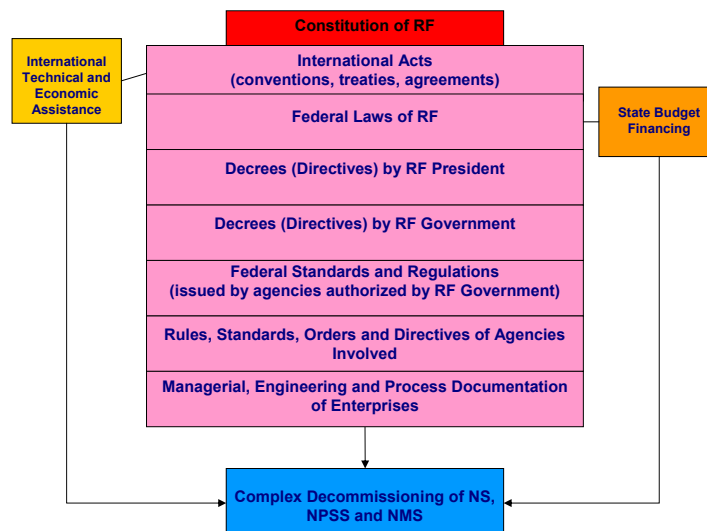


Development of Proposals on Modernization of Legal and Regulatory Framework in the Field of NS Complex Decommissioning and Environmental Rehabilitation of TSF for SNF and RW

(Strategic Study № 8)

Hierarchy of Regulatory and Managerial-Administrative Documentation for Complex Decommissioning and Rehabilitation



**Main Outcomes and Proposals of SMP-1
Concerning Analysis of the Regulatory and Legal Basis for Complex
Decommissioning of Russian Nuclear Fleet**

- I.** On the whole, the existing regulatory and legal basis supports safe conduct of works on complex decommissioning of NS and related international cooperation and complies with international standards and regulations in the field of nuclear and radiation safety.
- II.** The main areas of further improvement of the regulatory and legal basis are :
1. Adoption of new and amendment of several acting legislative acts of RF;
 2. Ratification of the 1998 Joint Convention on the Safety of SNF Management.
 3. Ratification of the Vienna Convention on Civil Liability for Nuclear Damage;
 4. Development of local legislation and regulatory documents of local administrations to provide for tax exemptions associated with the free assistance to Russia.
- III.** In addition to the above lines of improvement of the top-level regulatory and legal basis, the following appears appropriate :
- consider the possibility and appropriateness of establishing a new RW category - Very Low-Level Waste (VLLW);
 - develop and put into action the RW acceptance requirements and criteria for ultimate disposal (refinement of the Sanitary Radioactive Waste Management Regulations - SPORO-2002);
 - formulate criteria of ultimate rehabilitation of former naval bases of the Russian Northern Fleet;
 - clarify and optimize the procedures of interfaces between various regulatory authorities during the process of agreement and approval of project documentation on complex decommissioning and environmental rehabilitation of radiation-hazardous facilities.

Goal of the Study

(in compliance with ToR for SI-8)

**Development of Proposals on Amendment and
Supplement of legal and regulatory acts concerning:**

improvement of the interfaces between the state agencies and the procedure of agreeing of project documentation on complex decommissioning of NS and environmental rehabilitation of TSF for SNF & RW;

introduction of a special category of Very Low-Level Waste (VLLW) (industrial waste containing man-caused radionuclides) to the technical regulations and the federal rules and standards on nuclear and radiation safety;

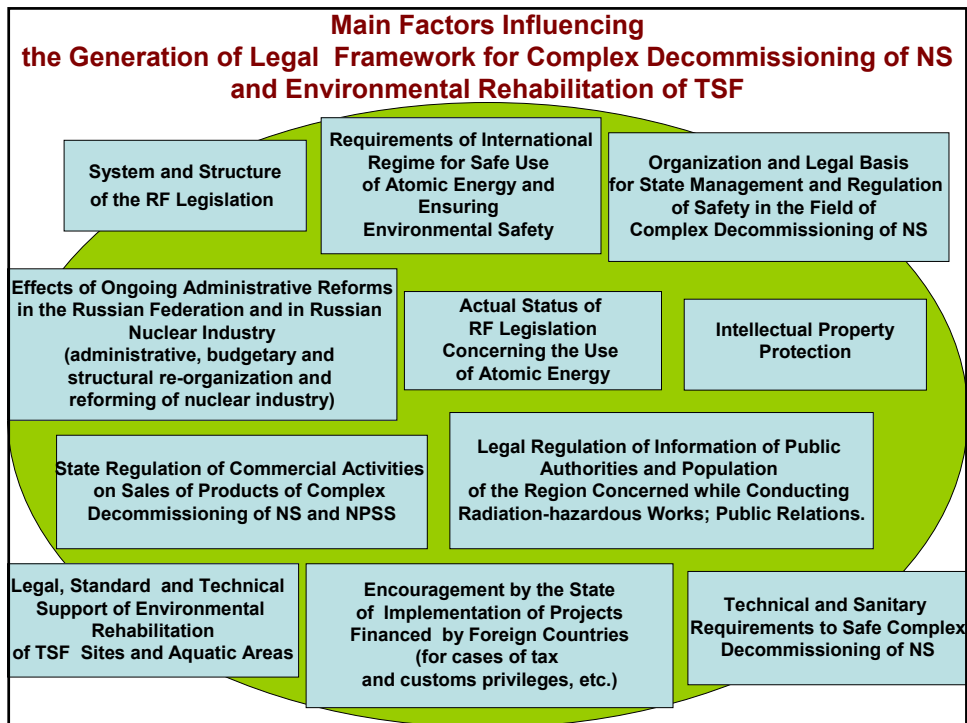
clarification and justification of radiation and sanitary status of reactor compartments required for their long-term storage.

Objectives of the Study

1. **Clarify the list** of regulatory acts supporting efficient implementation of works on complex decommissioning of NS, NPSS, NMS and environmental rehabilitation of the sites of TSF for SNF & RW.
2. **Perform analysis** of the actual legal, regulatory, standard and technical basis regulating the safety of works on complex decommissioning of NS and environmental rehabilitation of TSF to reveal duplications, inconsistencies or lack of necessary standards.
3. **Develop proposals** on introducing amendments and supplements to the regulatory acts, federal rules and standards, and standard-and-technical documents in the field of state regulation of safety in order to:
 - **improve the interfaces between the state safety regulatory authorities while agreeing project documentation on complex decommissioning of NS and environmental rehabilitation of TSF,**
 - **introduce a special RW category - “Very Low-Level Waste” (VLLW) to the regulatory documents,**
 - **clarify and justify the radiation and sanitary status of reactor compartments required for their long-term storage.**

Procedure of clarification of the List of regulatory acts includes:

- Due account of the most important factors influencing the generation of a legal framework for complex decommissioning of NS and environmental rehabilitation of TSF
- Subject structuring of the legal framework in the field of complex decommissioning of NS and environmental rehabilitation of TSF

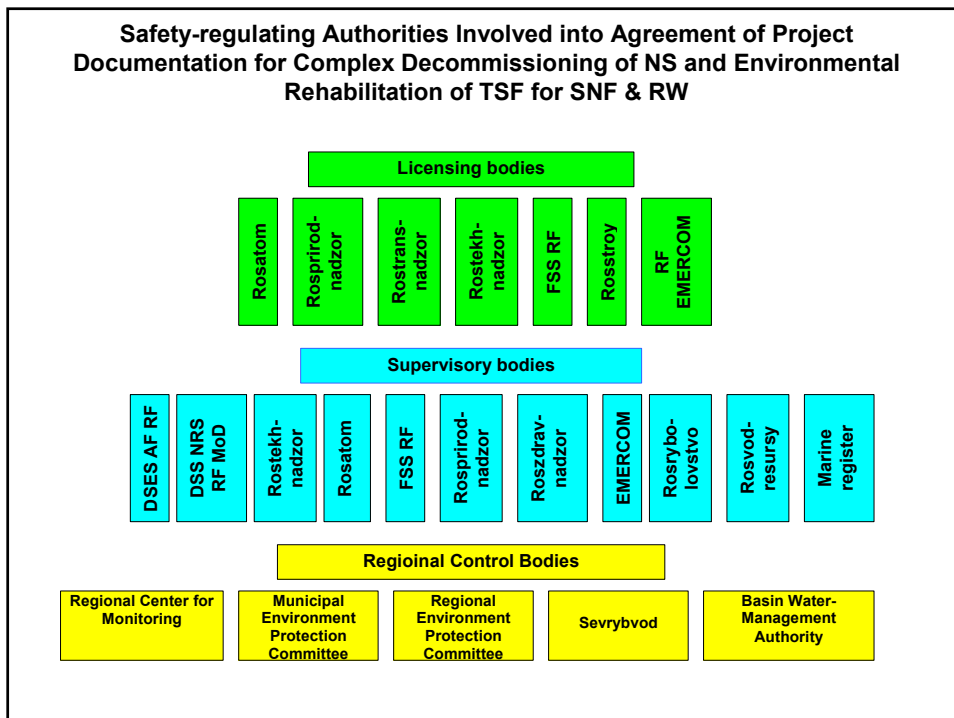


**Subject Structuring of the Legal Framework for
Complex Decommissioning of NS and Environmental Rehabilitation of Territories**

1.	International Regime of Safe Use of Atomic Energy and Ensuring Environmental Safety as Applied to the Complex Decommissioning Processes
	<p>1.1. International agreements on nuclear nonproliferation.</p> <p>1.2. IAEA documents forming the legal basis of safeguards .</p> <p>1.3. Control over nuclear export.</p> <p>1.4. Nuclear material protection, control & accounting.</p> <p>1.5. International regime of counteracting nuclear terrorism and illegal turnover of radioactive materials.</p> <p>1.6. Nuclear ships and ensuring safety of navigation.</p> <p>1.7. Ensuring environmental safety, international environmental programs and initiatives.</p> <p>1.8. Prompt notification of a nuclear accident or a radiation incident and rendering assistance in a case of nuclear accident.</p> <p>1.9. Civil liability for nuclear damage.</p>
2.	State Management and Regulation of Safety for Complex Decommissioning of NS
	<p>2.1. System of federal executive authorities performing public management and regulation of safety in the field of complex decommissioning of NS.</p> <p>2.2. Distribution of powers and co-ordination of activities of the state safety regulatory authorities for complex decommissioning of NS.</p> <p>2.3. Legal status of complex decommissioning objects.</p> <p>2.4. Licensing of main activities in the field of NS decommissioning</p> <p>2.5 Ensuring nuclear, radiation and environmental safety</p> <p>2.6. Ensuring industrial and fire safety.</p> <p>2.7. State control and accounting of nuclear materials, radioactive substances and radioactive waste.</p> <p>2.8. Physical protection of NS complex decommissioning objects.</p> <p>2.9. State control over radiation situation at territories involved into complex decommissioning of NS.</p> <p>2.10. Management of SNF & RW.</p> <p>2.11. Arrangement and construction of complex decommissioning objects.</p> <p>2.12 . State environmental impact assessment.</p>
3.	Technical and Sanitary Requirements to Safe Complex Decommissioning of NS
	<p>3.1. Safety requirements to all phases of NS complex decommissioning.</p> <p>3.2. Safety requirements to individual phases of NS complex decommissioning.</p>
4.	Environmental Rehabilitation of Territories and Aquatic Areas
5	Information of Public Authorities and Population of the Region while Conducting Radiation-Hazardous Works; Public Relations.

Comparative Analysis of the Initial List and the Refined List			
№	Structural elements of the legal framework for complex decommissioning of NS and NPSS	Number of regulatory documents in the <u>initial List</u>	Number of regulatory documents in the <u>new List</u>
1.	Major international agreements of the Russian Federation	8	30
2.	International documents containing recommendations of international organizations, political arrangements on counteracting illegal turnover of radioactive materials and improvement of environmental situation	0	14
3.	Laws of the Russian Federation	31	103
4.	Decrees and directives by RF President	10	34
5.	Decrees and directives by RF Government	43	191
6.	Standard acts of federal executive authorities (including federal rules and standards concerning the use of atomic energy, state standards)	104	457
7.	Agency-level standard acts binding for lower enterprises and organizations (including branch-wise standards, norms, rules, instructions, orders, etc.)	4	142
8.	TOTAL	200	971

A full-text base of documents for Sections 1, 3, 4 and 5 has been generated.



Analysis

of the actual legal, regulatory and technical basis regulating the safety of works on complex decommissioning of NS and environmental rehabilitation of TSF for cases of duplication, inconsistency or lack of requirements, standards, terms and rules **has been performed.**

Proposals

on improvement of legal and regulatory framework for complex decommissioning of NS and environmental rehabilitation of TSF for SNF & RW **have been developed.**

“The acting regulatory acts do not determine explicitly the interfaces between the executive authorities entrusted with public management of the use of atomic energy and the interfaces between the executive bodies authorized in governmental regulation of safety while using atomic energy”.

*Decree № 412 of the RF Government, Clause 2,
July 3, 2006*

A Refined List of standard and regulatory acts regulating the complex decommissioning activities has been compiled:

971 items

A list of Decrees by RF President, decrees and directives by RF Government included into the Refined List and requiring amendments due to ongoing administrative reforms affecting federal executive authorities has been drawn up :

65 items

The necessity of developing **four Federal Laws** to support management of SNF, RW and radioactive materials has been justified.

Specific proposals on introduction of **supplements and amendments** to acts of the **RF Government** have been developed.

Urgent need has been stated for development of **administrative regulations** to support fulfillment by Rosatom of the function of the State Customer – coordinator of complex decommissioning of NS and NPSS and environmental rehabilitation of objects involved into temporary storage of SNF, SRW and LRW.

**Proposals
on Improvement of the Federal Law Base for Complex Decommissioning of NS
And Environmental Rehabilitation of TSF for SNF & RW**

№	Federal Law	Main Idea of Standard Act
1.	On civil liability for nuclear damage and its financial support	Legislative securing of a special regime of civil and legal liability for nuclear damage guaranteeing its indemnification via a special system of financial support.
2.	On radioactive waste management	Legislative securing of basic principles of the State Policy while managing RW, and establishment of an integrated RW-management system in the Russian Federation including the following major elements : <ul style="list-style-type: none"> • state fund for RW management; • management company; • federal and regional facilities for RW long-term storage and disposal; • specialized organizations rendering services on RW processing, conditioning and transportation.
3.	On spent nuclear fuel management	Legislative securing of basic principles of the State Policy while managing SNF, including imported one, taking account of the need for closed nuclear cycle establishment.
4.	On control over turnover of radioactive materials	Generation of a legal basis of the State Policy for turnover and control over turnover of radioactive materials at all phases of their life cycle.

Proposals on Introducing into Standard Documents a Special Category of RW with Minor Radionuclide Concentrations – Very Low-Level Waste (VLLW)

Introduction into RF basic standard documents regulating RW management activities of a category of **Very Low-Level Waste (VLLW)** is proposed. Full name: industrial waste containing minor quantities of man-caused radionuclides – Very Low-Level Waste.

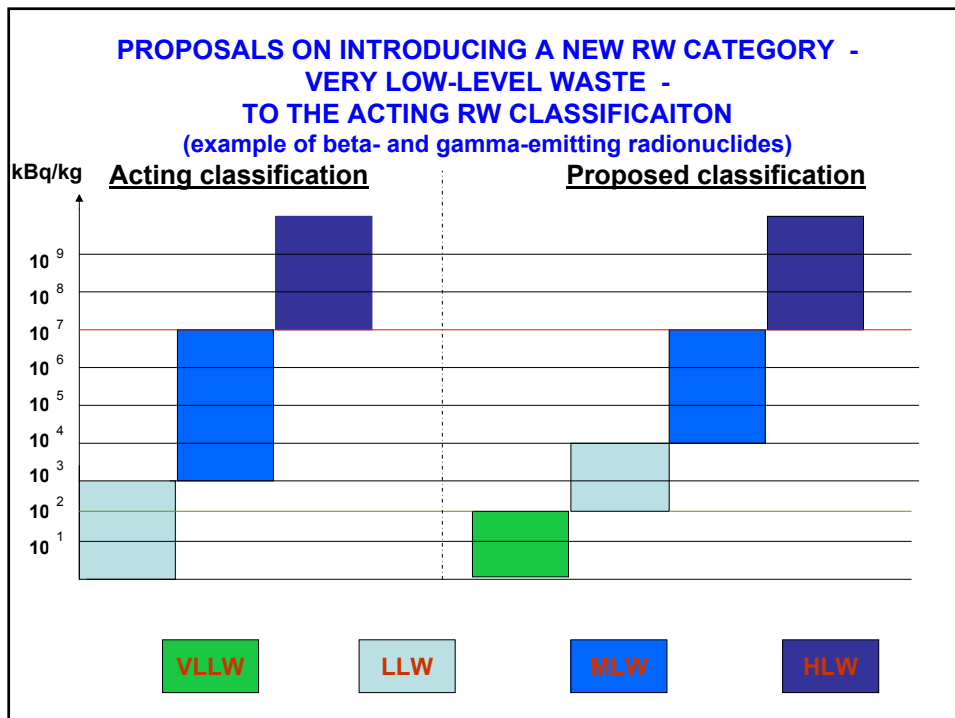
The new RW category shall have specified characteristics. For this purpose the relevant amendments and supplements – the limits of VLLW total specific activity :

- for β and γ -emitting radionuclides from 0.3 to 100 kBq/kg,
- for alpha-emitting radionuclides from 0.3 to 10 kBq/kg;
- for transuranic radionuclides from 0.3 to 1 kBq/kg.

shall be introduced into the following regulations:

1. Basic Sanitary Radiation Safety Regulations (OSPORB-99) Clause №3.12.1
2. Sanitary Radiation Waste Management Regulations (SPORO-2002) Clause № 3.6, 3.8.3.9

For presorting of SRW with unknown radionuclide composition the following criterion of contamination level and gamma dose rate 0.1 m from the surface shall be used provided that the conditions of measurements are observed in accordance with the established procedures : from 0.001 mGy/h to 0.01 mGy/h;



After establishment of the VLLW category the table of classification for liquid and solid RW shall have the following shape:

(values presently in force according to OSPORB-99 are indicated in brackets)

Waste category	Specific activity, kBq/kg			γ -exposure dose rate 0.1 m from surface, μ Gy/h
	Beta- and gamma-emitting radionuclides	Alpha-emitting radionuclides	Transuranic radionuclides	
Very Low-Level Waste (VLLW)	0.3-100	0.3 - 10	0.3 - 1	>1-10
Low-Level Waste (LLW)	10^2 - 10^4 ($<10^3$)	10 - 10^3 ($<10^2$)	1 - 10^2 ($<10^1$)	10 - 10^2
Medium-Level Waste (MLW)	10^4 - 10^7 (10^3 - 10^7)	10^3 - 10^6 (10^2 - 10^6)	10^2 - 10^5 (10^1 - 10^5)	3 - 10^2 - 10^4
High-Level Waste (HLW)	$>10^7$ (10^7)	$> 10^6$ ($> 10^6$)	$> 10^5$ ($> 10^5$)	$> 10^4$

Requirements for Disposal / Interim Storage of VLLW

The following main requirements for VLLW disposal are proposed:

- maximum total specific activity of individual package shall not exceed **300 kBq/kg** for radionuclides with half-life > 5 years;
- maximum specific activity of alpha-emitters (uranium, transuranic elements etc.) with half-life > 5 years in individual RW packages (RW disposal cells) shall not exceed 100 kBq/kg provided that their specific activity on average over RW Disposal Facility (RWDF) does not exceed 10 kBq/kg;
- dose rate on surface of RW package shall not exceed **0.5 mSv/h**;
- period of potential hazard –**200 years at the most** following RWDF closure;
- no compound waste;
- integral total activity - **up to 300 GBq at RWDF**;
- total activity of α -emitters at RWDF – no more than 0.1% of the integral total activity at RWDF;
- RWDF monitoring period - 50 years after closure.

To implement the above requirements, the following regulations shall be amended and supplemented :

- 1. (NP-055-04) Clause №2.5 (Appendix 1)**
- 2. (NP-069-06) Clause №2.3**

Proposed Order for Introduction of a Special Category of Very Low-Level Waste into Standard Documents Regulating the Activities on RW Management and Construction of RW Confinement Facilities

1. Organize discussion of the proposed amendments by Russian experts.
2. Prepare a “Temporary Authorization for RW Management in Andreeva Bay with the Use of the VLLW Category”.
3. Agree the “Temporary Authorization” in Rosatom and obtain approval of the document by the regulatory bodies.
4. Develop “Regulations of Works with VLLW”.
5. Clarify the amount of VLLW in Andreeva Bay.
6. Verify VLLW management experience in practice.
7. Prepare the relevant amendments to technical regulations, federal rules and standards and submit them to the regulatory bodies.

Proposals on Clarification and Justification of the Radiation and Sanitary Status of Reactor Compartments Required for Their Long-Term Storage

Analysis of the terms used in actual standard documents needed for clarification of the radiation-and-sanitary status of reactor compartments of dismantled NS allows the following wording for the term “Reactor Compartment of Dismantled NS”:

“Reactor Compartment (RC) of Dismantled NS is a made up one-compartmental reactor unit with radioactive filing that, in accordance with its constructional and strength properties, falls into the category of ‘closed sources of ionizing radiation’ and is characterized by:

- presence of induced activity of a part of equipment and structural materials;
- presence of immobilized and non - immobilized radioactive contamination of surfaces of RC inner basic structures and remained-in-place individual process units of NPI systems;
- enclosing of solid radioactive waste Categories I and II into RC space;
- correspondence of radiation-hygienic indices with the requirements imposed on radiation - shielding transport packages Category III;
- due radiation protection of personnel, population and environment during RC transportation and storage at land-based long-term storage facility”.

THANK YOU