

Regulatory projects with Rostekhnadzor and SEC-NRS Tacis/INSC Projects

**IAEA CEG Workshop on Management of SNF and RW:
Regulatory and Licensing Issues
(including a special session on Mayak)
St. Petersburg, Russia, 27-28 May 2009**

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1. Tacis/INSC Projects: Regulatory support Lepse

RF/TS/36 (R3.02/00): “Support to Gosatomnadzor in licensing related activities of radioactive waste management in decommissioning of nuclear propelled ships and other vessels with nuclear installations and radiation sources in Northwest Russia”

RF/TS/47 (R3.01/04-2): “Support of licensing activity implemented by the Federal Nuclear Regulatory Authority (Rostekhnadzor) during floating storage radioactive waste management operations - follow-up of RF/TS/36”

- Project started on 19 December 2006, duration 30 months, prolongation till end of 2009
- Inception Meeting in Moscow on 1 March 2007, Final Meeting planned November 2009
- TSOs involved: GRS (Germany), SSM/NRPA (Sweden, Norway), IRSN (France), EnviroS (U.K.) – SEC-NRS (Russian Federation)
- Follow-up was planned for INSC AP 2007 (cancelled)

2. Tacis Project – RF/TS/47

Tasks:

1. Review of Design and Organizational Documentation (DOD) substantiating nuclear and radiation safety
2. Review of working documentation substantiating nuclear and radiation safety
3. Development of regulatory documents (revision of NP-037-02 “Safety Rules for Decommissioning of Ships and Vessels with Nuclear Installations and Radiation Sources”, applicable also for Lepse project)
4. Workshop and Final Technical Report

State at present:

- Task 1: Technical Report ([Technical Recommendations](#)) prepared
- Task 2: Start (was) expected at the end of 2008, new scope of work proposed to the EC, work started
- Task 3: Final version prepared, Approval pending
- Task 4: Workshop held 12-23 May 2008 in UK and Germany

2. RF/TS/47: Task 1 – DoD Review EU-TSOs Technical recommendations

- Independent assessment of the criticality analysis
- SFA break should be properly addressed
- Permissible residual water in the casks for long-term storage
- Analysis of emergency situations to include all other risks not only load falling
- Conditioning of solid waste items inside the structure of the ship sections should be avoided (IAEA recommendations)
- Management of the LRW up to disposal should be more completely addressed
- Waste packaging criteria for the caissons containing radioactive waste for interim long-term storage at Saida Bay should be clarified
- Extraction of fragments and debris of SNF from channels (best solution needs to take account of the operational safety factors but also the proposed long term storage of the radioactive waste including blocks)

Working Documentation -> New Report

Title of the proposed report:

“Analysis and recommendations for the establishment of requirements for storage packages of solid radwaste (ship compartments) for interim storage at the long term interim storage facility at Saida”

Parts of the report (+ recommendations):

1. Analysis of the approved concept on RW management in the North-West of Russia. Interconnection with the Industrial project “Lepse” and “Saida bay” on RW management issues and waste acceptance criteria.
2. Analysis of criteria for RW management of packages to be sent for long-term storage to specialized organizations (storages) in some EU countries.
3. Procedure for preparation of the "Lepse" ship compartments to a state which is acceptable for storage at the RC of Saida bay

2. RF/TS/47: Task 2 New scope of work

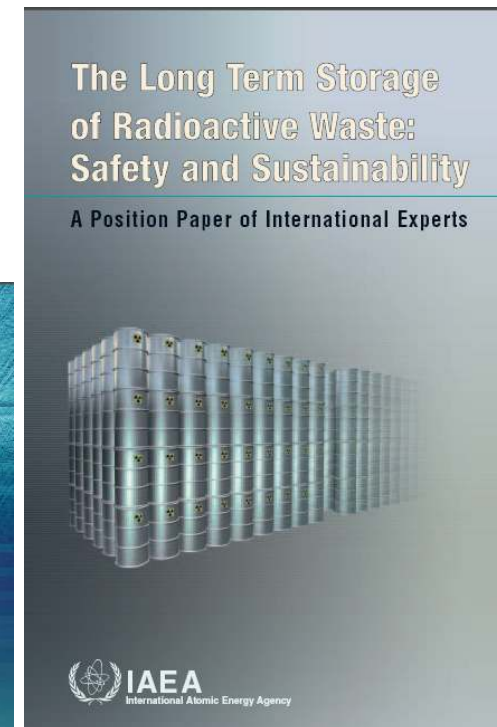
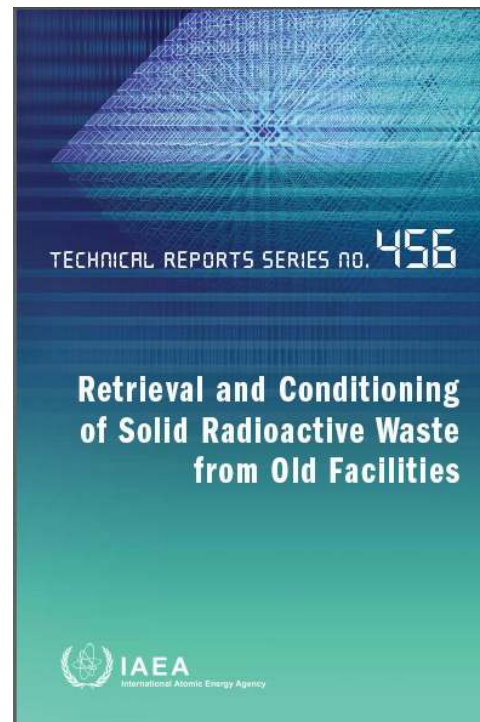
Approach for Recommendations development International recommendations/Experiences

applicable for Lapse blocks:

- IAEA
- WENRA (Safety Reference Levels)
- G8GP Projects
- (NDEP/CEG)

National approaches:

- Sweden/Norway
- France
- Germany - Interim Storage North (ISN)
- Great Britain
- Russian Federation



3. ISN (Greifswald) – Storage of L, I and HLW

Principles:

- **Storage prior to disposal**
- **Spent Fuel 40 years in CASTOR**
- **Storage of conditioned waste according WAC KONRAD**
- **Decay Storage of radwaste**

Licensed :

- **For spent nuclear fuel:**
§ 6 Atomic Energy Act AtG
- **For radioactive waste :**
§ 3 Radiation Protection Ordinance StrlSchV (old version)



Source: <http://www.ewn-gmbh.de/>

3. ISN: WAC for radioactive waste

Waste package characteristics:

- β/γ -emitter contamination on the surface $< 4 \text{ Bq/cm}^2$
- α -emitter (low toxic) contamination on the surface $< 4 \text{ Bq/cm}^2$
- other α -emitter contamination on the surface $< 0.4 \text{ Bq/cm}^2$
- dose rate in distance of 2 m to the surface of the packages max. $100 \mu\text{Sv/h}$

Nuclear Fuel and activity content limitations:

- maximum 15 g nuclear fuel/100 kg in the radioactive waste and
- handling of radioactive residuals and waste in the halls 1-7 and in the conditioning area (caissons 1-4) of the ISN up to an activity of $4,5 \times 10^{17} \text{ Bq}$

Safety Assessment:

- Internal Events: Human induced, fire, loss of media supply
- External Events: earth quake, airplane crash (not required but considered)
- Due to limitation of activity content and protection characteristics of packages and the building no substantial radiological impact

3. ISN: Storage large-size components

Purpose:

- Storage of (not dismantled) large components from decommissioning activities

Advantages:

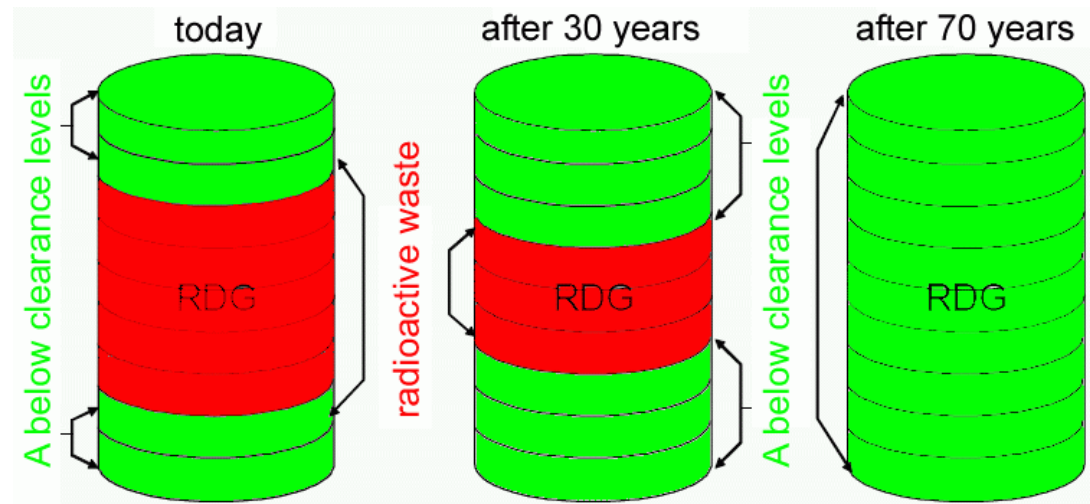
- Simplification of work
- Reduction of the amount of radioactive waste to be disposed off
- Collective Dose reduction
- Cost reduction
- Shortening of the decommissioning project duration

Disadvantages:

- Large investment costs
- Long term operation required
- “Postponed work”



B):	Reaktordruckbehälter
	D/6136/X
	170 000 kg
Bruttomasse : (RDB mit Abschirmung, Ladungssicherung und Wetterschutzplane)	



4. Saida Bay (RF): Storage and Processing

Parts:

- Storage of Reactor compartments (1-3 Start-up complexes - Part 1)
- Storage of other (large) parts like the Lapse blocks (Part 2)
- Treatment and storage centre (Part 3)

Competent authorities:

- MoD (DSS of NRS)
- Ministry of Natural Resources (Rostekhnadzor)
- Ministry of Health and Social Development (FMBA)

What are the requirements for the Lapse blocks?

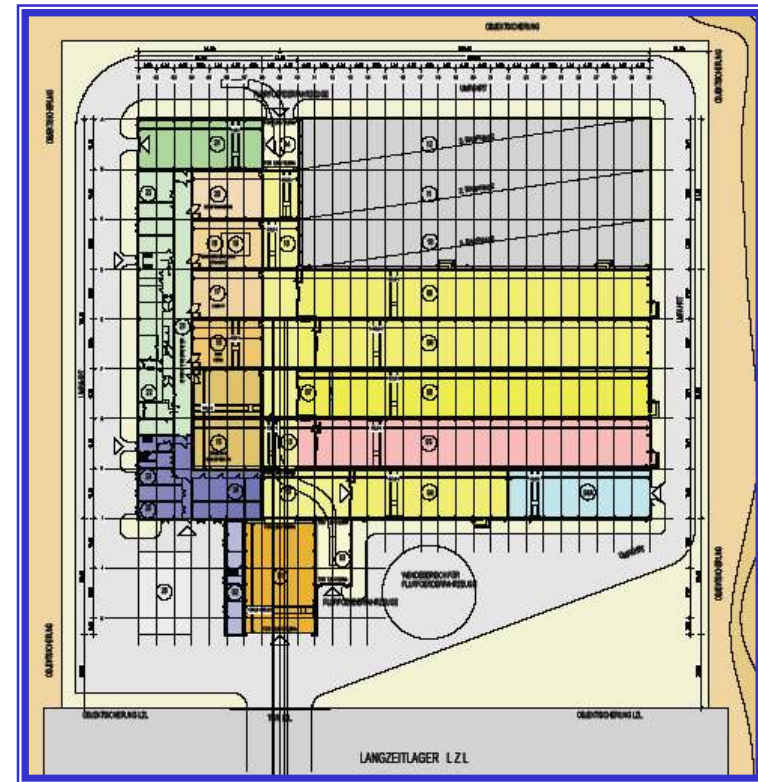


4. Saida RC (RF): Storage and Processing

Functions:

- Acceptance, decontamination, conditioning and packaging of radioactive waste
- Final radiation **measurement for material clearance**
- Storage area for radioactive waste
- Possibility of **final dismantling** of reactor compartments and other radioactive waste and preparation of waste packages

EWN, May 2008



4. Saida RC: Large-size components – draft provisions

Large-sized components or HLW in special overpacks allowed to be stored, if:

- They can be transported at once and
- Further treatment (preparation) of HLW is not required

Preparation and conditioning inside the RC:

- Preparation of waste packages for compliance with RC WAC
- Cutting of equipment (including large-sized components)
- Large-sized components must be fragmented (use of standard containers) if these components are NOT categorized as HLW

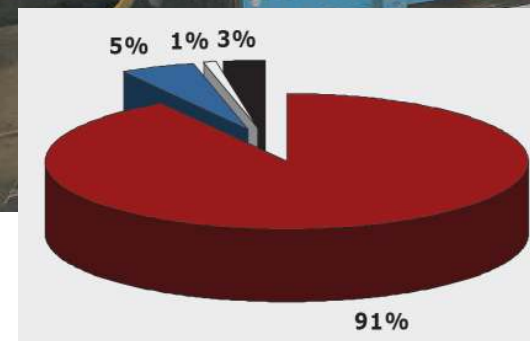
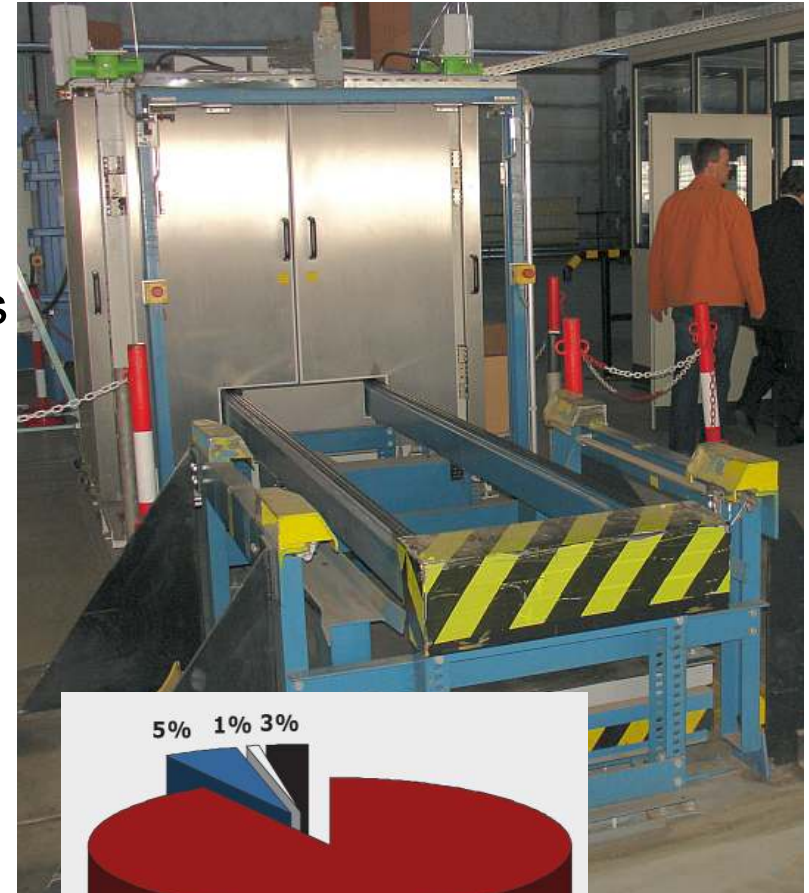
Conclusions for the Lepse blocks - should be designed:

- For the possibility of further transportation and subsequent fragmentation in the RC
- For the possibility to classify them not as HLW (free or limited content of nuclear material)

5. Saida RC: Clearance procedure

Clearance Measurement Facility as a part of the RC:

- Establishment and agreement of a clearance procedure is required
- Based on gross gamma counting therefore the establishment of Standard nuclide shares (vectors) is required
- Legal and regulatory basis need to be adjusted (НРБ-99, ОСПОРБ-99, СПОРО-2002, Law on RAW ...)
- Nuclide mass/surface specific Clearance Levels (CL) have to be established taking into account recommendations of RS-G-1.7 and other related documents
- Clearance only for metals?
- VLLW versus clearance?
- Industrial waste category?



6. Multi- and Bilateral Activities: Interactions of Russian Regulators

Continuation of cooperation work as performed at the Joint Meeting „NRPA/Saida and TACIS/Lepse Regulatory Support Meeting“

- Results of the meeting on 23 March 2009 presented in a protocol
- "Ecological remediation of radiation hazardous installations - Complex decommissioning of Nuclear Submarines - Radioactive Waste Processing - General Technical Requirements" (RD-95-2009) – the document is considered as of high importance
- Further exchange of information envisaged

Outlook:

- Cooperation with Russian regulators and other organisations for the Lepse and other related activities should be continued
- Problems due to cancellation of INSC AP 2007 have to be solved (not only regulatory support but also cooperation with operators was foreseen); AP 2008 is pending
- Other possibilities for financing of activities need to be evaluated