessment basing on
results of the review and expert evaluation of submitted documents which justify safety of operation and results of inspection of safety assurance at operation of the facility.

The similar procedure is employed if a license-holder applies for amending the license conditions.

The composition of document package which justifies nuclear and radiation safety of the operated facility is defined by a number of regulations (NP-051-04, NP-066-05, NP-006-98, NP-039-02, RD-04-03-2006 and other).

In the course of licensing reviews the inspections are conducted to:

- assess safety assurance directly at NI and SF;
- check on credibility of the submitted information;
- assess by Rosatomnadzor of the availability of capabilities and conditions for conduct of the declared activity to the applicant.

According to requirements of the Federal Law “On the Use of Atomic Energy” Article 35, the operating organization continuously controls safety of operations of NI and SF. The control and inspections conducted by the operating organization are aimed at early detection and prevention of deficiencies in NI and SF operation.

The operating organization conducts comprehensive and targeted inspections of NI and SF operational safety.

Therefore, operation of all SNF management facilities is carried out in accordance with conditions of a Rosatomnadzor’s license granted to the operating organization for operation of corresponding facilities, handling of nuclear material and transportation of SNF, which is confirmed through inspections.

The existing NI and SF continuously analyze and account operational events at facilities, including safety significant ones; this is regulated by the following documents on procedures for operational event investigation and accounting (NP-004-97, NP-027-01, NP-047-03, NP-014-2000 and other).

The operating organization arranges for drafting and releases quarterly and annual reports covering all operational events at NI, RS and SF, including safety significant events, along with their direct and root causes, facilitating factors and corrective measures taken to exclude their recurrence.

All NFC enterprise which operate SNF management facilities should annually submit reports in accordance with provisions of the “Composition and Content of an Annual Report on Nuclear and Radiation Safety of Nuclear Fuel Cycle Facilities” (RB-043-08).
G.3. Siting of Proposed Facilities (Article 6)

**Article 6. Siting of Proposed Facilities**

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

(i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;

(ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment;

(iii) to make information on the safety of such a facility available to members of the public;

(iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

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

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

- Federal Law “On the Use of Atomic Energy”;
- Federal Law “On the Environmental Protection”;
- On the Rules for Decision-Making on Siting and Construction of Nuclear Facilities, Radiation Sources and Storage Facilities (Decree of the RF Government No 306 of 14 March 1997);
- NPP Siting. Basic Safety Criteria and Requirements (NP-032-01);
- Siting of Nuclear Fuel Cycle Facilities. Principal Criteria and Safety Assurance Requirements (NP-050-03);
- Accounting of External Natural and Man-Induced Events to Nuclear Facilities (NP-064-05).

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

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

Decisions regarding siting and construction of nuclear installations, radiation sources and storage facilities are made with the account taken of their radiation impact to the environment.

Documents on the radiation impact assessment of a nuclear facility, radiation source or storage facility, in a package with other necessary documents on the said nuclear facilities,
should be submitted by the corresponding body that controls over the uses of atomic energy (SC Rosatom) or operating organization for the state environmental review.

The siting decision is taken with the consideration of:

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

A study of natural and man-made conditions in the NI and SF siting region is conducted in accordance with:

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

The above documents were developed with the account taken of the following international documents:

- Code on the Safety of Nuclear Power Plants: Siting, Safety Series No. 50-C-S (Rev. 1), IAEA, Vienna, 1990;

At the stage of feasibility justification of the NI and SF construction the surveys and studies of processes, phenomena and factors capable of impacting NI and SF safety are carried out. Surveys and studies of processes, phenomena and factors capable of impacting NI and SF safety should be carried out in the NI and SF location region and on the site.

In the course of the feasibility study/justification of NI it should be confirmed that the site conforms with the set safety criteria, specifically:

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

- selection of sizes of the emergency planning zone and evacuation planning zones considering medical, biological, demographic and other characteristics of the region;

- creation of conditions for timely evacuation of the population;

- justification of a possibility to eliminate consequences of design basis and beyond design basis accidents, as well as to take prompt measures to prevent unauthorized actions towards NI and SF.

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

At the stage of region and site selection for NI and SF the study should produce information on factors that limit siting.

It is allowed to site a NI and SF in unfavorable regions which are characterized by the presence of hazardous processes, phenomena and factors provided technical and organizational safety ensurance measures are in place.

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

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

In selecting sites for new SNF management facilities the Russian Federation will proceed from provisions of the Convention Article 6 para. 2.


*Article 7. Design and Construction of Facilities*

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

(i) the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

(ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;

(iii) the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.

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

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

- General Safety Provisions (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-02);

- NPP Seismic Design Standards (NP-031-01);
● Accounting of External Natural and Man-Induced Events Impacts to Nuclear Facilities (NP-064-05);
● Fire Safety Rules of the Russian Federation (PPB 01-03);
● Sanitary Rules of Design and Operation of Nuclear Power Plants (SP YaU and PKh-03);
● SNF Dry Storage Facilities. Safety Requirements (NP-035-02);

In compliance with safety requirements the facility 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 and operational events, including design basis accidents, should not result in exceeding normative levels of exposure of the personnel and the public, normative levels of releases and discharges of radioactive substances and concentration of radioactive substances in the environment.

The requirements of the federal norms and rules (NP-001-97, NP-033-01, NP-022-2000, NP-016-05, NP-038-02) determine that organizational and technical measures for the design and construction of SNF management facility should be performed with the consideration of its future decommissioning (closure).

Technical and organizational approaches used to ensure safety of SNF management facilities should be justified by the previous experience or by tests, studies, and experience in operation of prototypes. This approach 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 be put forward by the state authorities, by the local government and non-governmental 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).

All organizations which operate SNF management facilities have operating licenses granted by Rostechnadzor.

Rostechnadzor grants operating licenses only after the positive statement is made by the state environmental review and after review of documents for getting the license to build and operate the facility prepared by the operating organization.
Generally, the operating organization should submit the following information:

- a description of the region and site;
- main design provisions of the facility, buildings, structures, systems and components;
- process systems and processes;
- control and monitoring;
- radiation safety
- nuclear safety
- RW management, releases and discharges of radioactive substances;
- accident analysis;
- commissioning;
- organization of operation;
- safe operation limits and conditions, operational limits and conditions;
- quality assurance;
- decommissioning.

According to Article 11 of the Federal Law “On the Environmental Review”, the following is subject to the mandatory state environmental review:

- feasibility studies and projects of the construction, renovation, expansion, retrofitting, conservation and elimination of SNF management facilities;
- justification documentation of licenses for activities (for example, operation of a SNF management facility), 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 facility.

To obtain the license for construction or operation of a SNF management facility 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 facility. The SAR should include safety analysis results of the SNF management facility, 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 facility.

In the process of review of the license application documentation inspections are carried out to:

- assess safety ensurance issues directly at the facility;
- verify credibility of the submitted information on the site;
- assess capabilities and availability of conditions to carry out the declared activity by the operating organization.

At the present time, Rostechnadzor grants licenses, normally, for 5 years (10 year for NPPs) and carries out facility safety reviews at the same frequency that includes verification or revision of operational limits and conditions taking account of operational experience and the state of scientific and technical support.
In addition to the regulated procedures for assessment of compliance with norms and rules, MCC did a safety analysis of the WWER-1000 spent nuclear fuel storage facility; the analysis was carried out with the participation of experts of the European Community and Russian organizations (Project No R-01/94 of TACIS Program). A classification of abnormal events and accidents related to the facility was generated and a probabilistic safety analysis was performed for potential accident sequences.

G.6 Operation of Facilities (Article 9)

**Article 9. Operation of Facilities**

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

(i) the license to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

(ii) operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;

(iii) operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;

(iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;

(v) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

(vi) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

(vii) decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.

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

The procedure for obtaining licenses to operate SNF management facilities is defined in the “Procedure for Licensing of Activities in the Field of Use of Atomic Energy”. A decision on granting the SNF management facility operating license is made by Rostechnadzor after the operating organization submits license application documents.

The composition of the license application package to justify nuclear and radiation safety of NI and SF associated with SNF management to be commissioned after construction is defined in Rostechnadzor’s guiding documents (RD-04-27-2006, RD-06-16-97, RD-05-15-2002). To obtain the operating license, the operating organizations should provide the operating documentation and other documents related to safety assurance of the facility, including a Commissioning Report, Facility Acceptance Report, Compliance Report Regarding Construction License Conditions, Commissioning Program, Startup and Alignment Program and Pilot Operation Program.

SNF management-related NI and SF operation is allowed only after all startup and alignment works have been completed and integrated system (component) run has been carried out and provided there is a Safety Analysis Report, as revised considering results of startup and alignment works and the integrated run of systems (components).
G.6.2. Setting and Updating Safe Operation Limits and Conditions

Basing on documentation written by designers of the equipment, processes and design, the operating organization before the integrated run of systems (components) should develop operating documentation of NI and SF related to SNF management. The operating documentation contains rules and main approaches of safe operation, general safety related operation procedures, safe operation limits and conditions, specific instructions to workers (personnel) as to how to perform in normal operation and operational events, including pre-accident states, workers’ (personnel’s) actions to ensure safety in design basis and beyond design basis accidents. The operating documentation should be updated using results of commissioning of the facility.

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

The operating organization should carry out planned preventive and (or) capital repairs at the NI and SF related to SNF management as per their schedules.

Basing on the existing regulatory and institutional documents, the enterprise administration drafts a specific maintenance and repair program for which implementation the maintenance and repair schedules are generated and approved. The work is carried out in accordance with procedures for maintenance and repairs of safety important systems and as per a schedule approved by the enterprise administration.

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

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

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

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

A technical procedure of checks and tests, as approved in accordance to the established procedure, regulates checks and tests of safety importance systems.

All repairs are carried out by the facility repair personnel and contractors who have Rostechnadzor’s licenses.


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

At different stages of NI and SF construction, commissioning, operation and decommissioning, types and ways of technical and engineering support vary depending on tasks the operating organization and specific facility is facing.
As a rule, the operating organization, as well as the enterprise administrations involve specialist research, development, repair, adjustment and other organizations, and NI and SF equipment producers in performance of necessary works and rendering necessary services.

**G.6.5. Accounting of NI and SF Safety Significant Operational Events**

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

At present, the analysis and accounting of NI and SF operational violations, including safety significant ones, is regulated by:

- Provisions regarding investigation and accounting procedures of operational violations (NP-004-97, NP-047-03, NP-27-01 and other);
- In-house documents of the operating organization which regulate procedures for NI and SF operational event investigation and accounting.

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

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

**G.6.6. NI and SF Operating Experience Information Collection and Analysis**

During an NFC facility operation the operating organization should duly collect, process, analyze, systematize and store information on failures of safety important system components and erroneous actions of workers (personnel), as well as prompt transfer of such information to the organizations concerned.

To determine the scope of engineering solutions and organizational measures needed to improve safety of the operated facility, the operating organization analyzes its current safety level. All practicable measures aimed at achieving conformance to regulatory requirements should be implemented as based on the analysis results.

When the NFC facility reaches its assigned (or 30-year) end of service, the operating organization should assess a possibility of extending the NFC facility life.

**G.6.7. Decommissioning program**


The operating organization has to develop decommissioning plans considering upgrades made and consequences of earlier incidents.

Organizational and technical measures in the course of design, construction and operation of a NFC facility should be carried out having in mind its eventual decommissioning.

Decommissioning should be carried out in accordance with a decommissioning program and project.
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 carried out. The FTP “Nuclear and Radiation Safety Ensurance for 2008 and until 2015” plans for a study of possibilities of disposal of non-reprocessable SNF, including:

- the development of assessment criteria and methodology of selection of a geological host environment and sites for safe isolation of non-reprocessable SNF, an methodology of SNF underground storage facilities, as well as radioisotope migration models in crystalline rock of different composition;
- technical, environmental and economic assessment of possibilities of ultimate isolation of different types of SNF in MCC’s underground facilities;
- integrated geological studies.
Section H. Safety of Radioactive Waste Management

H.1. General Safety Requirements (Article 11)


**Article 11. General Safety Requirements**

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

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

(i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;

(ii) ensure that the generation of radioactive waste is kept to the minimum practicable;

(iii) take into account interdependencies among the different steps in radioactive waste management;

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

(v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

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

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

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

The Federal Law “On the Use of Atomic Energy” Article 48 states: “In the storage or disposal of radioactive waste is must be reliably isolated from the environment, and the present generation and future generations and biological resources must be protected against exposure to radiation above the limits laid down by the rules and regulations in the sphere of the use of atomic energy. The storage or disposal of radioactive waste is permitted only in storage facilities specially designed for that purpose. A provision must be made for storage or disposal of radioactive waste in planning documentation or technical specifications at an essential stage of any nuclear technological cycle.”

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

Basic federal norms and rules for RW management are:

- Safety at Radioactive Waste Management. General Provisions. (NP-058-04);
These regulations were developed taking account of IAEA recommendations laid down in Safety Series No 111-F “Principles of Radioactive Waste Management”, No 115 “Basic Safety Standards” and WS-G-1.2 “Management of Radioactive Waste from the. Mining and Milling of Ores”.

A complete list of regulations is given in Appendix E.

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

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

At present, the federal law “On Radioactive Waste Management” is under drafting (see section E).


The key objective of the unified state RW management system is to ensure safe and economical management of RW which allows for the reliable isolation of all accumulated and newly generated RW to protect population and environment until the waste lose their hazardous and noxious properties.

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

**Article 11. General Safety Requirements**

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

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

* (i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;*

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Federal norms and rules in the field of safe management of RW pay proper attention to criticality and removal of residual heat generated in the course of RW management.


According to the Russian regulations (NP-019-2000, NP-020-2000, NP-021-2000), the design and geometrical sizes of the equipment intended for collection, reprocessing, storage and conditioning of RW, content of nuclear hazardous fissile materials in conditioned RW and geometry of its packages, as well as handling procedures should exclude initiation of SCR.

Rooms where the equipment for collection, reprocessing, storage and conditioning of RW containing nuclear hazardous fissile materials is located should be fitted with automated...
alarm systems which should be ready to detect SCR at all times. SRW containing nuclear hazardous fissile materials, which compression can lead to SCR, should not be subjected to compaction.

In case of disposal of RW (NP-058-04) containing nuclear fissile substances (material) there should be engineering solutions and organizations measures in place that are aimed at prevention of SCR initiation. Properties of engineering and natural barriers should exclude SCR due to possible concentration of radionuclides in the course of their migration within the RW disposal system.

Nuclear safety at collection, reprocessing, storage and conditioning of RW containing nuclear hazardous fissile materials is regulated by federal norms and rules in the field of use of atomic energy which define rules of nuclear safety.

The “Sanitary Rules of Radioactive Waste Management” (SPORO-2002) stipulate that heat release by primary waste should be considered when selecting forms of RW conditioning. The volume of conditioned RW should be minimal as conditioned, in particular, by specific heat release and heat removal conditions.

In case of RW disposal the host rock should withstand heat impact of heat-releasing RW, retain their isolating properties and provide for heat conditions that do not lead to degrading of the engineering barriers integrity in the radioactive waste deep geological disposal facility.

**H.1.2. Minimizing Radioactive Waste Generation (Article 11 (ii))**

*Article 11. General Safety Requirements*

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

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

*ii) (ii) ensure that the generation of radioactive waste is kept to the minimum practicable;*

The Russian regulations establish requirements according to which the generation and accumulation of RW in the course of RW management should be kept to the minimum practicable (the principle of control over RW generation).

Specific engineering solutions, means and organizational measures to minimize RW with regard to its activity, mass (volume) should be provide in and implement when developing design and operating documentation of the RW management facilities.

To achieve a significant reduction of RW volumes it is planned to build over 30 new RW conditioning and reprocessing facilities at nuclear power plants described in section B.

Massive works to develop and construct RW management facilities which would minimize volumes of RW being generated are planned under the FTP NRS, including:

- development of a complex for cementation of liquid and heterogeneous intermediate-level LRW, low-level LRW clean-up facilities, a SRW reprocessing complex at PA Mayak;
- construction of a low-level RW clean-up facility at PA Mayak;
- construction of a combined sewerage system at PA Mayak;
- construction of a facility for disposal of organic LRW at SCC and other.
H.1.3. Interdependence among Different Steps of RW Management (Article 11 (iii))

Article 11. General Safety Requirements

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

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

(iii) take into account interdependencies among the different steps in radioactive waste management;

The Russian regulations (NP-058-04) establish requirements under which the principle of consideration of interdependencies among steps of RW generation and management should be taken into account.

In the Russian Federation interdependencies of different steps of RW management in the course of decommissioning of nuclear and radiation hazardous facilities are to be taken care of by the unified state RW management system which is provided by the Federal Law “On the Radioactive Waste Management”.

Also, the FTP NRS provides for solving a large number of tasks to eliminate problems occurred in the past due to breaks of interdependencies among different stages of RW and SNF management (see section B).

A number of especially hazardous facilities built in the past will be rendered safe. They include the most contaminated industrial reservoir V-9 (Lake Karachai) – by 2015; mothballing of industrial reservoir V-17 (Staroye Boloto) – by 2025. It is also planned to solve delayed problems at MCC and SCC (including mothballing of reservoirs B-1, B-2, B-25, pulp storages PKh-1, PKh-2 and other).

H.1.4. Protection of Individuals, Society and Environment (Article 11 (iv))

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

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

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

The Russian regulations establish requirements under which at all stages of RW management (mining and processing of ores of radioactive substances and other minerals, collection, reprocessing, storage and disposal of RW) the principles of ensuring acceptable levels of protectiveness of workers (personnel) and population against radiation impact from RW should be observed in accordance with the principles of justification, dose limitation and optimization (the principle of protection of human health) and the principles of ensuring acceptable levels of protectiveness of the environ against adverse radiation impact of RW (the principle of the environmental protection).

The implementation of the principles of ensuring acceptable levels of protectiveness of workers (personnel) and population against radiation impacts from RW should be through the
consistent realization of the defense-in-depth concept which is based on the use of physical barriers on the propagation paths of ionizing radiation and radioactive substances to the environment, as well as technical and organizational measures to protect physical barriers and retaining of their effectiveness, and to protect workers (personnel), population and environment.

According to OSPORB-99 which is binding for all RW management legal entities irrespectively of their subordination and form of ownership, the operating organization is responsible for radiation safety and provide for:

- regular monitoring of the radiation situation at work places, in premises, in the territory of the organization, controlled area and surveillance zone, as well as of releases and discharges of radioactive substances;
- control and accounting of individual exposure doses of the personnel;
- regular information of the personnel on radiation levels at work places and individual exposure doses.

Measures to protect individuals, society and environment in the course of RW management are generally similar to those described in section G.1.4; this section also contains information on exposure of the personnel, results of environmental monitoring at RW reprocessing and storage enterprises.

In the course of management of RW accumulated in the surface reservoirs – LRW storage reservoirs and tailing dumps – there are engineering means and organizational measures in place to prevent exposure of workers (personnel) and population in excess of levels established by radiation safety standards, contamination of the environment, including contamination of surface water reservoirs and ground water with radionuclides, transfer of radioactive aerosols by wind, dust formation and transfer of radionuclides with dust.

The Federal Law “On Special Environmental Programs for Rehabilitation of Radiation-Contaminated Sections of Territories” provides for special measures to ensure radiation safety of the population, reduction of general risk of radiation impact and improvement of the ecological situation at radiation-contaminated sections of territories (see section G).

**H.1.5. Taking Account of Biological, Chemical and other Risks that May be Associated with Radioactive Waste Management (Article 11 (v))**

**Article 11. General Safety Requirements**

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

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

v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

Measures being undertaken in the Russian Federation to take account of biological, chemical and other risks that may be associated with RW management are generally similar to the measures described in section G.1.5 for SNF management.
H.1.6. Analysis of Actions that Have Predictable Consequences for Future Generation (Article 11 (vi))

Article 11. General Safety Requirements
Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:
vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

The principle of protection of future generations is implemented through meeting the requirement for an analysis of predictable levels of radiation impacts on future generations due to RW management; these levels should not exceed permissible exposure levels of the population, as established by the existing regulations (Appendix E).

In the Russian Federation, the measures undertaken to protect future generations which may be connected with RW management are generally similar to the measures described in section G.1.6 for SNF management.

H.1.7. Minimization of Burdens to Future Generations (Article 11(vii))

Article 11. General Safety Requirements
Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:
vii) aim to avoid imposing undue burdens on future generations.

The avoidance of undue burdens associated with the necessity of safety ensurance in the course of RW management is defined in the requirements of regulations (Appendix E).

The FTP NRS provides for solving many of accumulated problems related to reduction of burdens to future generations. Funds of RUR29.7bn are allocated to deal with key facilities of RW management (see section D).

A number of especially hazardous facilities built in the past will be rendered safe, including industrial reservoirs V-9 (Lake Karachai) and V-17 (Staroye Boloto) at PA Mayak. It is also planned to solve delayed problems of RW management at MCC and SCC.
H.2. Existing Facilities (Article 12)

Article 12. Existing Facilities and Past Practices

Each Contracting Party shall in due course take the appropriate steps to review:

(i) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;

(ii) the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.

Federal norms and rules provide for corresponding measures of safety improvement of the existing RW management facilities.

Procedures for licensing and amending license conditions of the existing RW management facilities is generally similar to that described in section G.2.

In addition, according to the Russian regulations, an analysis of the current safety level and projection calculations for safety assessment of the RW storage system should be conducted to identify the necessity of implementing technical solutions and organizational measures aimed at improvement of safety of the existing RW storage facilities. Results of such analysis and projection calculations should be laid as the basis for implementation of all reasonably practicable measures aimed at meeting the requirements of norms and rules.

According to NRB-99, in case of a radiation accident or detection of a radioactive contamination, the limitation of exposure is achieved through implementation of protective measures towards the environment and (or) humans, as a rule. These measures may disrupt normal living of the population, economic and social functioning of the territories, i.e. they are the intervention which incurs not only an economic loss but also an unfavorable impact on health of the population, psychological impact on the population and unfavorable changes in the ecosystem state.

When deciding on a nature of the intervention (protective measures) one should be guided by the following principles:

- planned intervention should incur more benefit for the society and, in the first place, for exposed individuals than harm, i.e. a reduction of damage due to the dose reduction should be sufficient to justify harm and costs of the intervention, including its social costs (the principle of justification of the intervention);
- form, scale and duration of the intervention should be optimized so that the net benefit of the dose reduction, i.e. the benefit of reducing the radiation damage, the damage due to the intervention deducted, should be maximum (the principle of optimization of the intervention).

The FTP NRS provides for solving a large number of tasks to improve and modernize RW management facilities aiming at safety improvement and reducing of risks of adverse impacts, including:

- buildings for placing electric furnaces EP-500/5,6, vitrified RW storage facility, equipment for reprocessing of accumulated LWR at PA Mayak;
- RW management complex at IPPE;

- Process and storm sewage at NIIAR;
- Moscow LRW reprocessing station at FSUE SSC RF VNIINM;
- System for management of accumulated RW at FSUE PA Sevmash;


**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.


A siting decision is made taking account of:

- needs in them to solve economic tasks in the Russian Federation and its individual regions;
- availability of conditions for siting the said facilities that meet norms and rules in the field of use of atomic energy;
- absence of a threat to the safety of the RW management facility, storage facility from nearby civil industrial facilities;
- possible social and economic consequences of siting of the said nuclear facilities for the industrial, agricultural, social, cultural and residential development of the region.

Rules of site selection for RW management facilities, requirements for accounting of external impacts and justification of the site acceptability are similar to those described in section G.2.

The regulatory document “Disposal of Radioactive Waste. Principles, Criteria and Main Safety Requirements” (NP-055-04) establish principles, criteria and main safety requirements for RW near-surface disposal, RW disposal in deep geological formations, as well as for LRW disposal. A RW disposal facility (LRW deep disposal facility) meets post-closure safety requirements if:
during normal (evolutionary) pace of natural processes on the RW disposal facility (LRW deep disposal facility) site (most likely scenarios of the evolution of the RW disposal system) its radiation impact does not lead to exceedance of the annual effective dose limit above the quota established for the disposal;

under unlikely (catastrophic) natural and man-induced external impacts on the site of RW disposal facility (LRW deep disposal facility) (unlikely scenarios of radionuclide migration from the RW disposal system) the individual total risk limit equal to $1.0 \times 10^{-5}$ year$^{-1}$ for the critical group of the public is not exceeded.

Sufficiency of technical solutions to ensure safety adopted in the design of the RW disposal facility (LRW deep disposal facility) should be justified in the first place for the entire period of the potential danger of disposed RW taking account of possible natural and man-induced external impacts in the RW disposal facility (LRW deep disposal facility) siting region as well as taking account of physical and chemical processes taking place in the RW disposal facility (LRW deep disposal facility).

In the elaboration of the requirements of the Federal Law “On Environmental Review”, a sitting decision is made after the mandatory state environmental review.

The state environmental review procedure stipulated by the law provides, as one of the binding principles, the meeting the principles of publicity, involvement of non-governmental organizations (associations) and consideration of the public opinion in the decision-making.

When selecting sites for new RW management facilities, the Russian Federation will proceed from the Convention Article 6 para. 2.

H.4. Design and Construction of Facilities (Article 14)

Federal norms and rules provide for the corresponding measures to ensure safety of RW management facilities at the stages of design and construction:

- Basic Sanitary Rules of Radiation Safety (OSPORB-99);
- Sanitary Rules of Design and Operation of Nuclear Power Plants (SP AS-03);
- Sanitary Rules of Radioactive Waste Management (SPORO-2002);
- General Safety Provisions of Nuclear Fuel Cycle Facilities, NP-016-05 (GSP NFCF);
● Collection, Reprocessing, Storage and Conditioning of Solid Radioactive Waste. Safety Re-
   quirements. NP-020-2000;
● Near-Surface Disposal of Radioactive Waste. Safety Requirements, NP-069-06;
● Disposal of Radioactive Waste. Principles, Criteria and Main Safety Requirements, NP-055-
   04 and other.

The design documentation should include justification of safety measures at the stages of
design, construction, refurbishment, operation, decommissioning, as well as in case of an
accident. This documentation can be approved provided there is a sanitary and epidemiolog-
ical statement issued by the state sanitary and epidemiological regulatory bodies.

According to the Russian regulations, the design and operating documentation should in-
clude specific technical solutions and organizational measures to ensure safety at manage-
ment of RW pertaining to each category, including those to prevent radionuclide releases
and discharges in excess of limiting permissible levels.

H.5. Assessment of Safety of Facilities (Article 15)

**Article 15. Assessment of Safety of Facilities**

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

(i) *before construction of a radioactive waste management facility, a systematic safety
assessment and an environmental assessment appropriate to the hazard presented by the facility
and covering its operating lifetime shall be carried out;*

(ii) *in addition, before construction of a disposal facility, a systematic safety assessment and an
environmental assessment for the period following closure shall be carried out and the results
evaluated against the criteria established by the regulatory body;*

(iii) *before the operation of a radioactive waste management facility, updated and detailed
versions of the safety assessment and of the environmental assessment shall be prepared when
deemed necessary to complement the assessments referred to in paragraph (i).*

All organizations which operate RW management facilities have operating licenses granted
by Rostechnadzor.

Operating licenses are granted only after the positive statement of the environmental review
is issued and a review of documents submitted by the operating organization to get the con-
struction and operating license is passed.

To meet the requirements of the Federal Law “On the Use of Atomic Energy”, all RW man-
gement facilities are subject to mandatory environmental review.

The environmental review is based on the main principles as follows:

● presumption of potential ecological hazard of any proposed economic or any other activi-
ty;

● obligation of performing state ecological review prior to making a decision on implementa-
tion of the object of ecological review (the majority of presently operating Russian nuclear
facilities were commissioned before 1995, due to this environmental review of these facili-
ties was not been performed);

● comprehensive assessment of the environmental impact of economic or any other activity
and its consequences;
• credibility and completeness of the information, submitted for the environmental review;
• independence of environmental review experts in executing their authorities as regards the environmental review;
• scientific soundness, objectiveness and lawfulness of the environmental review statements;
• publicity, participation of non-governmental organizations (associations), accounting of public opinion;
• responsibility of the environmental review participants and interested persons for organization, conduct and quality of the environmental review.

The procedure for getting a license to build or operate a RW management facility and conduct of its safety analysis is generally similar to those described in section G.5.

H.6. Operation of Facilities (Article 16)

**Article 16. Operation of Facilities**

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

(i) the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

(ii) operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary;

(iii) operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;

(iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;

(v) procedures for characterization and segregation of radioactive waste are applied;

(vi) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

(vii) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

(viii) decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;

(ix) plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.

To meet the requirements of the Federal Law “On the Use of Atomic Energy”, RW management and operation of radiation sources is carried out by organizations which have corresponding permits (licenses) for working in the field of use of atomic energy.

Operating licenses are granted by Rostechnadzor only after the positive statement of the environmental review is issued and a safety review is done, the facility commissioning program is fulfilled, and inspections to check on readiness of the operating organization to safely operate the facility is carried out.

In the process of review of the license application documentation inspections are carried out to:
- assess safety assurance issues directly at the facility;
- verify credibility of the submitted information on the site;
- assess capabilities and availability of conditions to carry out the declared activity by the operating organization.

At the present time, Rostechnadzor grants licenses, normally, for 4 years and carries out facility safety reviews at the same frequency that includes verification or revision of operational limits and conditions taking account of operational experience and the state of scientific and technical support.

According to the Federal Law "On the Use of Atomic Energy", the operating organization should continuously control safety of the facility operation throughout its entire life cycle.

The control and inspection system being implemented by the operating organization is aimed at early detection and prevention of deficiencies in the facility operation and their timely elimination.

Performance checks of safety systems and safety important systems are carried out periodically and in compliance with requirements of regulatory documents.

The operating organization carries out integrated and targeted inspections of safe operation of the facility and inspections of how the Rostechnadzor’s license conditions are complied with.

Also, the operating organization continuously controls and inspects equipment conditions through technical examinations.

The information resulted from the operating organization’s control activities and inspections is presented as reports.

**H.7. Institutional Measures after Closure (Article 17)**

**Article 17. Institutional Measures after Closure**

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

(i) records of the location, design and inventory of that facility required by the regulatory body are preserved;
(ii) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and
(iii) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.

The Federal norms and rules provide for the corresponding institutional controls after closure of a RW disposal facility.

According to the Russian regulations, the organizational and technical measures, which are carried out during operation of a RW disposal facility (RW deep disposal facility), should take account of its future closure.

At the closure of a RW disposal facility (RW deep disposal facility) the operating organization collects, processes, analyzes, systematizes and stores information on operational events, as well as its prompt communication to the concerned organizations in accordance with the established procedure.
The operating organization should document and keep information required for a RW disposal facility (RW deep disposal facility) closure, including design and operating documentation, as well as the information on changes done to process systems, carried out modernizations, contamination with radioactive substances of surfaces before commencement of closure operations; information on the RW disposal facility site, amount and radionuclide composition of LRW and SRW accumulated on the site of RW disposal facility (RW deep disposal facility) during operation, its characteristics and locations, amount of disposed RW, its radionuclide composition and specific activity; information on storage capacity and free capacities of RW storage facilities for placing RW; information on accidents at RW disposal facility that led to radioactive contamination of systems, components, premises and building structures.

A system for accounting and keeping of RW management records should be created at the RW disposal facility, including the accounting of types of RW packages, their number, RW package characteristics, and their locations in the RW disposal facility.

The accounting is carried out using RW package certificates, data of incoming inspection got at the receipt and identified specific locations of RW packages in the RW disposal facility. The RW package certificates and accounting records containing “addresses” of RW packages in the RW disposal facility should be kept by the operating organization until the transfer of the RW disposal facility and related accounting documentation to the books of the federal (regional or local) executive authorities.

After the RW disposal facility closure, the monitoring of the RW disposal system, which includes inspections of conditions of engineering and natural barriers, and monitoring of the surrounding environment should be carried out during the period of time justified in the RW disposal facility closure project.

The RW disposal system monitoring duration is established and justified in the RW disposal facility (RW deep disposal facility) closure project depending on the total activity of disposed RW and its radionuclide composition.

To confirm the safety of LRW deep disposal, a RW disposal monitoring should be carried out with the aim of determining area of RW migration within the geologic environ and its changes; timely obtaining of the information on locations of RW and its components with the geologic environ and on development of processes related to the disposal; an assessment of technical state of main structures of LRW disposal facility; early detection of signs of failures and accidents; documenting and keeping of data of reference observations and their processing results as periodically updated databases.

A monitoring system for the LRW deep disposal should include software and a mathematical model that describes LRW disposal processes; this model should be periodically updated basing on results of reference observations.

The operating organization should ensure safety of the closed RW disposal facility, keeping of the documentation on the closed RW disposal facility during the period of time set forth in the RW disposal facility closure project, as well as should maintain the state of engineering barriers as determined in the closure project in accordance with requirements of the federal norms and rules.

If the RW disposal system monitoring reveals deviations from the ultimate state of the RW disposal facility established by the RW disposal facility closure project that lead to degrading of its safety level, all measures practicable should be implemented to ensure safety of the closed RW disposal facility, including measures to reduce migration of radionuclides, to de-
contaminate soil, to clean-up surface and ground water, to remove water from storage cells and other necessary measures.

The monitoring of the closed RW disposal facility should be carried out in accordance with a program which is developed and implemented by the operating organization. The program should define the procedure, conditions and planned dates of implementation of the following measures:

- safety monitoring of the closed RW disposal facility;
- monitoring of the RW disposal system, including the monitoring of conditions of the engineering and natural barriers;
- environmental monitoring;
- protection of engineering barriers against damages associated with intrusion of animals and roots of vegetation;
- dismantling and elimination of systems and equipment intended for monitoring of the RW disposal system;
- prevention of unintended intrusion of humans.

The program should include:

- a procedure for keeping documents on the closed RW disposal facility;
- a description of the ultimate state of the RW disposal facility after the RW disposal system monitoring is over.
Section I. Transboundary Movement (Article 27)

**Article 27. Transboundary Movement**

27-1 Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments.

In so doing:

(i) a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;

(ii) transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;

(iii) a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;

(iv) a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;

(v) a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.

27-2 A Contracting Party shall not license the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.

27-3 Nothing in this Convention prejudices or affects:

(i) the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;

(ii) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;

(iii) the right of a Contracting Party to export its spent fuel for reprocessing;

(iv) rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.

In the Russian Federation, the transportation of nuclear material and radioactive substances, including importation of SNF, is regulated by the following documents:

- The Basel Convention on the Control of the Transboundary Movement of Dangerous Wastes and Their Disposal;
- The Vienna Convention on the Civil Liability for Nuclear Damage;
- The Federal Law "On the Use of Atomic Energy";
- The Federal Law "On the Environmental Protection";
- The Federal Law "On the Sanitary and Epidemiological Well-being of the Public";
- On the Procedure of Importation of Irradiated Fuel Assemblies of Nuclear Reactors to the Russian Federation (Decree of the RF Government No 418 of 11 July 2003);
- The Federal Law "On Special Environmental Programs for Rehabilitation of Contaminated Sections of Territories" (No 92-FL of 10 July 2001);
- On the State Competent Authority for Nuclear and Radiation Safety at Shipments of Nuclear Material, Radioactive Substances and Products Made Thereof (Decree of the RF Government No 204 of 19 March 2001).
The Federal Law “On the Use of Atomic Energy” (Article 45) states that the transportation of nuclear material and radioactive substances should be carried out in accordance with special rules, rules of transportation of specially dangerous goods, norms and rules in the field of use of atomic energy, and environmental protection legislation of the Russian Federation.

The rules of transportation of nuclear material and radioactive substances provide for rights, obligations and responsibility of the consignor, carrier and consignee; measures of safety, security and a system of agreed measures as to prevent incidents and accidents in transport of nuclear material and radioactive substances; requirements for packing, marking and conveyances; measures to confine and eliminate consequences of potential accidents during transportation of the said material and substances. The rules of transportation of nuclear material and radioactive substances are issued for all possible modes of transport.

According to Article 63 of the said Law, the exporting and importing of nuclear materials, including nuclear fuel, radioactive substances, as well as radiation sources, should be carried out in accordance with the international obligations of the Russian Federation on the nonproliferation of nuclear weapons and the international agreements of the Russian Federation in the sphere of the use of atomic energy.

The importing of SNF from foreign state to the Russian Federation territory for temporary technological storage and (or) reprocessing is carried out in accordance with the procedure established by the Russian Federation legislation and international agreements of the Russian Federation.

The importation of foreign-made irradiated fuel assemblies to the Russian Federation is carried out basing of the positive statement produced by a special commission called for by the President of the Russian Federation.

The importation of irradiated fuel assemblies of nuclear reactors from foreign states to the Russian Federation for temporary technological storage and (or) their reprocessing is permitted only provided the state environmental review and other state reviews of the related project have been conducted, as provided by the legislation of the Russian Federation, a general reduction of risk of radiation impact and increase of environmental safety as a result of implementation of the corresponding project has been justified.

According to the FL “On the Environmental Protection” (Articles 48 and 51), the importation of RW to the Russian Federation from foreign states on the basis of agreements for storage, including those for the purposes of disposal and neutralization, is prohibited.

Functions of the state competent authority for nuclear and radiation safety at shipments of nuclear material, radioactive substances and products made thereof are resting with the SC Rosatom.

The SC Rosatom together with other ministries and agencies, including Rostechnadzor, signs interaction agreements to ensure nuclear and radiation safety at shipments of nuclear material, radioactive substances and products made thereof within the territory of the Russian Federation.

The SC Rosatom together with the interested federal executive bodies, including Rostechnadzor, controls over compliance of the consignor, carrier and consignee organizations with requirements of federal and institutional norms and rules, as well as international obligations of the Russian Federation as regards ensurance of nuclear and radiation safety at radioactive material shipments.
The jurisdiction of the SC Rosatom also includes reviews of documents that justify the conformance of a specific type of the transportation package, special conveyances and conditions of shipment of radioactive materials with the established requirements of nuclear and radiation safety and state standards, as well as with the international obligations of the Russian Federation as to ensuring nuclear and radiation safety at shipments of radioactive materials.

The procedure of importation to the Russian Federation of irradiated fuel assemblies of nuclear reactors, as well as return of these irradiated fuel assemblies or their reprocessing products (including RW) to the supplying state is defined in the RF Government Decree No 418 of 11 July 2003 “On the Procedure of Importation of Irradiated Fuel Assemblies of Nuclear Reactors to the Russian Federation”.

According to the Decree, the importation to the Russian Federation of irradiated fuel assemblies was carried out provided there was the positive statement by the state environmental review on the unified project developed by authorized organizations and coordinated with the Ministry of the Russian Federation for Atomic Energy (now, the SC Rosatom) and the Federal Environmental, Industrial and Nuclear Supervision Service, as well as provided the authorized organizations had relevant licenses granted by the Federal Environmental, Industrial and Nuclear Supervision Service.

The importation of SNF to the enterprises of the Russian Federation is performed in compliance with the international legal norms and Russian legislative basis, in particular:


The transportation of irradiated fuel assemblies and their reprocessing products within the territory of the Russian federation is carried out in accordance with the federal norms and rules in the field of use of atomic energy, special rules for transportation, rules of shipment of dangerous goods, as well as taking account of the existing international guidelines for safe transportation of radioactive materials, including:
• Safety Rules of Transportation of Radioactive Material (NP-053-04);
• Basic Sanitary Rules of Radiation Safety (OSPORB-99);
• Radiation Safety Standards (NRB-99) and other.

The regulation NP-053-04 was developed taking account of recommendations of the IAEA in the "Safe Transport of Radioactive Material" No ST-1, IAEA. The Russian regulation takes account of changes and amendments introduced by the IAEA in "Regulations for the Safe Transport of Radioactive Material. 1996 Edition (Revised), No 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 SNF from foreign countries to the Russian Federation for interim technological storage and (or) reprocessing is the availability of the positive statement of the state environmental review issued on the relevant unified project.

Unified project is the documents prepared in relation to the expected signing of a foreign trade contract for performing the operations with irradiated fuel assemblies, the documents being subject to state ecological review. The documents should be developed and coordinated in compliance with the established requirements, including the following documents:

• a draft foreign trade contract;
• a SEP the implementation of which is performed at the cost of the funds resulting from the foreign trade operations with irradiated fuel assemblies;
• documents justifying a total reduction of risk of radiation impact and enhancement of environmental safety level as a result of implementation of the unified project, as well as the documents justifying the time constraints of the interim technological storage of the irradiated fuel assemblies and the products of reprocessing thereof, envisaged by the foreign trade contract.

A carrier of nuclear material and radioactive substances should have a permit (license) granted by the corresponding state safety regulatory authority to perform works in the field of use of atomic energy.

A foreign trade contract for the importation of foreign-made irradiated fuel assemblies should provide for subsequent return of radioactive waste to the supplying state if otherwise is stated in the international agreements of the Russian Federation.

The return of reprocessing products to the supplying state is carried out under the following conditions:

• the return of reprocessing products should be carried out with meeting of the obligations of the Russian Federation on nonproliferation of nuclear weapons;
• an international agreement of the Russian Federation should include provisions which provide for obligations and guarantees of the supplying state to receive reprocessing products, as well as to provide an opportunity to verify that the necessary conditions for the receipt and safe operation thereof are in place;
• a foreign trade contract should include types, composition, physical form, quantity, type of package of the reprocessing products subject to the return.

A quantity of reprocessing products subject to the return to the supplying state is determined using methodologies agreed upon by the parties proceeding from the condition of ac-
tivity equivalency of the irradiated fuel assemblies earlier imported for reprocessing and the reprocessing products being returned with the account taken of natural decay of radionuclides in the course of operations of the interim technological storage of the irradiated fuel assemblies and reprocessing products, as well as in the course of reprocessing of the irradiated assemblies.

The state supervision over nuclear, radiation and fire safety, as well as the state environmental safety control at all stages of management of irradiated fuel assemblies and their reprocessing products is carried out by Rostechnadzor, bodies for sanitary and epidemiological supervision, the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Natural Disaster Consequences and the Ministry of Natural Resources of the Russian Federation, as per their jurisdictions.

In compliance with the contracts in effect, spent fuel is imported from Ukraine and Bulgaria, while the importation of the spent fuel from the research reactor of the Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan and from the research reactor of the Nuclear Research Institute Rez of the Czech republic has been 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, the Republic of Uzbekistan, and the Czech Republic.

In 2008 the importation of spent nuclear fuel from the research reactor located in Salaspils, the Republic of Latvia, was accomplished. The contract provides for storage of solidified RW resulted from the research reactor spent fuel reprocessing in the Russian Federation.

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 railcars is performed in river port of Izmail (Ukraine).

Transportation through the territory of Russia is performed by rail and by road. In doing this:

● certified packagings are used, and the justification of the design of the packages to the requirements of the rules for safe shipment of radioactive substances is performed both by computational and experimental methods using the mock-ups of the packagings and their components. The results of these justifications of the design of the packages and safety of shipment thereof are given in different calculations, explanatory notes, reports and statement;

● special railcars and special vessels for transportation of packages are used;

● the transportation is organized by special trains under special shipment conditions;

● continuous control of shipments is performed.

All shipments are performed in full compliance with the international legal norms as well as the national legislation of Bulgaria, Ukraine and Russia as well as those of Uzbekistan, the Czech Republic, Latvia and Kazakhstan only in case the permissions granted by the relevant competent authorities of these states are available.
Transportation of NPP SNF of WWER-440 reactors to PA Mayak is performed in transportation packages TUK-6 on the basis of the presently effective certificate-permission RU/042/B(M)F-85T(Rev. 5) in accordance with the procedure determined by Rostechnadzor license for the management of nuclear material in transport No GN-05-401-1412 of 01.05.2005.

Transportation of NPP SNF of WWER-1000 reactors to MCC is performed in transportation packages TUK-13/1V, TUK-10V and TUK-13V according to the existing Rostechnadzor’s license for handling of nuclear material in transport No GN-05-401-1386 of 28.02.2005 basing on the presently valid:

- certificate-permit the design and transportation of transportation package TUK-13/1V RU/052/B(U)F-96T,
- certificate-permit for the design and transportation of transportation package TUK-10/V RU/048/B(M)F-96T,
- certificate-permit for the design and transportation of transportation package TUK-13V RUS/046/B(U)F-96T.

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.

According to the Agreement nuclear fuel of Russian origin, potentially suitable for nuclear weapons manufacturing, should be repatriated to Russia.

By present, the research reactor fuel has been repatriated from Uzbekistan (2006), the Czech Republic (2007), Latvia (2008), and Bulgaria (2008).

In coming years it is planned to repatriate RR SNF from Hungary (2008), Kazakhstan (2008-2009), Romania (2009), Libya (2009), Ukraine (2009), Germany (2009-2010), Belarus (2010), and Poland (2010).

The Federal Law “On the Ratification of the Joint Convention on the Safety of SNF Management and the Safety of RW Management” guarantees, in particular, the fulfillment of the provision of the Convention Article 27-2 that the Russian Federation does not license the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.
Section J. Disused Sealed Sources (Article 28)

Article 28. Disused Sealed Sources

28-1 Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner.

28-2 A Contracting Party shall allow for reentry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.

In compliance with the current legislation of the Russian Federation, the disused sealed ionizing radiation sources (SIRS) are categorized as RW, if their assigned service life has expired or they are acknowledged as defective.

The RW, including disused SRS, importation to Russia is prohibited by the RF Law “On the Environmental Protection”.

On average 55,000 to 60,000 SRSs with an expired operation life are decommissioned per year in the Russian Federation.

The PA Mayak, the main producer of category 1 or 2 IRS (SRS), accepts the decommissioned SRS of its own production from the users in the Russian Federation.

Other SRS after their decommissioning are transferred in the established order to Radon specialized facilities for long-term storage.

Rosatom is drafting proposals for the RF Government as to return of disused RS for recovery.

The legal basis for regulating the management of SRS, including unused ones, are the Federal Laws 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, No 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”, “Provisions on the State Accounting and Control of Radioactive Substances and Radioactive Waste in the Russian Federation” (as approved by Minatom of Russia on 11 October 1999), and federal norms and rules in the field of use of atomic energy issued by regulatory authorities, which establish requirements for control and accounting and disposal of radioactive substances and RW in the organization.

In accordance with the Federal Law “On the Use of Atomic Energy”, the owners of radiation sources and radioactive substances should control their security and proper use as per the said Federal Law, other federal laws and legal regulatory acts of the Russian Federation.

The operating organization should provide for control and accounting of nuclear material and radioactive substances.

Rules of control and accounting of nuclear material and radioactive substances, including disused IRS (SRS) are established in NP-067-05.

The control of timely return of SRS 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.

The accounting for ionizing radiation sources in the system for the state control and accounting of radioactive substances and RW starts from the moment of receipt of the sources at
the manufacturer’s store of produced items till the moment of disposal (re-categorizing into RW) and placing them into storage (disposal). With that, all transfers of sources between enterprises are put on record.

The SRS, which assigned service life has expired, are subject to writing off as radioactive substances with re-categorized to RW, relevant entries being made to the Radioactive Substances Receipt-Release Log and the RW Accounting Log and formalizing a relevant record, or their service life is extended with a related entry being made to the Radioactive Substances Receipt-Release Log. An individual source is the accounting unit for control and accounting of RW represented by SRS exhausted their assigned lives.

In case the receiving organization reveals through a cross-check of the supplying organization data a loss or theft or unauthorized use, or a lack (excess) of SRS, it should inform on that the relevant controlling bodies within the state system for control and accounting of radioactive substances and RW (a federal-level body for controlling the state system for control and accounting, a regional-level body for controlling the state system for control and accounting, an institutional-level body for controlling the state system for control and accounting), the state safety regulatory body in the field of use of atomic energy which supervises the state system for control and accounting of radioactive substances and RW within 24 hours upon revealing the above facts.

An organization should effect and maintain a system of measures aimed at ensuring the keeping of SRS and URS records during 10 years after SRS and unsealed radiation sources were put under the category of RW or transferred to other organizations.

The RS and RW control and accounting personnel should have required competence and do training as to implementation of procedures for RS and RW control and accounting.

According to Decree of the Government of the Russian Federation No 1298, the SC Rosatom controls the state system for control and accounting of radioactive substances and radioactive waste.

In the Russian Federation Rostechnadzor controls safety of IRS management.

Rostechnadzor licenses activities associated with IRS management, controls compliance with licensing requirements and adopts legal regulatory acts.

At the present time, the organizations are subject to informative procedure as regards transfers of sources. With that, both the supplier of the source (after the off-shipment) and recipient (after the receipt) should provide the related information.

Transportation and storage (disposal) of disused SRS is performed by specialized organizations, which have licenses issued by 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 SRS, including RTG, is performed in frames of the international cooperation, including that with the IAEA.
Section K. Planned Activity in Safety Enhancement

For the purposes of implementing "Fundamentals of the State Policy in the Area of Ensuring Nuclear and Radiation Safety of the Russian Federation for the Period of Up to 2010 and Beyond", the FTP NRS was approved (Decree of the Government of the Russian Federation No 444 of 13 July 2007).

The programmatic objective is to comprehensively solve nuclear and radiation safety problems in the Russian Federation associated with SNF and RW management, decommissioning of nuclear and radiation hazardous facilities, improvement of systems which are necessary for ensuring and controlling nuclear and radiation safety.

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

- to adopt the federal law on radioactive waste management;
- to develop and adopt the state concept for SNF management;
- to develop a draft federal law on SNF management;
- to develop a draft federal law on decommissioning of nuclear facilities;

The issues related to the planned activities to enhance safety are described in more detail in the corresponding sections on SNF and RW management safety.
### Section L. Appendices

#### Appendix B1. SNF Management and Reprocessing

**SNF of Russian reactors**

*Table B1.1. SNF locations*

<table>
<thead>
<tr>
<th>Location</th>
<th>Facility type</th>
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<tbody>
<tr>
<td><strong>NPP</strong></td>
<td></td>
</tr>
<tr>
<td>Kola NPP</td>
<td>WWER-440</td>
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<td>Novovoronezh NPP</td>
<td>WWER-440</td>
</tr>
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<td>WWER-1000</td>
</tr>
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<td>Balakovo NPP</td>
<td>WWER-1000</td>
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<td>Volgodonsk NPP</td>
<td>WWER-1000</td>
</tr>
<tr>
<td>Kalinin NPP</td>
<td>WWER-1000</td>
</tr>
<tr>
<td>Kursk NPP</td>
<td>RBMK-1000</td>
</tr>
<tr>
<td>Leningrad NPP</td>
<td>RBMK-1000</td>
</tr>
<tr>
<td>Smolensk NPP</td>
<td>RBMK-1000</td>
</tr>
<tr>
<td>Beloyarsk NPP</td>
<td>BN-600</td>
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<tr>
<td>Bilibino NPP</td>
<td>AMB</td>
</tr>
<tr>
<td></td>
<td>EGP-6</td>
</tr>
<tr>
<td><strong>NFC</strong></td>
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</tr>
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<td>PA Mayak</td>
<td>WWER-440, AMB</td>
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<td>MCC</td>
<td>WWER-1000</td>
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<tr>
<td><strong>RR</strong></td>
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<td>MR</td>
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<td>IRT</td>
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<td>SSU TPU SRI NF</td>
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<td><strong>NPI</strong></td>
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<tr>
<td>MSC, FMB Lotta</td>
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<tr>
<td>Container storage of icebreaker SNF</td>
<td>Storage</td>
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### Table B1.2. Quantities of SNF of different types of reactors at the enterprises, as of 01.01.2008

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<th>Facility</th>
<th>Fuel type</th>
<th>SNF quantity, metric tons</th>
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<td>WWER-1000</td>
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<td>WWER-1000</td>
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<td>MCC</td>
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<td>MSC, FMB Lepse</td>
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<td>639**</td>
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<td>3,768**</td>
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<td>MSC, FMB Imandra</td>
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* uranium metal,
** the number of stored irradiated fuel assemblies.
### Table B1.3. List of RW reprocessing facilities

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<thead>
<tr>
<th>Facility type</th>
<th>Bituminization</th>
<th>Vitrification</th>
<th>Compaction</th>
<th>Incineration</th>
<th>LRW clean-up</th>
<th>Cementation</th>
<th>Melting</th>
<th>Fragmentation</th>
<th>Decontamination</th>
<th>Other technologies</th>
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<td>FSUE MosSPA Radon</td>
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<td>SRW ILW LLW</td>
<td>LRW SRW ILW LLW</td>
<td>LRW ILW LLW</td>
<td>LRW ILW LLW</td>
<td>LRW SRW ILW LLW</td>
<td>SRW ILW LLW</td>
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<td>High-temperature reprocessing RW LLW</td>
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<td>SRW LRW ILW LLW</td>
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<td>LRW LLW</td>
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<td>Petersburg Ins. Of Nucl. Phys. RAS</td>
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<td>Evaporation, ion-exchange filters LRW ILW LLW</td>
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<tr>
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<tr>
<td>SUE SPA Radium Institute</td>
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<td>FSUE NIKIMT</td>
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<td>Facility type organization</td>
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<td>Other technologies</td>
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<td>FSUE PA &quot;Mayak&quot;</td>
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<td>SRW ILW LLW</td>
<td>SRW LRW ILW LLW</td>
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<tr>
<td>Beloyarsk NPP</td>
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<td>SRW LRW ILW LLW</td>
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<td>SRW ILW LLW</td>
<td>SRW LRW LLW</td>
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</tbody>
</table>

- **LRW clean-up**: Ion exchange LRW LLW; membrane LRW ILW LLW; centrifuge LRW ILW LLW
- **Cementation**: LRW SRW
- **Melting**: Non-ferrous metals SRW LLW
- **Fragmentation**: SRW LLW, Scrap metal SRW LLW
- **Decontamination**: SRW ILW LLW
- **Other technologies**: Liming of LRW

- **Balakovo NPP**: Evaporation LRW 5·10^3 Ci/l
- **Beloyarsk NPP**: Evaporation LRW 5·10^3 Ci/l; LRW ion-selective clean-up
| Facility type organization | Bitumini- 
|zation | Vitrifica- 
|tion | Com- 
|paction | Incinera- 
|tion | LRW clean-up | Cementa- 
|tion | Melting | Fragmenta- 
|tion | Deconta- 
|mination | Other 
|technologies |
|---|---|---|---|---|---|---|---|---|---|
| Kursk NPP | | | | | | | | | |
| Leningrad NPP | SRW LRW ILW LLW | SRW ILW LLW | SRW ILW LLW | Evaporation LRW 5·10⁻³ Ci/l | LRW 5·10⁻³ Ci/l | Metal SRW LLW; heat-insulation RW LLW | | BAC coal reprocessing, SRW |
| Novovoronezh NPP | | | | | | | | | |
| Smolensk NPP | | | | | | | | | |
| Obninsk NPP | | | | | | | | | |
| FSUE Atomflot | SRW ILW LLW | SRW ILW LLW | | LRW LLW; centrifuge LRW ILW LLW | LRW LLW | | | |
| JSC SPE Ecoatom | | | | | | | | | |
| JSC Ecomet-S | | | | | | | | | |
| JSC MSZ | SRW LLW | | | | | Scap metal SRW LLW | | Liming of LRW |
| JSC CMP | SRW LLW | | | | | SRW LLW | | Liming of LRW |
### Table B1.4. List of NI under decommissioning

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<th>Year of shutdown</th>
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<td>VVRL-03</td>
<td>2003</td>
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<td>AM-1</td>
<td>1999</td>
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<tr>
<td>FSUE NITI named after A.P. Alexandrov</td>
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<td>1999</td>
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<td></td>
<td>APL 27/VM</td>
<td>1986</td>
</tr>
<tr>
<td></td>
<td>APL 27/VT</td>
<td>1976</td>
</tr>
<tr>
<td></td>
<td>VAU-6s</td>
<td>2004</td>
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<tr>
<td>RRC Kurchatov Institute</td>
<td>MR</td>
<td>1993</td>
</tr>
<tr>
<td><strong>NFC Enterprises</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JSC Chemical and Metallurgical Plant</td>
<td>Dioxide uranium powder production</td>
<td>2008</td>
</tr>
</tbody>
</table>

### Appendix B2. RW generation

#### Table B2.1. LRW generation in 2007

<table>
<thead>
<tr>
<th>Total LRW</th>
<th>Volume</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.2 mln m³ – 100%</td>
<td>1.7·10¹⁸ Bq – 100%</td>
</tr>
<tr>
<td>LLW</td>
<td>95.7%</td>
<td>0.04%</td>
</tr>
<tr>
<td>ILW</td>
<td>4.1%</td>
<td>15.1%</td>
</tr>
<tr>
<td>HLW</td>
<td>0.2%</td>
<td>84.86%</td>
</tr>
</tbody>
</table>

#### Table B2.2. SRW generation in 2007

<table>
<thead>
<tr>
<th>Total SRW</th>
<th>By mass</th>
<th>Nuclear industry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.19 mln t (100%)</td>
<td>By activity 2.69·10¹⁶ Bq (100%)</td>
</tr>
<tr>
<td>LLW</td>
<td>99.77%</td>
<td>0.07%</td>
</tr>
<tr>
<td>ILW</td>
<td>0.14%</td>
<td>0.68%</td>
</tr>
<tr>
<td>HLW</td>
<td>0.09%</td>
<td>99.25%</td>
</tr>
</tbody>
</table>
Appendix E. Information on the Principal Legal Documents

Appendix 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.

### 1. Principal International Agreements of the Russian Federation

<table>
<thead>
<tr>
<th>No.</th>
<th>Title of the document</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>International Convention for the Safety of Life at Sea</td>
<td>1965</td>
</tr>
<tr>
<td>2</td>
<td>Convention on Early Notification of a Nuclear Accident</td>
<td>1986</td>
</tr>
<tr>
<td>3</td>
<td>Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency</td>
<td>1986</td>
</tr>
<tr>
<td>4</td>
<td>Convention on the Physical Protection of Nuclear Material</td>
<td>1987</td>
</tr>
<tr>
<td>6</td>
<td>Convention on Nuclear Safety</td>
<td>1996</td>
</tr>
<tr>
<td>7</td>
<td>Convention on Civil Liability for Nuclear Damage</td>
<td>1996</td>
</tr>
</tbody>
</table>

### 2. Federal Laws of the Russian Federation

<table>
<thead>
<tr>
<th>No</th>
<th>Title of the document</th>
<th>Registration No. and the year when the document was signed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>On the use of atomic energy, with amendments and supplements</td>
<td>No.170-FL of November 21,1995</td>
</tr>
<tr>
<td>2</td>
<td>On the subsoil resources, with amendments and supplements</td>
<td>No. 2395-1 of February 21, 1992</td>
</tr>
<tr>
<td>3</td>
<td>On ratification of the joint convention on the safety of spent fuel management and the safety of radioactive waste management</td>
<td>No139-FL of November 04, 2005</td>
</tr>
<tr>
<td>4</td>
<td>On assuring uniformity of measurements</td>
<td>No. 4871-1p of April 27, 1993</td>
</tr>
<tr>
<td>5</td>
<td>On the protection of the population and territories against emergencies of natural and man-caused origin</td>
<td>No.68-FL of December 21, 1994</td>
</tr>
<tr>
<td>6</td>
<td>On fire safety, with amendments</td>
<td>No.69-FL of December 21, 1994</td>
</tr>
<tr>
<td>8</td>
<td>On environmental review, with amendments</td>
<td>No.174-FL of November 23, 1995</td>
</tr>
<tr>
<td>No</td>
<td>Title of the document</td>
<td>Registration No. and the year when the document was signed</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------</td>
</tr>
<tr>
<td>9.</td>
<td>On radiation safety of the population</td>
<td>No.3-FL of January 9, 1996</td>
</tr>
<tr>
<td>10.</td>
<td>On financing of specially radiation hazardous and nuclear hazardous production enterprises and facilities</td>
<td>No.29-FL of April 3, 1996</td>
</tr>
<tr>
<td>11.</td>
<td>On industrial safety of hazardous production facilities, with amendments and supplements</td>
<td>No.116-FL of July 21, 1997</td>
</tr>
<tr>
<td>12.</td>
<td>On safety of hydraulic facilities, with amendments and supplements</td>
<td>No.117-FL of July 21, 1997</td>
</tr>
<tr>
<td>13.</td>
<td>On counteracting terrorism</td>
<td>No.35-FL of March 06, 2006</td>
</tr>
<tr>
<td>14.</td>
<td>On sanitary and epidemiological well-being of the population, with amendments and supplements</td>
<td>No.52-FL of March 30, 1999</td>
</tr>
<tr>
<td>15.</td>
<td>On departmental guards, with amendments and supplements</td>
<td>No.77-FL of April 14, 1999</td>
</tr>
<tr>
<td>16.</td>
<td>On special ecological programs of remediation of territories with radioactive contamination</td>
<td>No.92-FL of July 10, 2001</td>
</tr>
<tr>
<td>18.</td>
<td>On the environmental protection</td>
<td>No 7-FL of January 10, 2002</td>
</tr>
<tr>
<td>19.</td>
<td>On the technical regulation</td>
<td>No 184-FL of December 27, 2002</td>
</tr>
<tr>
<td>20.</td>
<td>On the licensing of certain activities</td>
<td>No 128-FL of August 08, 2001</td>
</tr>
<tr>
<td>24.</td>
<td>Technical regulation on fire safety requirements (to enter into force nine months after its official publication)</td>
<td>No 123-FL of July 22, 2008</td>
</tr>
<tr>
<td>25.</td>
<td>Regarding features of the management and disposition of property and stock of the organizations which carry out activities in the field of use of atomic energy, and regarding the amendment of certain legislative acts of the Russian Federation</td>
<td>No 13-FL of February 05, 2007</td>
</tr>
</tbody>
</table>
### 3. Decrees and Orders of the President of the Russian Federation

<table>
<thead>
<tr>
<th>No.</th>
<th>Title of a decree or an order</th>
<th>Registration number and the date of a decree or an order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>On the control of export from the Russian Federation of nuclear material, equipment and production technologies</td>
<td>No.312, March 27, 1992</td>
</tr>
<tr>
<td>2.</td>
<td>On the operating organization of nuclear power plants of the Russian Federation</td>
<td>No.1055, September 7, 1992</td>
</tr>
<tr>
<td>3.</td>
<td>On the fulfillment by the Russian Federation of intergovernmental agreements on cooperation in construction of nuclear power plants abroad</td>
<td>No.472, April 21, 1993</td>
</tr>
<tr>
<td>4.</td>
<td>On the state support of the restructuring and conversion of nuclear industry in the city of Zheleznogorsk of Krasnoyarsk Territory</td>
<td>No.72, January 25, 1995</td>
</tr>
<tr>
<td>5.</td>
<td>On the complementary measures to enhance the control of the fulfillment of the requirements of ecological safety in spent nuclear fuel reprocessing</td>
<td>No. 389, April 20, 1995</td>
</tr>
<tr>
<td>6.</td>
<td>On the perfection of the management of the enterprises of nuclear fuel cycle</td>
<td>No.166, February 8, 1996</td>
</tr>
<tr>
<td>7.</td>
<td>On the approval of the List of nuclear material, equipment, special non-nuclear material and relevant production technologies, subject to export control</td>
<td>No.202, February 14, 1996</td>
</tr>
<tr>
<td>8.</td>
<td>The scope of the Ministry of the Russian Federation of civil defense issues, emergency situations and elimination of the consequences of natural disasters</td>
<td>No.953, August 2, 1999</td>
</tr>
<tr>
<td>9.</td>
<td>On the perfection of state management in the area of fire safety</td>
<td>No.1309, November 9, 2001</td>
</tr>
<tr>
<td>11.</td>
<td>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</td>
<td>No. 858, July 31, 2003</td>
</tr>
<tr>
<td>12.</td>
<td>On the restructuring of the nuclear power and industry complex in the Russian Federation</td>
<td>No 556 of April 27, 2007</td>
</tr>
<tr>
<td>14.</td>
<td>On issues of the system and structure of the federal executive bodies</td>
<td>No 724 of May 12, 2008</td>
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</table>
### 4. Decrees of the Government of the Russian Federation

<table>
<thead>
<tr>
<th>No.</th>
<th>Title of a decree or an order</th>
<th>Registration number and the date of a decree or an order</th>
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<tbody>
<tr>
<td>1.</td>
<td>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</td>
<td>No. 505, July 22, 1992</td>
</tr>
<tr>
<td>2.</td>
<td>On the measures for comprehensive resolving the problems of management of radioactive waste and cessation of disposal of RW into the seas</td>
<td>No. 710, July 23, 1993</td>
</tr>
<tr>
<td>3.</td>
<td>On the approval of the Status of State environmental review</td>
<td>No. 942, September 22, 1993</td>
</tr>
<tr>
<td>4.</td>
<td>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</td>
<td>No. 773, July 29, 1995</td>
</tr>
<tr>
<td>5.</td>
<td>On the approval of the List of organizations operating especially radiation hazardous and nuclear hazardous production facilities and objects</td>
<td>No. 2186-r, December 9, 2005</td>
</tr>
<tr>
<td>6.</td>
<td>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</td>
<td>No. 291, March 16, 1996</td>
</tr>
<tr>
<td>7.</td>
<td>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”</td>
<td>No. 677, June 11, 1996</td>
</tr>
<tr>
<td>8.</td>
<td>On the approval of the Regulation on the routine of performing state ecologic review</td>
<td>No. 698, June 11, 1996</td>
</tr>
<tr>
<td>9.</td>
<td>On the routine for the development of radiation hygiene certificates (”passports”) of organizations and territories</td>
<td>No. 93, January 28, 1997</td>
</tr>
<tr>
<td>10.</td>
<td>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</td>
<td>No. 240, March 3, 1997</td>
</tr>
<tr>
<td>11.</td>
<td>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”</td>
<td>No. 289, March 12, 1997</td>
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<tr>
<td>13.</td>
<td>Regarding funding of decommissioning of nuclear installations, radiation sources, storage facilities for nuclear materials, radioactive substances and radioactive waste and of research and development to justify and improve safety of these facilities</td>
<td>No 367, April 02, 1997</td>
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<td>14.</td>
<td>On the approval of the Regulation on licensing of activities in the area of atomic energy use</td>
<td>No. 865, July 14, 1997</td>
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<tr>
<td>17.</td>
<td>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</td>
<td>No. 1511, December 1, 1997</td>
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<tr>
<td>18.</td>
<td>On approval of the Provisions for the state control and accounting of nuclear material</td>
<td>No. 352, May 06, 2008</td>
</tr>
<tr>
<td>19.</td>
<td>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</td>
<td>No. 1117, September 15, 1998</td>
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<tr>
<td>20.</td>
<td>On the approval of the Regulations of declaring safety of hydraulic structures</td>
<td>No. 1303, November 6, 1998</td>
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<tr>
<td>22.</td>
<td>On the measures to counteract terrorism</td>
<td>No. 1040, September 16, 1999</td>
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<td>23.</td>
<td>On the approval of the Regulations on social-hygienic monitoring</td>
<td>No. 426, June 1, 2000</td>
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<td>24.</td>
<td>On organizing of departmental guarding</td>
<td>No. 514, July 12, 2000</td>
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<tr>
<td>25.</td>
<td>On the approval of the Regulations on state sanitary-epidemiologic service and the Regulations on state sanitary-epidemiologic normalization</td>
<td>No. 554, July 24, 2000</td>
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<tr>
<td>26.</td>
<td>On export and import of nuclear material, equipment, special non-nuclear material and relevant production technologies</td>
<td>No. 973, December 15, 2000</td>
</tr>
<tr>
<td>27.</td>
<td>On the routine of executing state review and approval of town-planning, preproject and project documentation</td>
<td>No. 1008, December 27, 2000</td>
</tr>
<tr>
<td>28.</td>
<td>On state competent authority on nuclear and radiation safety in transportation of nuclear material, radioactive substances and items made thereof</td>
<td>No. 204, March 19, 2001</td>
</tr>
<tr>
<td>29.</td>
<td>On the approval of the Statute of the Federal Environmental, Industrial and Nuclear Supervision Service</td>
<td>No. 401, April 22, 2002</td>
</tr>
<tr>
<td>No.</td>
<td>Title of a decree or an order</td>
<td>Registration number and the date of a decree or an order</td>
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<td>30</td>
<td>On the approval of the Regulation for licensing of transportation of passengers and goods by road</td>
<td>No. 402, June 10, 2002</td>
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<td>31</td>
<td>On the routine of import to the Russian Federation of irradiated fuel assemblies of nuclear reactors</td>
<td>No 418, July 11, 2003</td>
</tr>
<tr>
<td>32</td>
<td>On the unified state system for prevention and elimination of emergencies</td>
<td>No 794, December 30,2003</td>
</tr>
<tr>
<td>33</td>
<td>Provisions for the state supervision in the field of protection of the population and territories against natural and man-induced emergencies to be effected by the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters</td>
<td>No 712, December 01, 2005</td>
</tr>
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<td>34</td>
<td>On the Federal medical and Biological Agency</td>
<td>No 206, 11.04.2005</td>
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<td>35</td>
<td>On approval of provisions for the Federal Consumer Rights and Human Well-Being Supervision Service</td>
<td>No 322, June 30, 2004</td>
</tr>
<tr>
<td>37</td>
<td>On the approval of the Regulation on financing of special ecological programs for remediation of areas of territories with radioactive contamination</td>
<td>No. 588, September 22, 2003</td>
</tr>
<tr>
<td>38</td>
<td>On the approval of the Regulation for the development of special ecological programs for remediation of areas of territories with radioactive contamination</td>
<td>No. 421, July 14, 2003</td>
</tr>
<tr>
<td>39</td>
<td>Regarding the Federal Executive Bodies Exercising the State Control over the Uses of Atomic Energy and the State Regulation of Safety of the Uses of Atomic Energy</td>
<td>No 412, July 03, 2006</td>
</tr>
<tr>
<td>40</td>
<td>On the Federal Target Program &quot;Development of Nuclear Power and Industry Complex of Russia in 2007-2010 and until 2015&quot;</td>
<td>No 605, October 06, 2006</td>
</tr>
<tr>
<td>41</td>
<td>On the procedure and conditions of transfers of the ownership right for nuclear material to a foreign state or foreign legal entity</td>
<td>No 724, October 31, 2007</td>
</tr>
<tr>
<td>43</td>
<td>On engineering surveys to prepare project documentation, construction, and refurbishment of capital construction objects</td>
<td>No 20, January 19, 2006</td>
</tr>
<tr>
<td>44</td>
<td>On composition of sections of the design documentation and requirements to their content</td>
<td>No 87, February 16, 2008</td>
</tr>
</tbody>
</table>
### 5. Federal Norms and Rules in the Field of Use of Atomic Energy, Safety Guides and Guiding Documents of Rostechnadzor

<table>
<thead>
<tr>
<th>No</th>
<th>Document title</th>
<th>Reference number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Radiation Safety Standards</td>
<td>NRB-99</td>
</tr>
<tr>
<td>2.</td>
<td>Basic Sanitary Rules of Radiation Safety</td>
<td>OSPORB-99</td>
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<tr>
<td>4.</td>
<td>Sanitary Rules of Design and Operation of Nuclear Power Plants</td>
<td>SP AS-03</td>
</tr>
<tr>
<td>5.</td>
<td>Fire Safety Rules of the Russian Federation</td>
<td>PPB 01-03</td>
</tr>
<tr>
<td>9.</td>
<td>Provisions on Event Investigation and Recording Procedures at Nuclear Power Plants</td>
<td>NP-004-08</td>
</tr>
<tr>
<td>12.</td>
<td>Rules of Safety at Decommissioning of a NPP Unit</td>
<td>NP-012-99</td>
</tr>
<tr>
<td>17.</td>
<td>Basic Requirements for Life Extension of NPP Unit</td>
<td>NP-017-2000</td>
</tr>
<tr>
<td>18.</td>
<td>Requirements for Contents of Safety Analysis Report of Nuclear Power Plants with Fast Neutron Reactors</td>
<td>NP-018-05</td>
</tr>
<tr>
<td>No</td>
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<tr>
<td>24</td>
<td>Requirements for Justification of Extension of the Assigned Service Life of Nuclear Facilities</td>
<td>NP-024-2000</td>
</tr>
<tr>
<td>25</td>
<td>Provisions on Event Investigation and Recording Procedures at Research Nuclear Installations</td>
<td>NP-027-01</td>
</tr>
<tr>
<td>26</td>
<td>Rules of Safety at Decommissioning of Research Nuclear Installations</td>
<td>NP-028-01</td>
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<td>27</td>
<td>Siting of Nuclear Power Plants. Main Safety Criteria and Requirements</td>
<td>NP-032-01</td>
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<td>29</td>
<td>Dry Storage Facilities for Spent Nuclear Fuel. Safety Requirements</td>
<td>NP-035-02</td>
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<td>30</td>
<td>Rules of Safety at Decommissioning of Ship Nuclear Power Installations</td>
<td>NP-037-02</td>
</tr>
<tr>
<td>31</td>
<td>General safety Provisions of Radiation Sources</td>
<td>NP-038-02</td>
</tr>
<tr>
<td>32</td>
<td>Requirements for Content of Safety Analysis Report of Radiation Sources</td>
<td>NP-039-02</td>
</tr>
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<td>33</td>
<td>Requirements for Quality Assurance Program for Nuclear Fuel cycle Facilities</td>
<td>NP-041-02</td>
</tr>
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<td>34</td>
<td>Requirements for Quality Assurance Program for Research Nuclear Installations</td>
<td>NP-042-02</td>
</tr>
<tr>
<td>35</td>
<td>Requirements for Layout and Safe Operation of Lifting Cranes for Nuclear Facilities</td>
<td>NP-043-03</td>
</tr>
<tr>
<td>36</td>
<td>Provisions on Event Investigation and Recording Procedures at Nuclear Fuel Cycle Facilities</td>
<td>NP-047-03</td>
</tr>
<tr>
<td>37</td>
<td>Requirements for Content of Safety Analysis Report of Research Nuclear Installations</td>
<td>NP-049-03</td>
</tr>
<tr>
<td>38</td>
<td>Siting of Nuclear Installations of Nuclear Fuel Cycle. Basic Safety Criteria and Requirements</td>
<td>NP-050-03</td>
</tr>
<tr>
<td>40</td>
<td>Rules of Safety at Transportation of Radioactive Materials</td>
<td>NP-053-04</td>
</tr>
<tr>
<td>42</td>
<td>Requirements for Quality Assurance Program of Ship Nuclear Power Installations</td>
<td>NP-056-04</td>
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<tr>
<td>43</td>
<td>Safety Rules of Decommissioning of Nuclear Installations of Nuclear Fuel Cycle</td>
<td>NP-057-04</td>
</tr>
<tr>
<td>44</td>
<td>Safety of Radioactive Waste Management. General provisions</td>
<td>NP-058-04</td>
</tr>
<tr>
<td>45</td>
<td>Rules of Safety at Storage and Transportation of Nuclear Fuel on Sites of Nuclear Facilities</td>
<td>NP-061-05</td>
</tr>
<tr>
<td>46</td>
<td>Nuclear Safety Rules for Nuclear Fuel Cycle Facilities</td>
<td>NP-063-05</td>
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<thead>
<tr>
<th>No</th>
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</thead>
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<tr>
<td>47.</td>
<td>Accounting of External Natural and Man-Induced Events to Nuclear Facilities</td>
<td>NP-064-05</td>
</tr>
<tr>
<td>49.</td>
<td>Basic Rules of Control and Accounting of Radioactive Substances and Radioactive Waste in an Organization</td>
<td>NP-067-05</td>
</tr>
<tr>
<td>51.</td>
<td>Rules of Layout and Safe Operation of Equipment and Pipelines of Nuclear Fuel Cycle Facilities</td>
<td>NP-070-06</td>
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<tr>
<td>52.</td>
<td>Rules of Assessment of Conformance of Equipment, Component Parts, Materials and Half-made Products being Supplied to Nuclear facilities</td>
<td>NP-071-06</td>
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<td>Procedure for Supervision over Nuclear and Radiation Safety at Nuclear Power Plants</td>
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<td>Provisions Regarding the Procedure of Granting Permits by Gosatomnadzor of Russia to Employees of the Nuclear Fuel Cycle Enterprises to Work in the Field of Use of Atomic Energy</td>
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<td>Requirements for Composition of the Package and Content of Documents Justifying Nuclear and Radiation Safety of Buildings and Complexes with Research Nuclear Installations and/or Licensed Activities</td>
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Appendix F. Facility Category of Hazard

The categorization of the facilities of potential radiation hazard is introduced by the regulation “Basic Sanitary Rules of Radiation Safety” (OSPORB-99).

**Facility Category of Radiation Hazard**

<table>
<thead>
<tr>
<th>Facility category of radiation hazard</th>
<th>Type of potential radiation hazard of a facility</th>
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<tbody>
<tr>
<td>I</td>
<td>Radiation impact on the population is possible in an accident, measures to protect the population may be required</td>
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<tr>
<td>II</td>
<td>Radiation impact in an accident is limited by the territory of the controlled area</td>
</tr>
<tr>
<td>III</td>
<td>Radiation impact in an accident is limited by the territory of the facility</td>
</tr>
<tr>
<td>IV</td>
<td>Radiation impact in an accident is limited by the premises where the radiation sources are handled</td>
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